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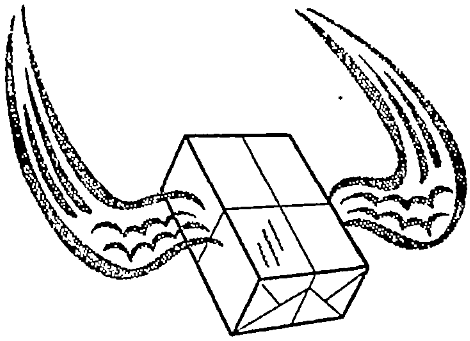

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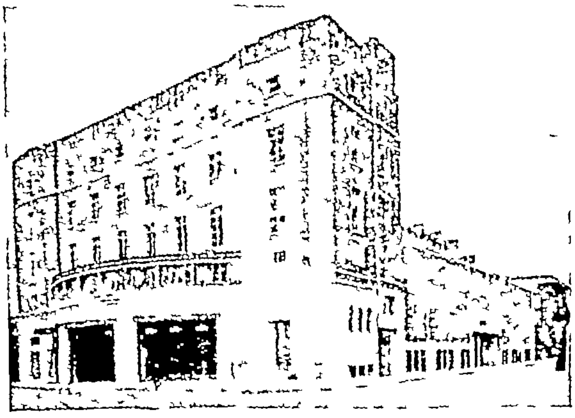

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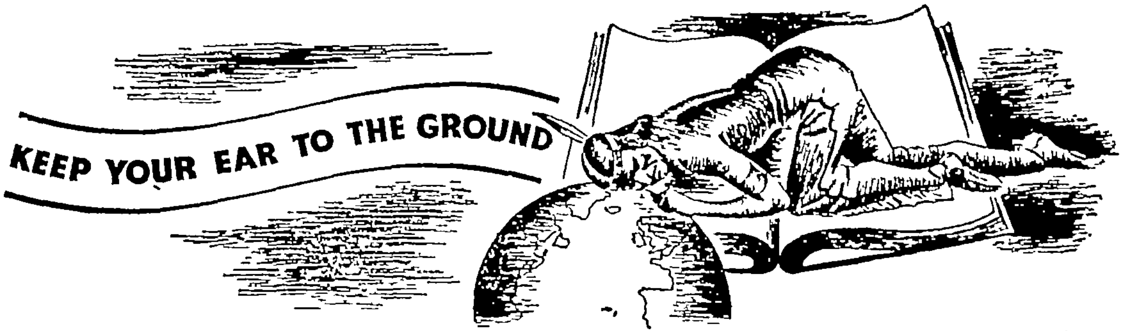
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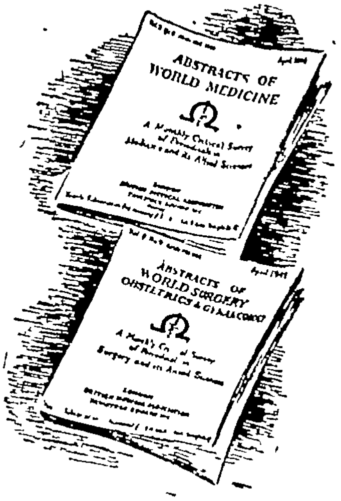
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Sir Heneage Ogilvie

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A SURGEON'S LIFE *

Sir HENEAGE OGILVIE

K.B.E., D.M. Oxfd, F.R.C.S., F.A.C.S., F.R.C.S.C. F.R.A.C.S,

SURGEON TO GUY'S HOSPITAL

WHAT is the life of a surgeon ? How does it differ rom that of a physician ? What characters distinguish he two great branches of medicine, and what circumstances prompt an individual to select one or the other ? Where does the watershed lie that divides the diseases which are the province of the physician from those which are cared for by the surgeon ?

Surgery has been defined as the art of treating injuries and diseases by manual operations. These operations are local manœuvres applied to part of the body only, and they deal almost necessarily with localised trauma or with disease that is local or, if general, demands treatment because of some local manifestation. The main problems presented to the surgeon are the repair of injuries, the setting of fractures, the arrest of hæmorrhage, the closure of wounds ; the treatment of local sepsis by drainage ; the removal of stones, areas of diseased tissues, innocent tumours, or malignant tumours while they are still confined to one part of the body ; the overcoming of obstruction in a natural passage by excision or drainage ; the correction of malformations and deformities ; the redress of overaction in the endocrine or autonomic systems ; the combating of local circulatory failure ; the replacement of defects by grafting ; and the relief of pain by the division of nerves or by the anatomical or functional elimination of its source. Thus surgery offers a considerable variety of tasks, but in this catalogue two common factors can be traced. First, the ailments enumerated are localised not merely in space but in time ; they involve part of a body the rest of which is healthy, and they come as temporary clouds in the sky of a life that has been clear and will be clear again. Secondly, the cure or relief depends largely or entirely on the action of the surgeon himself.

In contrast, the diseases which the physician treats usually affect the whole patient, either directly or indirectly, by the effect of the local lesion on his health, and they affect him not transitorily but for long periods, often for the rest of a life that they are destined to terminate prematurely. In the medical wards we find generalised infections by virus, bacteria, or parasites ; chronic and progressive failure of the digestive, absorptive, excretory, respiratory, or circulatory systems ; widespread damage due to the action of exogenous or endogenous toxins ; congenital and often hereditary maldevelopments of organs, systems, or tissues ; endocrine imbalance ; deficiency diseases ; and degenerative processes. There is little active that the physician can do towards the cure of these sufferers, though the advances in specific chemotherapy have given him a measure of control over some of the acute infections. He can by the prescription of rest and diet help the natural tendency of healthy tissues to fight their own battles, but too often his task is limited to that of the investigator and pinner of labels, the spectator of a losing battle in which he cannot help, the dispenser of encouragement that can cheer but cannot cure.

The medical ward is as cheerful as planned surroundings and the efforts of the nurses can make it, but the prevailing note is one of sympathy rather than optimism. In contrast the surgical ward is a cheerful and even a boisterous place. The patients look forward to an early return to their homes in better condition than when they arrived, and meanwhile do what they can to show their gratitude by helping in the ward and cheering up the lonely or apprehensive newcomer.

Surgery thus attracts the man whose interest in medicine is humanitarian rather than scientific, who loves his fellow men, who wishes to help them and to see that his help is effective. It appeals to the craftsman who enjoys the use of his hands, to the artist whose mind works on visual images, to the romantic who enjoys the drama of life, particularly when it affords him the opportunity to play a decisive rôle, to the extrovert. The president of the residents, the footballer, the mountaineer, the yachtsman, are drawn instinctively towards the surgical side of practice. The prizewinner, the editor of the hospital journal, the debater, the naturalist, tend to find their vocation in medicine.

PERSONAL RESPONSIBILITY

Entered on his chosen work, the surgeon finds those qualities that brought him into surgery further developed by its exercise. Because his patients, for the most part, suffer from local lesions of recent development that have not affected their general health or been accepted by them as part of their environment, he is consulted more urgently, more personally, than the physician. His help is needed as a friend and his advice as a counsellor, almost as much as his opinion is sought as an expert.

The guiding circumstance of a surgeon's life is personal responsibility. He is in charge, he must make decisions and initiate or carry out the line of action those decisions imply, and on the correctness of his decisions and the skill and determination with which the action is carried out depends the welfare and possibly the life of his patient. All the material for a correct diagnosis may not be available, at any rate at a particular time, but there must always be a decision ; even though it may not be the right one it is the best that can be made at the time and the one on which action must be based if action is needed.

A surgeon conducting a difficult case is like the skipper of an ocean-going racing yacht. He knows the port he must make, but he cannot foresee the course of the journey. He must be guided as he goes by changes of wind and weather, he must constantly seek help from the barometer, the lead, the look of the sky, the B.B.C. weather forecast, and he must plan his course not so much to give the most direct journey as at all stages to avoid possible dangers. At every point he must know how far he has travelled, where he is, and the limits of error within which his projected position may lie ; what dangers and difficulties lie immediately ahead ; and how soon he may expect to make port. At every stage he must have a plan, based on a working knowledge of his present position, that will allow him to make for the best of several available harbours should things go wrong, or if none is suitable he must know where to find temporary refuge under the lee of the land till he can resume his journey.

The physician's task is more comparable to that of the golfer. He may know the course and the hole he is playing from long familiarity, or he may for the first time be playing a difficult dog-leg hole on a strange course. If he judges the direction and the wind right, estimates each lie correctly, finds the right club for each shot and uses it skilfully, he will get a bogie or a birdie. If he makes a mistake he will make a poor score, but will get there in the end. The ground will not split beneath his feet, the game will not change suddenly from golf to bull-fighting. The ball may be lost, but that is a way balls have on rough courses.

In urgent surgery, particularly that of abdominal emergencies, the surgeon is constantly being called on for decisions based on his estimate of the probable course of events rather than on demonstrable facts and an unequivocal diagnosis. He must often ask himself which

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* Rutherford Morison lecture delivered at Newcastle on May 5.

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enterprise of one man or a group of men, but it tends to be perpetuated by men of a different type. It is against the closed shop, designed to keep the privileges and emoluments of practice to those within the fold, removing its recruits at an early age from the competitive struggle of general medicine and surgery, and tending therefore to attract men in search of safety and an assured income rather than of adventure and discovery, that criticism must be levelled.

But specialisms are not all subdivisions either of medicine or of surgery. There are branches of practice, of which gynæcology, ophthalmology, and otolaryngology are the best examples, in which medicine and surgery are equally blended, and in which physiology becomes more important than anatomy. In surgery one-system specialisms are developing apace. The neurosurgeon is now a neurologist; the thoracic surgeon is an expert at physical signs and the interpretation of radiograms, a student of the physiology of the circulatory and respiratory systems, and a physician skilled at their disorders. The gastric and the proctological surgeons are tending more and more to be their own physicians. They are in one sense becoming more specialised, in another more general. Which way does advance lie?

Medicine as a whole is too vast for the grasp of any one individual. Specialism is inevitable, and having accepted it we must examine its limitations. The essential and inescapable one is that a specialist is expert for one purpose only. A specialist alone can be supremely efficient, and the earlier he devotes himself to a particular branch of study, the smaller that branch, and the more single-minded the devotion with which he studies it, the more efficient will he be in that branch and that alone. But disease is no specialist. Patients do not consult us because certain organs are affected, but because they feel ill. They come with symptoms, and the earlier and therefore the more curable their malady is, the more vague will those symptoms be, the more difficult the elucidation of their cause, the greater the need, in the first place, of a general investigation by one whose daily practice covers the whole of disease.

Even in the study of one disease it is doubtful if specialism necessarily leads to surgical skill of the highest order. We hear today of thyroid specialists. What is a thyroid specialist? Is he necessarily better than the non-specialist thyroidectomist? Indeed is he often as good? Will not the surgeon accustomed to operate in all parts of the body, if he specialises in good technique, if he performs the operation for the first few times under apprenticeship and afterwards undertakes it often enough not to forget what he has learnt, do it better than the man who pursues it day after day with single-minded attention? The latter is only too likely to degenerate into that dangerous Pooh-bah the thyroid expert—surgeon, physician, gynæcologist, psychologist, endocrinologist, physiologist, and hæmatologist in one.

The surgeon who is his own physician, though he often has a fool for a colleague, has the happiness of working in an atmosphere of mutual confidence and admiration. He is, however, apt to go astray in departments of surgery, such as those dealing with the treatment of thyroid diseases and of hypertension, in which the decision to operate involves a general assessment on the widest grounds, and in which the operation demands careful workmanship and close attention to detail. In these the surgeon's chief duty is to be an expert craftsman. He should know enough to understand what his medical colleague is talking about, enough to argue with him intelligently, enough even on rare occasions to disagree flatly with his conclusions; but, the decision having been reached, his rôle should be that of the technician, seeking to attain the objects which the physician has found to be most desirable by the means he knows to be most certain and most safe.

THE MEASURE OF GREATNESS

Such are the men who enter surgery, and such are the paths open to them when they have made their choice. What of the journey—their life? Some plod wearily along it and some fall out: most march on gladly and hopefully: a few travel triumphantly ahead, smoothing the path as they go and giving fresh heart to those who follow them.

> "Lives of great men all remind us
> We can make our lives sublime,
> And, departing, leave behind us
> Footprints on the sands of time."

Who have been the great men of surgery? As we look into the past, great names crowd upon us, and we can speak only of a few of them. There are those whose lives are now matters of history—Thomas Vicary and Ambroise Paré, Hunter and Astley Cooper, Syme, Ferguson and Liston, Benjamin Brodie, Pott and Paget, Lister, Spencer Wells, Lawson Tait, Jonathan Hutchison, Hugh Owen Thomas, Von Mikulicz, Billroth, Trendelenburg, Dupuytren. There are others whose names are more recent in our memory, who have been seen and heard by many of us—Macewen, Rutherford Morison, Trotter, Lane, the Mayos, Cushing, Halsted, Murphy, Kocher, von Eiselsberg, and Kirschner. And there are those still with us—Matas, Gallie, Evarts Graham, Frank Lahey, Danis, Gordon Taylor, Sampson Handley, Grey Turner, Henry Wade, Gillies, Jefferson, Zachary Cope, John Morley, and Harry Platt—all secure of their niche in Valhalla, and others, our contemporaries and juniors, whose names are now pinned on the notice-board for consideration. What have these men in common?

In judging a surgeon we must consider qualities of the head, the heart, and the hand. We must consider his knowledge of the basic sciences on which surgery is founded, of the history of surgery, of contemporary literature on his own and related subjects, knowledge based not on reading alone but also on travel and on constant intercourse with his fellows. We must consider his wisdom—that is, his capacity to blend the knowledge gained from reading and from his own experience into a clinical common sense which he is able to apply to his daily problems as they arise, his readiness to look on surgery as a whole, and to see it in relation to the great body of science. We must consider his originality, his power to see a common factor linking scattered observations and to follow the path those observations blaze to fresh knowledge, to see the fallacies in old methods and to plan new ones; his ability to avoid complacency and to preserve throughout life an attitude of alert and adventurous expectancy. We must include in qualities of the mind his power to instruct by word of mouth or pen, to see through the trappings of a matter its essential core, to write clearly and speak convincingly.

Of qualities of the heart that a surgeon must possess the first is humility. The great surgeon is humble by nature, because the things he has done count for him as very little in comparison with the great mass of the things that yet remain to be done. He is slow to criticise others, yet tolerant of those who criticise him. He has an instinctive love of his fellowmen, a sympathy that considers each case as a human problem requiring individual treatment, a human understanding that can interpret the patient's halting story in terms of the sorrow, hopes, and fears that the words conceal. Because of his humility and human kindness he is approachable to his juniors. He must have courage to undertake the desperate risk and, having failed, to study why he failed and undertake it again. He must be prepared to face unpopularity and even failure in the pursuit of what he believes to be right, to meet censure and ignore it if he knows it to be unfounded.

Lastly we must consider his manual skill, for in the use of his hands his other qualities find their final expression, of several possible courses is the most dangerous if not the most likely, and therefore the one which must guide his actions. Before he decides to await fresh evidence he must consider whether the patient's state is likely to improve or to get worse in the interval. To the relations he must often say: "I do not yet know what is wrong, but it is something serious, and it is getting worse. Even in this uncertainty I advise an operation, because I believe its risks to be less than those of continued waiting, and because I know it will tell us what is the matter and probably allow us to put it right."

Even in matters of no urgency, where life and death are not at stake, a decision based on half-knowledge and intuition is often needed. A lump of doubtful nature, but clearly innocent, may be found in a young woman's breast. Should it be watched, or should it be removed? The answer is more in the realm of human relations than of pathology or diagnosis. Will she accept reassurance and forget her lump till the next visit, or will she be haunted by the fear of cancer night and day?

A girl may complain of slight digestive disturbances, and on several occasions may be found to be tender over an area the size of a two-shilling piece at McBurney's point and nowhere else. Observation of the temperature, blood-count, sedimentation-rate, and barium meal show no abnormality. Should the appendix be removed? Tell it not in the medical schools, but there is such a thing as chronic appendicitis. Tests will not show it, and the only proof is that at operation the appendix is found to be abnormal, and after it the patient is found to be well. The abnormality is not gross, but pathology differs from law in that it takes particular notice of small things. The chronically inflamed appendix when removed looks more opaque than the normal one, a dull white instead of a translucent pink; it is a little more rigid, and it can be bent but not tied in a half-hitch; it is more vascular, and the vessels are not limited to its attached margin but form a continuous crest along its *antimesenteric border*. The patient after its removal undergoes no dramatic change but merely says: "Now at last I am really well." These "chronic appendices," as distinct from the relapsing ones, have never been acute. They harbour a resident pathogenic organism, often a *streptococcus*. Though they usually give rise to no more than vague ill health they may be responsible for the most dramatic train of symptoms.

The removal of a chronic appendix can do nothing but good, and the removal of a normal appendix in all honesty can do no harm. On the other hand, there is no operation more disastrous than facile appendicectomy where the disease is in the patient's mind or the surgeon's morals. Here again the choice is philosophic rather than scientific, a decision rather than a diagnosis.

The surgeon, then, has been drawn to his life's work because of certain qualities born in him or developed by his upbringing. Because he is a doer rather than a thinker, because he seeks practical tools and hopeful tasks, because he enjoys helping and being helped by his fellowmen, he finds satisfaction and happiness in the corporate loyalty of a surgical team and the cheerful banter of a surgical ward. As the years go by he becomes fixed in the same mould. He seeks sports such as sailing, hunting, and mountaineering, in which companionship, manual skill, hard work, and a spice of danger are combined. He is seldom a profound reader, a good speaker, or a writer of distinction. The physician on the other hand tends to the solitary and sedentary pursuits, such as fishing and golf, to become a collector and a patron of the arts. I may perhaps be allowed to contrast the research laboratories, the extensive educational programme, the museum and library, the daily meals, evening refreshments, and students' hostels of Lincoln's Inn Fields with the formal eponymous lectures, traditional ceremony, and old-world dignity of Trafalgar Square.

SPECIALISATION

Life, however, is not quite so simple as it was described by the sentry in *Iolanthe*. Every boy and every gal that's born into this world alive is not necessarily a little liberal or else a little conservative; there are left-wing conservatives and Tory democrats, and between them the decisive mass of the *untied* electorate. The student is undoubtedly inclined by his natural qualities or early upbringing towards medicine or surgery, but his course thereafter is not immutably fixed like that of a drop of rain falling in the Black Forest, which may find its way down the Rhine to Rotterdam, or, if it falls a few yards to the north, will pass down the Danube and through the Black Sea and the Sea of Marmora to the Mediterranean. He will find at all stages of his career avenues leading from the main track, some taking him back to a highway which he had already rejected, others wandering through solitary and even unexplored country.

Specialisation is a word that has almost lost its meaning. Today all God's children are specialists—the man who cuts our hair, the man who mends our wireless, the man who cleans our chimneys. The term is used everywhere as a synonym for expert; but are specialisation and ability really synonymous? Is a specialist in one branch of an art, trade, or profession necessarily superior to the man who practises the whole of it? If so, is he at the same time inferior to one who practises a subdivision of that branch, and he in turn to one who confines his labours to one small aspect of *that* subdivision?

Specialisation arises in several ways. It may be called into being by the demands of the public, by the needs of the work, or by personal inclination. The public is always seeking what it believes to be the best, and having no standards of its own it will be guided by a label. Knowing nothing of degrees, appointments, published work, or established reputation, it flocks to the "Harley Street specialist," not realising that a brass plate sometimes represents nothing but brass, and that the Harley Street district, besides being the home of the elect, harbours many rogues. Having diagnosed its own disease, it seeks the "specialist" in that particular disease without being able to distinguish between the man who has made his own contribution to knowledge and the one who has set up his barrow where he suspects a good market. Public demand thus provides a reason but hardly a justification for specialism.

Specialism arises as an outcome of the needs of practice whenever new problems appear in medicine or surgery, or when old ones require further study because some fresh discovery has shed new light on them or initiated a new line of treatment. It is necessary in the case of diseases, methods of investigation, or operations so rare that only by segregation is it possible for them to be studied in series or viewed as a whole. It arises where investigation or treatment involves the use of instruments or methods alien to those of general medicine or surgery, whose use requires special skill or long apprenticeship. It arises too for convenience in segregating patients of one sex, or one age-group, in the practice of a hospital.

Most surgeons, in however general a way they have started and however "general" they may wish to remain, become to some extent specialists as they grow older, because they are attracted more and more to work of a special kind, because chance association or some feature of the district in which they work brings them many cases of a particular nature, or because they are recognised by their fellows as being unusually skilled in some form of treatment, and are asked to undertake it to an extent that practically excludes other work.

Such specialisation, which is the natural outcome of a man's inclinations and ability, is inevitable, indeed highly desirable. All specialism, whether medical or surgical, has originated thus in the vision, energy, and open to the password of ability of any kind. A first class in any honours school; a contribution to music, painting, sculpture, or literature considered meritorious by experts in that art; original work in history, biology, chemistry, or mechanics—all these should be accepted not as substitutes for the examination but as justifying a more lenient standard in the other part of it.

A qualifying examination is necessary, for it is essential that the recruit in any art or science shall, at the outset of his career, be familiar with the whole body of orthodox knowledge which has been built up by those before him and must form the platform from which he will start on his own career. He may in future diverge in any way he likes, but he should not, through ignorance, make mistakes that have already been made and corrected, or strive laboriously towards knowledge which is already available for the asking.

The final examination must be searching but it must be kind. It should seek to find out not what the candidate has been taught but what he has learnt for himself, not what he thinks but how he thinks. It should be kindly enough to put him at ease, and leisurely enough to allow the examiner to get past his nervousness and see through his bluff. The more carefully the examiners are chosen for their human qualities rather than for their academic status, and the more the numbers of the candidates are reduced by preliminary sorting, the fairer will such an examination be.

TRAINING

The training of a surgeon, at any rate of one who is o be more than a journeyman operator, begins after he as taken a higher surgical degree. Knowledge must e increased, wisdom must be acquired, originality must e developed, the ability to speak and write must be earnt by constant practice, and operative experience nd technical skill must be gained by apprenticeship. hese things cannot be found in books. They cannot be elf-taught by the isolated surgeon undertaking responibility without supervision. They can be learnt only y the methods by which every art is learnt, the personal ontact of disciple and teacher. The most important hing therefore in the training of a surgeon is the selection f the man who shall train him. Here again personality s more than ability, the heart is more than the head or he hand. The teacher may not have contributed many dvances to his subject, but originality is a gift that may e discovered but cannot be transmitted; he may be n indifferent operator, but manual skill can be picked p for the watching in any surgical workshop. But if he s able to transmit to his pupils the fire that is in him, o that they think, live, and dream surgery, and turn in heir waking hours to the surgical thoughts on which they have gone to sleep, he will breed a group of young surgeons who will develop the best of which they are capable. And that, after all, must be the aim of training—not to produce men of a certain stamp but to attract the best men to surgery, hand on to them the best we ourselves know, help them to develop the talents that each possesses, and remain prepared to recognise and encourage the best, whatever form it may take and from whatever source it may come. We cannot find the real genius; he will find himself. We cannot do more than start his training, for in the end he will train us.

By planned evolution man has, in the world of plants and animals, produced some striking new forms but ones that have also lost the strength and resilience of their natural stock. By planned education we may lose some essential qualification in striving to develop another. Before the war of 1914–18 the cadet surgeon was given a training that developed his knowledge and teaching ability to the full but did little to train his originality, power of decision, or manual skill. He spent his days teaching in the wards or the dissecting-rooms. He was seldom allowed to operate, and even when he was appointed assistant surgeon he had no beds in his own right. The surgeons trained under this system were fine clinicians and gifted teachers, the writers of excellent textbooks, but they contributed few advances of importance, and they were, on the whole, indifferent operators. The juniors between the two world wars were encouraged to operate at an age and to an extent that were possibly harmful. They did not get enough apprenticeship in bedside discussions or in the basic manœuvres of surgical handicraft. They did not get enough time to think, to read, to watch others at work, to keep themselves in touch with the world outside surgery. They tended to become slick technicians, virtuosos rather than maestros, to be interested in the drama and intricacy of an operation rather than in its purpose, the welfare of an individual patient.

I believe that in the organisation of the surgical services in the recent war we came very near to steering the ideal course between regulated orthodoxy on the one hand and unrestrained empiricism on the other. To those surgeons fortunate enough to be assigned an active rôle in it, the war was the perfect university. They mingled at work and at play with others from every medical school in the English-speaking world. They discussed their problems with men who had faced the same difficulties under different conditions of climate, housing, and supplies. They could seek help from surgeons of greater experience and in turn could sort out their own ideas by helping the newcomer. They were watched, helped, encouraged, guided, restrained, and, if necessary, rested or replaced by consulting surgeons who were watching the whole progress of war surgery over a wider horizon than they could possibly cover. They kept records of their cases, and received reports of the same cases later from other hospitals. They worked in the stress of a forward operating centre during battle and equally hard in the more regulated surgery of a base hospital. They collaborated and argued with experts in every branch of medicine or medical research. They attended conferences. They were inactive for weeks at a time, and if they had used their previous experience well they often learned most in these fallow periods; for it is a peculiarity of the human mind that it is often most fertile in idle periods between spells of hard work. It may thus happen that, while he is watching a chameleon stalking flies in the western desert, or leaning over the rail in some Pacific harbour while the remains of a fleet's breakfast swirls along the ship's side, a surgeon will capture the idea that has eluded him during weeks of intensive study.

INTEGRATION OF KNOWLEDGE

One of the greatest needs of surgery as a whole, as it is for the individual surgeon, is the integration of accumulated knowledge. Intellectual progress, like bodily growth, demands ingestion, digestion, absorption, synthesis, and the elimination of waste products. Many men are spending a forty-hour week on a moderate but secure salary accumulating facts. Many men are describing new signs or symptoms, syndromes or diseases, new instruments or new operations. Very few are attempting to correlate these facts, to sift the corn from the chaff, to take a broad view of the present state of surgery in its relation to medicine as a whole or even to the great body of science, largely because few have the leisure to do so.

Research scholarships and fellowships are now so plentiful that, in many cases, they are no longer a spur to the ambitious and a help to the deserving but a refuge for the timid and a pension for the plodder. Practical benevolence may in the future be more profitably directed to endowing, with the liberality that the position they have secured for themselves warrants and the commit-but we cannot assess mere technique particularly high. Even in plastic surgery, where meticulous artistry might be thought to be the first consideration, the best results are obtained by those who think, plan, and prepare, rather than by those who perform with the self-conscious skill of the trapeze artist. Many of the greatest surgeons were but indifferent operators; and conversely many, perhaps most, brilliant technicians have been second-rate surgeons, earning the meretricious applause of the virtuoso while their artistry was at its heyday—forgotten like the discarded prima donna as soon as their skill passed its zenith.

If we digress from good to bad surgeons, it is difficult to define a bad surgeon more clearly than as one to whom technique is everything, one who has inherited the trends but not the traditions of a great master, who has his mannerisms without his manners. He looks at disease through an endoscope. He speaks of cases not patients. He has no culture, no knowledge of the basic sciences, and therefore no breadth of vision. He knows all about operating except when to refrain.

Probably no surgeon, however great, has possessed all the desirable qualities in their perfection, but those who have become great have possessed many of them in high degree. Greatness of the hand is greatness of the hour, lasting only while the skill lasts and forgotten within a few months of death or retirement. Greatness of the head leads to a secure place during life and an honoured memory afterwards. Greatness of the heart brings a personal influence on patients and pupils and a name that will live among them for one or more generations. When greatness of head and heart are found together they bring immortality; for, though contributions to science and literature become superseded by fresh knowledge, or are merely consulted by the curious as eponyms, such contributions linked to the memory of a human personality and a loved teacher live for all time.

If the ability to found a school in the place where he has worked, and to leave a living memory rather than a bibliography, is the test of greatness, then personality is the most important attribute of the great surgeon. Lawson Tait had an original mind and great operative skill, but he was a boor. Macewen was perhaps the greatest surgical genius of the past 100 years; he had courage in the highest degree, but he lacked generosity and humility; he was admired but not loved and he left few friends and no disciples. Robert Jones, on the other hand, was loved as few surgeons have been loved, and he trained a host of disciples; but he was not outstanding either as an operator or a thinker and, when the present generation of his pupils has passed away, he will be remembered chiefly as the nephew and disciple of Hugh Owen Thomas. John Hunter and, more recently, Rutherford Morison stand out as examples of men who left contributions of lasting importance, the memory of colourful personalities, and successors who carried their names and methods to other years and other lands.

Of Hunter much has been written. His mind wrestled with the whole range of anatomy, physiology, and pathology, often failing because the problems he attacked could not be solved with the methods and instruments of his day, but pointing the solution to those who followed. The fire of his genius threw a beam into the darkness ahead and lit the torch of inquiry that has been the glory of British surgery. His example inspired his contemporaries, and his pupils carried his gospel to all countries.

Rutherford Morison is honoured everywhere in the world, particularly in this place and particularly today. He was great by any definition, because he excelled alike in those qualities of the head, the hand, and particularly of the heart that make for greatness in surgery. He was perhaps fortunate in that, being endowed with a great brain, he was not subjected to any system of education such as we are planning today for the surgeons of the future, designed to mould them to our own conception of the ideal surgeon. He educated himself, and he spent his early years in general practice, where he gained that intimate insight into human nature that was one of his most endearing characteristics. Having entered surgery, he became and remained through life a student of pathology. Of his manual skill many can speak with greater authority than I, but as an operator he was ahead of his time. He will perhaps be remembered best by his operation for ascites and by the right kidney pouch which bears his name, but he was also a pioneer in operations for cancer of the breast, in the dissection of cervical glands, and in gastrectomy. He remained through life a great practical surgeon, careful in undertaking, thorough in performance. Rutherford Morison excelled in qualities of the heart. His teaching was human, vivid, and personal, based on his knowledge and love of the Tynesiders who were his patients and his students. He taught in general principles, which the problem in hand was used to illustrate. And because he was a great man as well as a great surgeon, he handed on the spirit as well as the letter of his creed, and became the greatest disseminator of surgical thought and the greatest maker of surgeons within living memory. Rutherford Morison lives today in two of his greatest pupils, George Grey Turner and Charles Saint, and through them in the surgical departments of the Post-graduate Medical School of London and of the University of Cape Town.

These great surgeons were men of our race. Let us not forget that all the decisive advances in surgery, the application of the scientific method, the development if not the invention of anæsthesia, the demonstration of the cause and prevention of sepsis, the establishment of the technique of asepsis, and finally the discovery and isolation of penicillin, originated in this country, and that British surgery has at all times been and still remains the best in the world.

SELECTION

How can we ensure that this happy state of affairs shall continue? How shall we breed the great surgeons of the future? There are at least four stages in the forming of a surgeon: he must be found, he must be qualified, he must be trained, and he must be given opportunities. If surgery is the high calling we believe it to be, if it deals with problems of the utmost importance in the life of the individual and in the economy of the nation, it must be kept in the hands of worthy men, and worthy men alone. The equality of man is a political belief but not a biological fact, and if we wish our future surgeons to be first-class men we must begin by selecting first-class students to enter surgery.

This selection is made in the English Fellowship, and will shortly be made in the Scottish one, by a preliminary examination. In so far as this acts as a sieve, eliminating the plodders and reducing the entrants for the final examination to numbers that can be assessed thoroughly and fairly, it is good; but in so far as it is vocational in type, and demands not merely a minimum quantity but a certain quality of ability in future surgeons, it is bad. Surgery needs men of every kind—philosophers, dreamers, and poets as well as teachers and men of action—and even the present much improved primary examination sets a premium on a retentive memory and takes little heed of originality.

I reiterate my plea that, though the number of higher examinations should be progressively reduced, thus removing the bar to lateral migration of the gifted from one branch of practice to another along the paths where interest leads and material beckons, there should be a common portal leading to all higher degrees that would

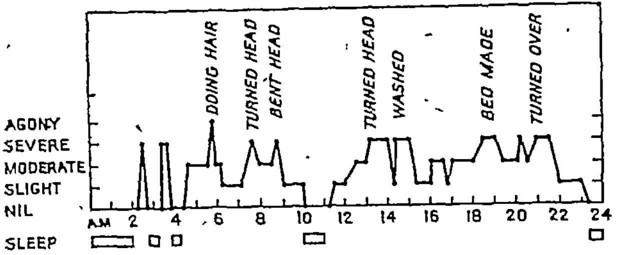

Fig. 4—Chart of pain in region of left trapezius in idiopathic steatorrhœa with tetany (case 4) showing relation of pain to muscular activity.

Though some attacks are typical in their short duration, others last longer and subside leaving hyperalgesia. The patient was intelligent and coöperative but anxious and aware of the diagnosis of "angina." The element of psychogenic overlay in addition to the "organic" pain is present in some attacks. Few cases of angina of effort survive awareness of the diagnosis for many years without this functional overlay.

Case 3.—Fig. 3 shows the relation of epigastric pain to food and alkalis in a patient with gastric ulcer.

USES

The observation of such cases led to the conclusion that this method of charting pain would be capable of revealing more clearly than has yet been possible the intensity curves of pain in ill-understood conditions, such as rheumatoid arthritis, tetany, and carcinomatosis.

Case 4.—Fig. 4 is a pain chart from a woman of 50 with idiopathic steatorrhœa and tetany. Pain was being experienced in many muscles. For the purposes of the chart, observation was limited to pain in the region of the left trapezius. At the time of observation she showed positive Trousseau's and Chvostek's signs. She was a stable and accurate witness.

Though we are told that tetany is a painful condition, it needs the intensity curve of a pain chart to bring full realisation of this. Its close relation to muscular movement is clearly shown.

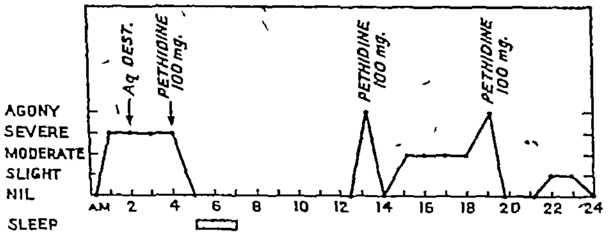

Fig. 5—Chart of organic pain in penis in tuberculous cystitis (case 5) showing response to pethidine intramuscularly but not to distilled water.

These examples illustrate how further knowledge of the intensity of pain can be acquired in various types of cases. By this method relationships between pain and environmental events often emerge more clearly than in the history, and sometimes appear for the first time.

RESPONSE TO ANALGESICS

Another use for the pain chart is in the assessment of response to analgesics.

In the production of pain there are always two elements—the physiological factor of the painful stimulus and its transmission, and the psychogenic factor, which modifies the former in the production of pain. Three broad clinical types of pain can be distinguished: (1) "organic" pain produced by pain stimuli and not modified by suggestion; (2) "psychogenic" pain, which has little or no organic basis and is maximally influenced by suggestion; and (3) "mixed" pain, which combines both elements in various proportions and is the commonest form met with in practice.

It is important to realise that analgesics act by the power of suggestion as well as by their specific analgesic property, and that even in the presence of an apparently sufficient organic cause, such as carcinoma of the stomach, pain may be predominantly psychogenic.

Case 5.—Fig. 5 is part of a pain chart from a man of 37 with bilateral renal tuberculosis and severe tuberculous ulceration of the bladder, who complained of intense recurring pain in the penis, worse on micturition. The absence of response to injection of distilled water is constant in contrast to the effect of pethidine. These observations were repeated several times.

Case 6.—Fig. 6 is part of a pain chart from a man, aged 36, who had undergone splenectomy a year earlier for Banti's disease, partly because of severe pain in the left hypochondrium. He was admitted to hospital with a moderately severe hæmatemesis. Two days later he complained of severe pain in the right hypochondrium, worse on breathing but persistent for long periods. The pain was thought to indicate perihepatitis, and close search was made for a rub, but none was heard. On several occasions response to injection of distilled water was similar to that to pethidine 100 mg. and to morphine gr. $^1/_4$. In all cases it was irregular in duration. Because of this, strong reassurance was given; within a few hours the patient was out of bed, and he has now remained free from pain for ten months.

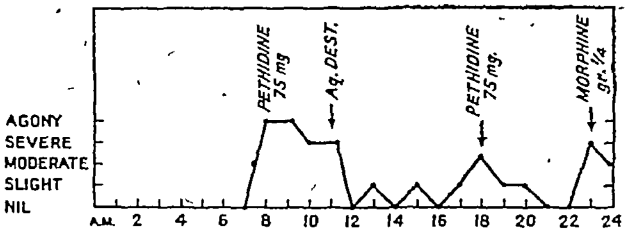

Fig. 6—Chart of psychogenic pain in right hypochondrium in Banti's disease (case 6) showing response to distilled water and irregular response to morphine and pethidine.

This case illustrates the characteristic features of psychogenic pain: (1) irregularity of occurrence, with absence of evidence of organic cause; (2) response on several occasions to a placebo such as distilled water; and (3) irregular response to potent analgesics. Pain charts must be kept for some days to establish these points. In case 6 the chart was largely responsible for converting diagnosis from that of possibly organic pain to that of psychogenic pain.

Case 7.—Fig. 7 is the pain chart from a woman, aged 65, with a fungating carcinoma of the rectum, involving the sacrum, with persistent sacral pain. The effect of the injection of distilled water is comparable with that of morphine. Control of pain depended more on suggestion than on analgesics in this case.

Figs. 5 and 7 are selected from a group of 16 cases of painful organic disease in which assessment of the effect of analgesics was being attempted. It was interesting to observe that 11 of the 16 responded with relief of pain to the administration of distilled water. This was an unexpectedly large proportion and makes clear that in most people the suggestive value of an injection is very real. The specific analgesic property of drugs is reflected only in the pain charts of the remaining 5 cases, one chart of which is shown in fig. 5.

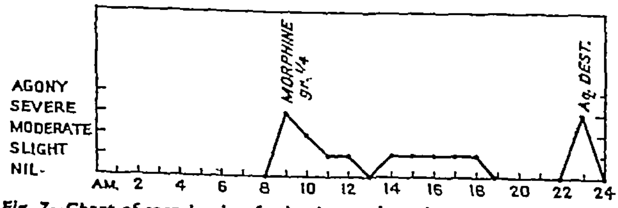

Fig. 7—Chart of sacral pain of mixed organic and psychogenic type in rectal cancer (case 7) showing responses to morphine and to distilled water.

ments they have already undertaken requires, travelling fellowships for successful clinicians between the ages of 40 and 50, so that they may step aside for a year or two from the labour of clinical work and the struggle for economic security and see for a while, as onlookers, the battle in which they have been engaged; so that they may travel and assess the work of their contemporaries in other lands with calmer impartiality and more balanced judgment than the immediate postgraduate can ever do; so that under the stimulus of these fresh contacts they may review the experience of the past ten or fifteen years and attempt to work out the half-formed ideas that have been struggling to find expression.

THE PAIN CHART

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THE assessment of pain is of prime importance and necessarily depends on the patient's statement and the observer's judgment. In so far as a method can be devised whereby the inaccuracies involved in a patient's description are reduced to a minimum, an approximation to a "true" description of pain will be obtained.

Sir Thomas Lewis[1] concentrates on qualitative variations and their significance, but considers that "a feature to which too little attention has been given is what may be called the time-intensity curve of pain." This has been my opinion for many years, and the pain chart was designed specifically to meet this requirement and to make the record as accurate as possible. These are but the first steps in rendering pain intelligible to the observer; other factors—e.g., sensitivity to pain—are of obvious importance, but this paper is concerned only with the usefulness of the pain chart.

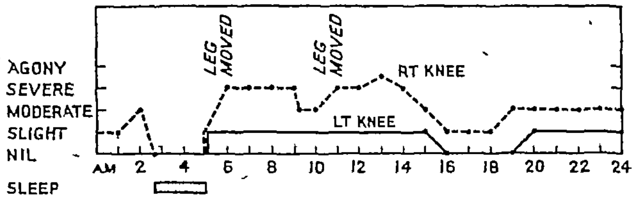

Fig. 1—Chart of pains in right and left knees recorded separately on seventh day after excision of knee-joints for arthritis with deformity (case 1) showing more pain in right knee, in which, unknown to the patient, apposition at operation had been more difficult.

PRINCIPLES

Elimination of Inaccuracies of Description

Inaccuracies of description on the part of the patient arise from three main causes: (1) difficulty in finding words to describe an unusual if not unique experience (Virginia Woolf appreciated this difficulty when she wrote: "let a sufferer try to describe a pain in his head to a doctor, and language runs at once dry"); (2) confusion about what features of this experience are relevant to the observer; and (3) difficulties in remembering the experience.

The pain chart is a time-intensity curve. Qualitative features of pain are therefore ignored. Quantitative assessment of severity is concerned. From this aspect the words chosen spontaneously by patients describing pain were observed, and it was noted that the four words most commonly used in describing degrees of severity were "slight," "moderate," "severe," and "agonising." The following definitions of these terms were reached:

(1) "Slight" pain means awareness of pain without distress.

(2) "Moderate" pain distracts attention from a routine occupation such as reading or housework.

(3) "Severe" pain fills the field of consciousness to the exclusion of other events; visceral reflex accompaniments often occur.

(4) With "agonising" pain motor effects, as evidenced by restlessness, may occur, or the syndrome of "shock" ensue.

These words are explained to the patient and written on a chart for him, thus eliminating his difficulty of choice in words, and confusion about the relevant features.

The Time-intensity Curve

The chart given to the patient is also mapped out into 24 spaces for the hours of the day, and the patient is instructed how to record hourly observation of intensity of pain. If there is a change of intensity this too is to be charted with its time and duration and its relation to any possibly relevant event. Inaccuracies of memory are minimised by almost immediate recording of the pain.

The task is simple, and in almost all cases welcomed by the patient, who after a trial rapidly understands the object of the record. The patient's attempt to grasp the situation often gives information about his intelligence, stability, and coöperation.

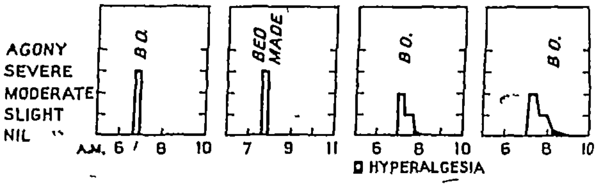

Fig. 2—Chart of substernal pain in angina pectoris (case 2) showing (1) *onset of pain after slight efforts, and* (2) *different types of attack,* some being followed by hyperalgesia. B.O. = Bowels open.

VALIDITY

To test the validity of this method of recording the intensity of pain, cases of pain following known stimuli were selected. The course of postoperative pain is to some extent simple and understood, so charts were made after various operations.

Case 1.—Fig. 1 is a postoperative chart in a case which presented an unusual opportunity for testing the validity of this method, since the operation consisted of excision of both knee-joints for arthritis with deformity. On the left knee the procedure was easy. On the right, considerable difficulty was experienced in obtaining apposition with consequent increase of manipulation. The patient was ignorant of this difference.

The pains in both knees were charted separately on the seventh postoperative day. The increased amount of pain experienced in the right knee as compared with the left is clearly shown by the chart.

Further tests of the method consisted of obtaining charts from cases with typical pain syndromes.

Case 2.—Fig. 2 is the pain chart of a man, aged 65, with *seven years' history of coronary disease with angina of effort* Pain was substernal, radiating to the left arm. The attacks could be *induced by slight effort, including defæcation*

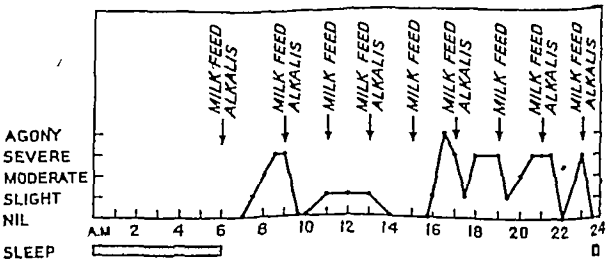

Fig. 3—Chart of epigastric pain in gastric ulcer (case 3) showing relation of pain to food and alkalis.

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1. Lewis, T. Pain. London, 1942.

TABLE I—FINDINGS IN CEREBROSPINAL FLUID IN 14 HUMAN CASES OF LEPTOSPIROSIS CANICOLARIS

Case no.	Day of illness	Nonne reaction	Pandy reaction + or −	Conc. of phenol solution %	Sugar content	Cells per c.mm.	Mononuclear cells %
1	7	+	−	5	Low	2450	33
	9	tr.	−	4	Normal	497	35
2	4	−	+	8	Normal	12	40
3	7	tr.	+	4	Low	836	90
	9	tr.	+	6·5	Low	14	100
4	7	tr.	+	6·5	Normal	2408	70
	11	tr.	−	6·5	Normal	150	84
5	7	tr.	+	8	Normal	208	28
	9	tr.	+	6·5	Normal	63	20
6	7	−	−	..	High	26	16
7	8	tr.	+	6·5	Low	440	56
8	7	tr.	+	5	Low	1540	6
	9	tr.	+	6·5	Low	101	98
11	8	+	+	5	Normal	1600	10
	11	+	−	7	Normal	320	75
12	8	+	+	7	Normal	1040	20
	9	+	−	8	Normal	1368	10
13	10	tr.	+	7	Normal	128	47
14	13	tr.	+	8	Normal	120	22
15	5	tr.	+	7	Normal	15	60
	7	tr.	−	7	Normal	1336	28
16	8	+	+	5	Normal	960	7

mononuclears ranged from 6 to 100%. Segmented and mononuclear cells predominated, with about equal frequency; hence the condition could not justly be ermed a lymphocytic meningitis.

Urine

The urine contained albumin in 10 cases and urobilin in 9. In 6 cases a few erythrocytes, and in 3 cases hyaline casts, appeared temporarily in the sediment. In 7 of the 14 patients we observed a moderate oliguria (less than 1 litre a day with normal fluid intake) lasting from a few days to a week, with poorly concentrated urine (sp. gr.: below 1·015). The chloride content of the urine was low in 5 cases. No bilirubinuria was found.

Blood

In 13 of the 14 patients the blood-urea level remained from slightly to moderately high (600–1400 mg. per litre) for one to three weeks:

1400 mg. litre in 1 patient	700 mg. litre in 2 patients
1150 ,, ,, 1 ,,	650 ,, ,, 2 ,,
900 ,, ,, 1 ,,	600 ,, ,, 3 ,,
750 ,, 3 patients	

A slightly raised value for the van den Bergh indirect reaction was found in 4 patients only (1·0, 1·4, 1·2, and 1·2 units). Possibly we might have obtained more pathological readings if we had done the tests at an earlier stage. In many cases, however, it was not until the disease was far advanced that we were led to suspect leptospirosis. Since we have adopted the routine of testing the blood of all patients with serous meningitis for bile pigments, even when there is no question of leptospirosis, we have found increased values in many cases; this applies also to blood-urea. Thus high values for the van den Bergh reaction and the blood-urea level do not help in the differential diagnosis of the various forms of serous meningitis.

In most cases we found the chloride content of the serum to be lowered:

345–385 mg. per 100 ml.	8 patients
400 ,, ,, ,, ...	2 ,,
533–562 ,, ,, ,, ...	2 ,,
540–585 ,, ,, ,, ...	2 ,,

The erythrocyte-sedimentation rate (E.S.R.) remained high to very high for a considerable time (14–109 days after admission to hospital):

E.S.R. on admission (mm. in 1 hr.)..	68	72	60	65	100	48	42	25	72	40	22	17	94	86
Days to become normal	1	41	37	37	109	71	34	30	72	14	14	60	90	28

The white-cell counts ranged from 6100 to 16,000 per c.mm. There was a pronounced shift to the left in 4 cases, and lymphopenia in 3. The eosinophils in the 14 cases were 0% in 9 cases, 3% in 1 case, 4% in 3 cases, and 12% in 1 case.

Liver

Owing to shortage of staff it was impossible to carry out liver-function tests on all the patients; in some cases where such tests were made they revealed distinct functional disturbance.

Relapses

In 4 cases there were relapses (on the 14th–17th day) which lengthened the illness by 12–33 days.

TABLE II—BACTERIOLOGICAL AND SEROLOGICAL FINDINGS IN 17 HUMAN CASES OF LEPTOSPIROSIS CANICOLARIS

Case no.	Day of disease	Examination for leptospira in— urine	blood d.-c.	blood g.-p.	Serological reactions with leptospira strains: Ictero-hæmorrhagiæ Antigen A	Antigen AB	Canicola	Grippo-typhosa	Ballum	Sejroe and pomona
1	7	..	−	−	1:100	1:30	1:100	−	−	−
	14	−	..	..	1:1000	1:30	1:1000	1:100	−	−
	21	..	..	..	1:1000	1:100	1:30,000	1:100	−	−
2	4	..	−	−	..	..	..	..	..	..
	14	..	..	..	1:100	−	1:3000	1:10	−	−
	20	..	..	..	1:100	−	1:10,000	−	1:100	−
3	15	..	..	..	1:3000	1:1000	1:3000	−	−	−
	136	..	..	..	1:300	1:30	1:1000	−	1:100	−
4	10	..	..	..	1:1000	1:1000	1:300	−	−	−
	20	..	..	..	1:100	1:100	1:3000	−	1:100	−
5	12	..	..	..	1:3000	1:3000	1:1000	−	1:100	−
	20	−	..	..	..	..	..	..	..	..
	43	..	..	..	1:300	1:300	1:3000	−	1:3000	−
6	8	..	−	−	..	..	..	..	..	..
	11	..	..	..	1:30	1:10	1:300	1:100	1:100	−
	21	−	..	..	..	..	..	..	..	..
	28	..	..	..	1:300	1:300	1:10,000	−	1:3000	−
7	12	..	..	..	−	−	1:300	−	−	−
	20	−	..	..	−	−	1:1000	−	−	−
8	8	..	..	..	1:100	1:300	1:300	−	−	−
	20	..	..	..	1:1000	1:10	1:3000	−	1:1000	−
	26	..	..	..	1:300	1:10	1:10,000	−	1:1000	−
9	13	..	..	..	1:300	1:300	1:3000	..	..	..
	53	..	..	..	1:300	1:300	1:3000	..	..	..
10	15	..	..	..	1:300	..	1:1000	..	..	..
11	8	..	−	−	−	−	−	−	−	−
	17	..	..	..	1:3000	1:300	1:3000	−	−	−
	25	..	..	..	1:300	1:100	1:10,000	−	1:100	−
12	8	..	−	−	−	−	−	−	−	−
	22	..	..	..	1:1000	1:30	1:3000	−	1:300	−
	37	..	..	..	1:300	1:10	1:3000	−	1:300	−
13	8	..	..	..	1:10	−	1:100	−	−	−
	11	..	..	..	1:100	1:30	1:300	−	−	−
	21	..	..	..	1:300	1:10	1:1000	−	1:10	−
	90	..	..	..	1:30	1:10	1:1000	−	1:30	−
14	10	..	..	..	1:300	1:100	1:1000	−	1:300	−
	86	..	..	..	1:10	1:10	1:300	−	1:30	−
15	4	..	−	−	−	−	−	−	−	−
	14	..	..	..	1:1000	1:1000	1:10,000	−	1:100	−
16	9	..	..	..	1:100	1:100	1:100	−	−	−
	15	..	..	..	1:1000	1:300	1:3000	−	−	−
17	12	..	..	..	−	−	1:30	−	−	−
	20	..	..	..	1:300	1:300	1:10,000	−	−	−

d.-c.=direct culture; g.-p.=guineapig.

Though the suggestive effects of all modes of treatment are recognised to be important, there has been a remarkable tendency to ignore this factor in assessing the many medical or surgical pain-relieving procedures designed in the past. Any procedure with a high suggestive content will probably have some success in over 50% of cases, regardless of any specific interference with the physiology of the pain. This needs to be borne in mind particularly when considering the benefits of operation for anginal pain or the pain of peptic ulcer.

SUMMARY

A simple method of minimising errors of description by standardising terminology, and recording intensity of pain in a pain chart, is described.

The validity of the chart has been assessed by observation of pain following surgical operations, and typical clinical pain syndromes such as angina of effort and gastric ulcer.

Pain charts are of value in defining the action of analgesics.

"Psychogenic" and "organic" pain can thus be differentiated.

Even in the presence of organic disease the psychogenic factor of pain is important, and its share in any response to medical or surgical pain-relieving procedures can often be assessed by the use of pain charts.

I wish to thank the ward sisters and nurses of the Royal Northern Hospital, St. Bartholomew's Hospital, and Ashford County Hospital, where this work was done.

LEPTOSPIROSIS CANICOLARIS

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Leptospira canicola, discovered in 1931 by Klarenbeek and Schüffner,[12] belongs to a serologically well-defined leptospira type[38] which appears to affect mainly man and the dog. For guineapigs this micro-organism is usually less virulent than *L. icterohæmorrhagiæ*, but *L. canicola* produces a fatal infection in hamsters (*Cricetus auratus*). Other animals used for laboratory tests—e.g., mice and albino, brown, and black rats—remain practically unaffected by *L. canicola*.

An investigation into the extent of infection in dogs [6 17 21 23 26 29 31–34 37] was carried out in various parts of the world with the aid of agglutination and lysis reactions of dog sera with *L. canicola*. The results ranged from 0·6 to 90%.

In dogs, usually males, the disease, which is probably identical with the Stuttgarter Hundeseuche described by Klett and with typhus canum, may run a mild course but is often serious and sometimes fatal. In many of the affected dogs acute or chronic azotæmic or uræmic signs predominate[11 14]; in others ulcerative stomatitis and hæmorrhagic gastro-enteritis are the most striking features, while in some cases jaundice is observed.[8 36] In animals which survive the disease leptospiruria persists for several months; this is easily detected if a drop of freshly voided urine is examined with dark-field illumination. If the urine is acid the organisms soon die.

INCIDENCE IN MAN

Though it appears probable that in many parts of the world most dogs become infected with *L. canicola* and remain infectious for a considerable time, only a few score of cases in human beings have been reported [1–4 7 9 10 13 16 18 22 23 25 28 30 36]:

Country	*Cases*	*Country*	*Cases*
Austria	1	France	5
Germany	1	U.S.A.	7
Switzerland	18	Argentine	1
Denmark	21	China	2
Norway	1	Netherlands	40
England	1		

In the Institute of Tropical Hygiene in Amsterdam 49 human cases of this disease were diagnosed between 1933 and the autumn of 1947 (6 with jaundice; 1 fatal). We have observed 17 of these patients in the Wilhelmina Hospital in Amsterdam (14 as inpatients, 3 as outpatients) in sixteen months starting in the autumn of 1946. (1 in July, 2 in August, 5 in September, 4 in October, and 5 in November.) Our experience at that time caused us to wonder whether we were justified in continuing to regard febris canicolaris as the rare zoonosis which it was generally assumed to be. It seemed probable that further investigation would reveal considerably more cases in man.

SIGNS AND SYMPTOMS

On admission to hospital (in both years only between July and December) these patients were suspected to have epidemic cerebrospinal meningitis, infantile paralysis, or typhoid fever.

Onset

The onset was usually acute, with high temperature, shivering, vomiting, severe headache, dizziness, and *muscular pain which in a few exceptional cases was* practically confined to the calves. Some patients complained of sore throat and obstinate constipation. About half of them had suffered from disturbed sleep and impairment of consciousness, and were described by their relations as having been peculiarly irritable. The clinical data at onset were as follows:

Acute onset	13 cases	Muscular pain (chiefly in calves)	3 cases
Fever	17 „	Stitch in the side	2 „
Shivering	10 „	Lumbar pain	4 „
Vomiting	12 „	Constipation	7 „
Headache	16 „	Nose-bleeding	2 „
Dizziness	10 „	Disturbed sleep	18 „
Sore throat	5 „	Drowsiness	6 „
Pain in joints	5 „	Stiff neck	7 „
Muscular pain (generalised)	11 „	Irritability	9 „

Course

The duration of pyrexia ranged from two to forty-eight days, excluding relapses. The other signs observed during their stay in hospital were as follows:

Seriously ill	15	Lowered blood-pressure	7
Drowsy	7	Slight pulse-pressure	5
Jaundice	0	Exanthema	0
General swelling of glands	5	Hæmorrhages	0
Relative retardation of pulse	9	Injected conjunctiva	4
Herpes labialis	1	Meningeal irritation after admission to hospital:	
Coated tongue	7	lasting 9 days .. 6	
Spleen palpable	0	„ 11 „ .. 4	
Liver palpable	2	„ 12 „ .. 2	
Reflex abnormalities	0	„ 17 „ .. 1	13

No jaundice was observed in these patients; no enlargement of liver or spleen could be felt; and the conjunctiva was injected in only 4 patients. In the 14 inpatients a temporary fall in blood-pressure was observed seven times in the course of one or two weeks, and on five occasions the pulse-pressure was notably low.

Cerebrospinal Fluid

All the inpatients but one showed signs of meningeal irritation nine to seventeen days after admission. In the cerebrospinal fluid (table I) the protein content was increased in all cases (Nonne reaction positive; Pandy reaction positive, except in case 6, with 8–4% solutions of phenol). The sugar content was normal, slightly high, or slightly low; in no case was the Fehling reaction negative, so the value was certainly above 35 mg. per 100 ml. The number of cells varied from 12 to 2450 per c.mm. according to the day of the illness on which the count was made (the number of cells increased in the second week of illness), and the proportion of

TABLE I—FINDINGS IN CEREBROSPINAL FLUID IN 14 HUMAN CASES OF LEPTOSPIROSIS CANICOLARIS

Case no.	Day of illness	Nonne reaction	Pandy reaction + or –	Conc. of phenol solution %	Sugar content	Cells per c.mm.	Mono-nuclear cells %
1	7 9	+ tr.	+ +	5 4	Low Normal	2450 497	33 35
2	4	–	+	8	Normal	12	40
3	7 9	tr. tr.	+ +	4 6·5	Low Low	836 14	90 100
4	7 11	tr. tr.	+ +	6·5 6·5	Normal Normal	2408 150	70 84
5	7 9	tr. tr.	+ +	8 6·5	Normal Normal	208 63	28 20
6	7	–	–	..	High	26	16
7	8	tr.	+	6·5	Low	440	50
8	7 9	tr. tr.	+ +	5 6·5	Low Low	1540 107	0 98
11	8 11	+ +	+ +	5 7	Normal Normal	1600 320	10 75
12	8 9	+ +	+ +	7 8	Normal Normal	1040 1368	20 10
13	10	tr.	+	7	Normal	128	47
14	13	tr.	+	8	Normal	120	22
15	5 7	tr. tr.	+ +	7 7	Normal Normal	15 1336	60 28
16	8	+	+	5	Normal	960	7

mononuclears ranged from 6 to 100%. Segmented and mononuclear cells predominated, with about equal frequency; hence the condition could not justly be termed a lymphocytic meningitis.

Urine

The urine contained albumin in 10 cases and urobilin in 9. In 6 cases a few erythrocytes, and in 3 cases hyaline casts, appeared temporarily in the sediment. In 7 of the 14 patients we observed a moderate oliguria (less than 1 litre a day with normal fluid intake) lasting from a few days to a week, with poorly concentrated urine (sp. gr.: below 1·015). The chloride content of the urine was low in 5 cases. No bilirubinuria was found.

Blood

In 13 of the 14 patients the blood-urea level remained from slightly to moderately high (600–1400 mg. per litre) for one to three weeks:

1400 mg./litre in 1 patient	700 mg./litre in 2 patients
1150 ,, ,, 1 ,,	650 ,, ,, 2 ,,
900 ,, ,, 1 ,,	600 ,, ,, 3 ,,
750 ,, ,, 3 patients	

A slightly raised value for the van den Bergh indirect reaction was found in 4 patients only (1·0, 1·4, 1·2, and 1·2 units). Possibly we might have obtained more pathological readings if we had done the tests at an earlier stage. In many cases, however, it was not until the disease was far advanced that we were led to suspect leptospirosis. Since we have adopted the routine of testing the blood of all patients with serous meningitis for bile pigments, even when there is no question of leptospirosis, we have found increased values in many cases; this applies also to blood-urea. Thus high values for the van den Bergh reaction and the blood-urea level do not help in the differential diagnosis of the various forms of serous meningitis.

In most cases we found the chloride content of the serum to be lowered:

345–385 mg. per 100 ml.	8 patients
400 ,, ,, ,, ...	2 ,,
533–562 ,, ,, ,, ...	2 ,,
540–585 ,, ,, ,, ...	2 ,,

The erythrocyte-sedimentation rate (E.S.R.) remained high to very high for a considerable time (14–109 days after admission to hospital):

E.S.R. on admission (mm. in 1 hr.) ..	68	72	60	65	100	48	42	25	72	40	22	17	94	86
Days to become normal	?	41	37	37	109	71	34	30	73	14	14	60	90	28

The white-cell counts ranged from 6100 to 16,000 per c.mm. There was a pronounced shift to the left in 4 cases, and lymphopenia in 3. The eosinophils in the 14 cases were 0% in 9 cases, 3% in 1 case, 4% in 3 cases, and 12% in 1 case.

Liver

Owing to shortage of staff it was impossible to carry out liver-function tests on all the patients; in some cases where such tests were made they revealed distinct functional disturbance.

Relapses

In 4 cases there were relapses (on the 14th–17th day) which lengthened the illness by 12–33 days.

TABLE II—BACTERIOLOGICAL AND SEROLOGICAL FINDINGS IN 17 HUMAN CASES OF LEPTOSPIROSIS CANICOLARIS

Case no	Day of disease	Examination for leptospira in—			Serological reactions with leptospira strains					
		urine	blood d.-c.	blood g.-p.	Ictero-hæmorrhagiæ		Canicola	Grippo-typhosa	Ballum	Sejroe and pomona
					Antigen A	Antigen AB				
1	7 14 21	.. – ..	–	–	1:100 1:1000 1:1000	1:30 1:30 1:100	1:100 1:1000 1:30,000	– 1:100 1:100	– – –	– – –
2	4 14 20	.. .. ..	–	+	.. 1:100 1:100	.. – –	.. 1:3000 1:10,000	.. 1:10 –	.. – 1:100	.. – –
3	15 130	.. ..	.. ..	.. ..	1:3000 1:300	1:1000 1:30	1:3000 1:1000	– –	– 1:100	– –
4	10 20	.. ..	.. ..	.. ..	1:1000 1:100	1:1000 1:100	1:300 1:3000	– –	– 1:100	– –
5	12 20 43	.. – ..	.. .. ..	.. .. ..	1:3000 .. 1:300	1:3000 .. 1:300	1:1000 .. 1:3000	– .. –	1:100 .. 1:3000	– .. –
6	8 11 21 28	.. .. – ..	–	+	.. 1:30 .. 1:300	.. 1:10 .. 1:300	.. 1.300 .. 1:10,000	.. 1:100 .. –	.. 1:100 .. 1:3000	.. – .. –
7	12 20	.. –	.. ..	.. ..	– –	– –	1:300 1:1000	– –	– –	– –
8	8 20 26	.. .. ..	.. .. ..	.. .. ..	1:100 1:1000 1:300	1:300 1:10 1:10	1:300 1:3000 1:10,000	– – –	– 1:1000 1:1000	– – –
9	13 53	.. ..	.. ..	.. ..	1:300 1:300	1:300 1:300	1:3000 1:3000	.. ..	.. ..	.. ..
10	15	..	..	..	1:300	..	1:1000	..	..	..
11	8 17 25	.. .. ..	–	–	– 1:3000 1:300	– 1:300 1:100	– 1:3000 1:10,000	– – –	– – 1:100	– – –
12	8 22 37	.. .. ..	–	–	– 1:1000 1:300	– 1:30 1:10	– 1:3000 1:3000	– – –	– 1:300 1:300	– – –
13	8 11 21 90	.. ..	.. ..	.. ..	1:10 1:100 1: 300 1:30	– 1:30 1:10 1:10	1:100 1:300 1:1000 1:1000	– – – –	– – 1:10 1:30	– – – –
14	10 86	.. ..	.. ..	.. ..	1.300 1:10	1:100 1:10	1:1000 1:300	– –	1:300 1:30	– –
15	4 14	.. ..	– ..	+ ..	– 1:1000	– 1:1000	– 1:10,000	– –	– 1.100	– –
16	9 15	.. ..	.. ..	.. ..	1:100 1:1000	1:100 1:300	1:100 1:3000	– –	– –	– –
17	12 20	.. ..	.. ..	.. ..	– 1:300	– 1:300	1:30 1:10,000	– –	– –	– –

d.-c.=direct culture; g.-p.=guineapig.

TREATMENT AND PROGRESS

Treatment was symptomatic. Penicillin was at that time in short supply, so we did not feel justified in using it, though it has been shown by tests on animals and in vitro to be active against *L. canicola* [29, 27, 30] and has been recommended by Baber and Stuart [2] for human cases.

Many of the patients in the series recovered extremely slowly ; some of them did not feel well for many weeks or even months. The serious complications that have been reported,[5] such as myocarditis, uræmia, and paralysis, were not seen in this group, and only 1 patient developed pneumonia.

In 1 case the leptospirosis ran such a mild course as almost to deserve the designation *infection inapparente.* The patient merely felt slightly unwell for two days.

BACTERIOLOGICAL AND SEROLOGICAL TESTS

Table II shows the results of laboratory tests in all the cases. Attempts to culture leptospira directly from the blood and cerebrospinal fluid of the patients were made in only a few cases, because in several cases there were few if any grounds for suspecting leptospirosis in the beginning, and in others the disease was too far advanced by the time they were admitted to hospital. A further difficulty was the great shortage of guineapigs of suitable weight (150–200 g.).

The rise in titre of the sera with canicola strains was sometimes perceptible in the second week but often not until the fourth week of the illness or later. The classical Weil strains usually showed a high degree of co-agglutination, especially with antigen A ; this was most pronounced during the first weeks of the illness. In some cases it was found necessary to confirm the diagnosis by a Ruys and Schüffner absorption test.[24] The strain, *L. ballum,* cultured in 1941 by Schüffner from an albino mouse and in 1944 by Petersen [10] from *Mus musculus spicilegus,* often showed distinct co-agglutination with the sera from the canicola patients, though this was seldom observed with sera from patients with Weil's disease. The strains *L. pomona, L. sejroe,* and *L. grippo-typhosa* showed little or no agglutination.

TABLE III—FINDINGS IN DOGS WHICH INFECTED HUMAN PATIENTS

Case no.	Dog	Leptospira in urine	Agglutination and lysis reactions in dogs		
			L. icterohæmorrhagiæ		*L. canicola*
			Antigen A	Antigen AB	
1	–	..	..	..	..
2	–	..	..	..	..
3	+	+	1 : 100	1 : 1000	1 : 10,000
4	+	+	1 : 300	1 : 100	1 : 30,000
5	+	+	1 : 300	1 : 300	1 : 30,000
6, 7, 9, 10	+	+	1 : 30	1 : 30	1 : 10,000
	+	+	–	–	1 : 10,000
	+	+	–	–	1 : 1000
	+	+	–	–	1 : 1000
	+	+	1 : 10	–	1 : 3000
	+	+	1 : 10	–	1 : 3000
	+	–	–	1 : 30	1 : 1000
11	+	+	1 : 300	1 : 30	1 : 10,000
	+	+	1 : 100	1 : 100	1 : 3000
	+	+	Not examined	..	..
12	+	+	1 : 1000	1 : 300	1 : 10,000
13, 14, 15, 16, 17	+	+	–	–	1 : 3000

In case 8 the dog was not examined.

DIFFERENTIAL DIAGNOSIS

Leptospirosis canicolaris cannot be diagnosed without bacteriological or serological tests. As a rule, differential diagnosis by clinical means from poliomyelitis without paralysis, from meningitis due to mumps without any affection of the glands, and from Armstrong's lymphocytic meningitis—to mention only a few examples—is impossible. The complement-fixation test with mumps antigen is not decisive until the convalescent phase has been reached, and the effect of cerebrospinal fluid injected intracerebrally into mice requires ten to fourteen days for confirmation—or the reverse—of a diagnosis of lymphocytic meningitis.

The most we can do clinically is to suspect leptospirosis. If the patient has been ill for less than eight days there is a fair chance of cultivating leptospira in the guineapig or hamster or on Vervoort's medium within a further three to seven days, after which the type can be determined serologically. For this purpose 4·5 ml. of blood should be used, mixed with 0·5 ml. of 1% sterile sodium oxalate solution buffered to pH 8. If the patient has been ill for longer than eight days it will be necessary to wait until the 10th–14th day before agglutinins and lysins for leptospira can be expected to be detectable. In many cases several weeks elapse before it is possible to decide for which leptospira type the patient possesses the most antibodies. Thus, as a rule, the diagnosis cannot be established until convalescence is far advanced, and then only with the assistance of a skilled bacteriologist with special equipment. From the clinical point of view all forms of leptospirosis (Weil's disease, canicola fever, swineherd's or pomona fever, mud fever, rice-field fever, Batavia fever, &c.) run a precisely similar course.

SOURCE OF INFECTION

In 23 of the 49 cases recognised in Amsterdam the dog responsible for transmitting the infection was traced ; these cases included 14 of the 17 discussed here. The results of examination of these dogs are given in table III. In connexion with cases 6, 7, 8, and 10 it was found that a bitch and her six puppies were all infected. We observed leptospira in the urine of these animals for many weeks. At least one of them died. (In 19 human contacts of this canine family, not mentioned above, no agglutinins or lysins against *L. canicola* could be found.) Unfortunately we were not in a position to ascertain whether the serum of these dogs contained antibodies causing agglutination or lysis of *L. ballum.*

Experiments on a restricted scale were made with one dog in the hope of ascertaining the effect of penicillin on the leptospiruria. After 25,000 units twice daily on two successive days the leptospiræ in the urine were temporarily much reduced in number and agglutinated spontaneously.

SUMMARY

At the Institute of Tropical Hygiene in Amsterdam 49 cases of febris canicolaris have been diagnosed since 1933 (6 with jaundice, 1 ending fatally).

The symptoms and bacteriological and serological data of 17 cases observed from the summer of 1946 to the autumn of 1947 in the Wilhelmina Hospital in Amsterdam are described.

In 14 cases of this group the sources of infection were traced by means of bacteriological and serological examination of the urine and serum of canine contacts.

The laboratory tests from which table II is compiled were done by Miss H. Bohlander at the Institute of Tropical Hygiene, Amsterdam.

References at foot of next column

MALARIAL DIABETES

REPORT OF A CASE

LEO RAU
M.R.C.P.

It has long been known that malaria produces different clinical syndromes according to its incidence in different organs—e.g., cerebral malaria, malarial dysentery, &c. Manson-Bahr (1946) mentions acute hæmorrhagic pancreatitis caused by a blockage of capillaries by *Plasmodium falciparum*. Cerebral malaria is sometimes wrongly diagnosed as heat-stroke, sun-stroke, heat-exhaustion, and often ends in fatal coma, and the true diagnosis is established by the discovery of malarial parasites in the blood capillaries. On the other hand, latent malarial infection without clinical symptoms of sufficient gravity to attract attention is often missed. In the following case the latent malaria seemed at first to be of no clinical significance.

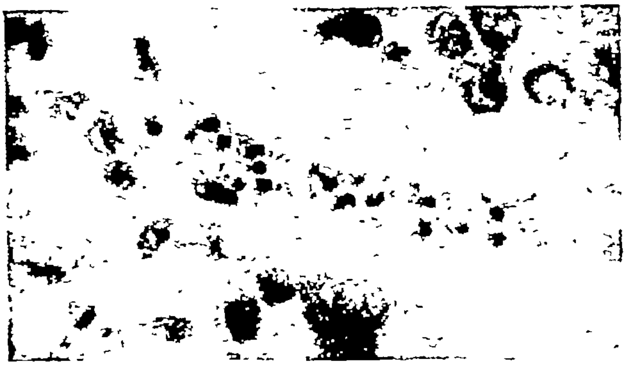
A married man, aged 43, returned from India in June, 1947, after six years there. In the middle of July he noticed frequency of micturition and excessive thirst, and he found his weight had fallen from 13st. 11 lb. to 10 st. 13 lb. There was no pyrexia at this time. The only disease of significance in his past history was malaria, which he had had at the age of 19. In January, 1947, he had had an attack of difficulty in breathing. He was a member of a large family in which neither hereditary nor any other disease had been noted.

On examination on Aug. 21 his temperature was normal, pulse-rate 66 per min., and blood-pressure 110/70 mm. Hg. The patient appeared ill but not pale. There was no cyanosis, no dyspnœa, and no jaundice of skin or mucosæ. The pupils reacted to light and accommodation, the fundi and ocular movements were normal. The tongue was moist, not furred. Nothing abnormal was detected in his abdomen; spleen and liver were not felt. Central nervous system normal. Urine: sp. gr. 1·030, no albumin, sugar ++, no acetone, no diacetic acid. Blood film: ring forms of malignant tertian (M.T.) malaria present. Next day his fasting blood-sugar was 350 mg. per 100 ml. On the 24th he became worse. Urine: sugar +++, acetone ++, diacetic acid ++. Fasting blood-sugar 350 mg. per 100 ml. He had a headache and felt drowsy and sleepy. He could not walk unaided. Treatment with insulin (30 units three times daily) and a diet of 2500 calories was begun. On the 25th his fasting blood-sugar had dropped to 182 mg. per 100 ml. and on the 28th he was much improved. Urine: sugar trace. Fasting blood-sugar 170 mg. per 100 ml.

During the next two weeks the patient remained fairly well His urine was free from sugar, but his fasting blood-sugar level was still raised.

On Sept. 12 his condition was still satisfactory. The insulin had been reduced to 30 units twice daily, leading to the reappearance of sugar in the urine. On this day he was given 'Paludrine' 0·1 g. twice daily for ten days. On the 22nd the urine was sugar-free although the diet was unchanged at 2500 calories a day, and the insulin dosage was still 30 units a day.

On Oct. 9 the urine remained sugar-free, and the fasting blood-sugar was 104 mg. per 100 ml. On Oct. 31 he was no longer on a restricted diet and was not receiving any insulin. During the next three months his urine on weekly examination was always sugar-free.



Section of pancreas through islets of Langerhans showing a blood-vessel blocked by red blood-cells containing malarial pigment. (× 900.)

On Feb. 18, 1948, the sugar-tolerance test after 50 g. of glucose was as follows:

	Fasting	*45 min.*	*90 min.*	*150 min.*
Blood-sugar (mg. per 100 ml.)	93	104	120	86

Urine sugar-free throughout.

COMMENT

There is reason to believe that this glycosuria was caused by a pathological condition of the islets of Langerhans. All tests and the response to insulin and diet confirm this.

Renal glycosuria and diabetes occur in tropical countries, but de Langen and Lichtenstein (1936) remark that "Glycosuria in the tropics is never caused by malaria, and diabetes is a rare disease, occurring in 1 : 11,000 patients only." Ash and Spitz (1945) do not mention any abnormality of the pancreas in malaria. Seyfarth (1926) and Gruber (1929) emphasise the possibility of malaria in the islets of Langerhans and suggest it as a possible cause of diabetes.

In the present case the diabetes was evidently caused by M.T. malaria of the islets of Langerhans, and was apparently cured by specific antimalarial treatment. Prof. R. J. V. Pulvertaft, with whom I discussed this case, showed me sections of islets of Langerhans in which the capillaries were completely blocked by red blood corpuscles loaded with M.T. plasmodia. These sections were obtained for the following cases, observed by Professor Pulvertaft:

The first case which came to his notice was that of a flight-lieutenant who was admitted to a Service hospital in Cairo immediately after arriving from West Africa by air. He complained of vague malaise, was foolish in his manner, and did not seem to know where he was. He was thought to be suffering from the effects of some drug. During his first night in hospital he was found dead. Necropsy revealed an enormous spleen, and all the organs were full of parasites

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TREATMENT AND PROGRESS

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BACTERIOLOGICAL AND SEROLOGICAL TESTS

Table II shows the results of laboratory tests in all the cases. Attempts to culture leptospira directly from the blood and cerebrospinal fluid of the patients were made in only a few cases, because in several cases there were few if any grounds for suspecting leptospirosis in the beginning, and in others the disease was too far advanced by the time they were admitted to hospital. A further difficulty was the great shortage of guineapigs of suitable weight (150–200 g.).

The rise in titre of the sera with canicola strains was sometimes perceptible in the second week but often not until the fourth week of the illness or later. The classical Weil strains usually showed a high degree of co-agglutination, especially with antigen A; this was most pronounced during the first weeks of the illness. In some cases it was found necessary to confirm the diagnosis by a Ruys and Schüffner absorption test.[24] The strain, *L. ballum*, cultured in 1941 by Schüffner from an albino mouse and in 1944 by Petersen [19] from *Mus musculus spicilegus*, often showed distinct co-agglutination with the sera from the canicola patients, though this was seldom observed with sera from patients with Weil's disease. The strains *L. pomona*, *L. sejroe*, and *L. grippo-typhosa* showed little or no agglutination.

TABLE III—FINDINGS IN DOGS WHICH INFECTED HUMAN PATIENTS

Case no.	Dog	Lepto-spira in urine	Agglutination and lysis reactions in dogs		
			L. icterohæmorrhagiæ		*L. canicola*
			Antigen A	Antigen AB	
1	−	..	..	..	..
2	−	..	..	..	..
3	+	+	1 : 100	1 : 1000	1 : 10,000
4	+	+	1 : 300	1 : 100	1 : 30,000
5	+	+	1 : 300	1 : 300	1 : 30,000
6, 7, 9, 10	+	+	1 : 30	1 : 30	1 : 10,000
	+	+	−	−	1 : 10,000
	+	+	−	−	1 : 1000
	+	+	−	−	1 : 1000
	+	+	1 : 10	−	1 : 3000
	+	+	1 : 10	−	1 : 3000
	+	−	−	1 : 30	1 : 1000
11	+	+	1 : 300	1 : 30	1 : 10,000
	+	+	1 : 100	1 : 100	1 : 3000
	+	+	Not examined	..	..
12	+	+	1 : 1000	1 : 300	1 : 10,000
13, 14, 15, 16, 17	+	+	−	−	1 : 3000

In case 8 the dog was not examined.

DIFFERENTIAL DIAGNOSIS

Leptospirosis canicolaris cannot be diagnosed without bacteriological or serological tests. As a rule, differential diagnosis by clinical means from poliomyelitis without paralysis, from meningitis due to mumps without any affection of the glands, and from Armstrong's lymphocytic meningitis—to mention only a few examples—is impossible. The complement-fixation test with mumps antigen is not decisive until the convalescent phase has been reached, and the effect of cerebrospinal fluid injected intracerebrally into mice requires ten to fourteen days for confirmation—or the reverse—of a diagnosis of lymphocytic meningitis.

The most we can do clinically is to suspect leptospirosis. If the patient has been ill for less than eight days there is a fair chance of cultivating leptospira in the guineapig or hamster or on Vervoort's medium within a further three to seven days, after which the type can be determined serologically. For this purpose 4·5 ml. of blood should be used, mixed with 0·5 ml. of 1% sterile sodium oxalate solution buffered to pH 8. If the patient has been ill for longer than eight days it will be necessary to wait until the 10th–14th day before agglutinins and lysins for leptospira can be expected to be detectable. In many cases several weeks elapse before it is possible to decide for which leptospira type the patient possesses the most antibodies. Thus, as a rule, the diagnosis cannot be established until convalescence is far advanced, and then only with the assistance of a skilled bacteriologist with special equipment. From the clinical point of view all forms of leptospirosis (Weil's disease, canicola fever, swineherd's or pomona fever, mud fever, rice-field fever, Batavia fever, &c.) run a precisely similar course.

SOURCE OF INFECTION

In 23 of the 49 cases recognised in Amsterdam the dog responsible for transmitting the infection was traced; these cases included 14 of the 17 discussed here. The results of examination of these dogs are given in table III. In connexion with cases 6, 7, 8, and 10 it was found that a bitch and her six puppies were all infected. We observed leptospira in the urine of these animals for many weeks. At least one of them died. (In 19 human contacts of this canine family, not mentioned above, no agglutinins or lysins against *L. canicola* could be found.) Unfortunately we were not in a position to ascertain whether the serum of these dogs contained antibodies causing agglutination or lysis of *L. ballum*.

Experiments on a restricted scale were made with one dog in the hope of ascertaining the effect of penicillin on the leptospiruria. After 25,000 units twice daily on two successive days the leptospiræ in the urine were temporarily much reduced in number and agglutinated spontaneously.

SUMMARY

At the Institute of Tropical Hygiene in Amsterdam 49 cases of febris canicolaris have been diagnosed since 1933 (6 with jaundice, 1 ending fatally).

The symptoms and bacteriological and serological data of 17 cases observed from the summer of 1946 to the autumn of 1947 in the Wilhelmina Hospital in Amsterdam are described.

In 14 cases of this group the sources of infection were traced by means of bacteriological and serological examination of the urine and serum of canine contacts.

The laboratory tests from which table II is compiled were done by Miss H. Bohlander at the Institute of Tropical Hygiene, Amsterdam.

References at foot of next column

MALARIAL DIABETES

REPORT OF A CASE

LEO RAU
M.R.C.P.

It has long been known that malaria produces different clinical syndromes according to its incidence in different organs—e.g., cerebral malaria, malarial dysentery, &c. Manson-Bahr (1946) mentions acute hæmorrhagic pancreatitis caused by a blockage of capillaries by *Plasmodium falciparum*. Cerebral malaria is sometimes wrongly diagnosed as heat-stroke, sun-stroke, heat-exhaustion, and often ends in fatal coma, and the true diagnosis is established by the discovery of malarial parasites in the blood capillaries. On the other hand, latent malarial infection without clinical symptoms of sufficient gravity to attract attention is often missed. In the following case the latent malaria seemed at first to be of no clinical significance.

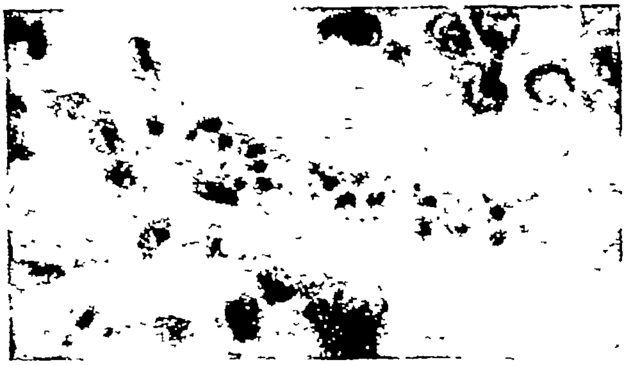
A married man, aged 43, returned from India in June, 1947, after six years there. In the middle of July he noticed frequency of micturition and excessive thirst, and he found his weight had fallen from 13st. 11 lb. to 10 st. 13 lb. There was no pyrexia at this time. The only disease of significance in his past history was malaria, which he had had at the age of 19. In January, 1947, he had had an attack of difficulty in breathing. He was a member of a large family in which neither hereditary nor any other disease had been noted.

On examination on Aug. 21 his temperature was normal, pulse-rate 66 per min., and blood-pressure 110/70 mm. Hg. The patient appeared ill but not pale. There was no cyanosis, no dyspnœa, and no jaundice of skin or mucosæ. The pupils reacted to light and accommodation, the fundi and ocular movements were normal. The tongue was moist, not furred. Nothing abnormal was detected in his abdomen; spleen and liver were not felt. Central nervous system normal. Urine: sp. gr. 1·030, no albumin, sugar ++, no acetone, no diacetic acid. Blood film: ring forms of malignant tertian (M.T.) malaria present. Next day his fasting blood-sugar was 350 mg. per 100 ml. On the 24th he became worse. Urine: sugar +++, acetone ++, diacetic acid ++. Fasting blood-sugar 350 mg. per 100 ml. He had a headache and felt drowsy and sleepy. He could not walk unaided. Treatment with insulin (30 units three times daily) and a diet of 2500 calories was begun. On the 25th his fasting blood-sugar had dropped to 182 mg. per 100 ml. and on the 28th he was much improved. Urine: sugar trace. Fasting blood-sugar 170 mg. per 100 ml.

During the next two weeks the patient remained fairly well His urine was free from sugar, but his fasting blood-sugar level was still raised.

On Sept. 12 his condition was still satisfactory. The insulin had been reduced to 30 units twice daily, leading to the reappearance of sugar in the urine. On this day he was given 'Paludrine' 0·1 g. twice daily for ten days. On the 22nd the urine was sugar-free although the diet was unchanged at 2500 calories a day, and the insulin dosage was still 30 units a day.

On Oct. 9 the urine remained sugar-free, and the fasting blood-sugar was 104 mg. per 100 ml. On Oct. 31 he was no longer on a restricted diet and was not receiving any insulin. During the next three months his urine on weekly examination was always sugar-free.



Section of pancreas through Islets of Langerhans showing a blood-vessel blocked by red blood-cells containing malarial pigment. (× 900.)

On Feb. 18, 1948, the sugar-tolerance test after 50 g. of glucose was as follows:

	Fasting	*45 min.*	*90 min.*	*150 min.*
Blood-sugar (mg. per 100 ml.)	93	104	120	86

Urine sugar free throughout.

COMMENT

There is reason to believe that this glycosuria was caused by a pathological condition of the islets of Langerhans. All tests and the response to insulin and diet confirm this.

Renal glycosuria and diabetes occur in tropical countries, but de Langen and Lichtenstein (1936) remark that "Glycosuria in the tropics is never caused by malaria, and diabetes is a rare disease, occurring in 1 : 11,000 patients only." Ash and Spitz (1945) do not mention any abnormality of the pancreas in malaria. Seyfarth (1926) and Gruber (1929) emphasise the possibility of malaria in the islets of Langerhans and suggest it as a possible cause of diabetes.

In the present case the diabetes was evidently caused by M.T. malaria of the islets of Langerhans, and was apparently cured by specific antimalarial treatment. Prof. R. J. V. Pulvertaft, with whom I discussed this case, showed me sections of islets of Langerhans in which the capillaries were completely blocked by red blood corpuscles loaded with M.T. plasmodia. These sections were obtained for the following cases, observed by Professor Pulvertaft:

The first case which came to his notice was that of a flight-lieutenant who was admitted to a Service hospital in Cairo immediately after arriving from West Africa by air. He complained of vague malaise, was foolish in his manner, and did not seem to know where he was. He was thought to be suffering from the effects of some drug. During his first night in hospital he was found dead. Necropsy revealed an enormous spleen, and all the organs were full of parasites

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DISCUSSION

These are the third and fourth recorded cases of a typical pilonidal sinus in a barber's hand, and it seems impossible to avoid the conclusion that the pilonidal sinus was an acquired condition and due to the penetration of hair clippings. A similar mechanism of origin must therefore be admitted as a possibility in the postanal region. If pilonidal sinus is an acquired infective condition, there are two phases in its development: (1) an initial phase in which organisms are introduced into the tissues, there to give rise to the infection leading to the sinus; and (2) the entrance of hairs into the sinus to produce the foreign-body granulomatous reaction. Subsequent epithelisation of the sinus from the surface in part or in whole may or may not take place, and the same applies to secondary abscess and sinus formation. In the case of the barber's hands hair seems to be concerned with both phases of development.

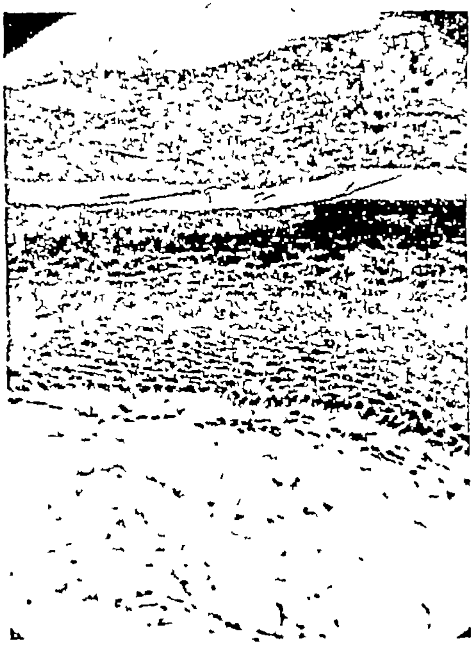

Fig. 3—Squamous lining of pilonidal sinus. (×200.)

But pilonidal sinus—i.e., a foreign-body granuloma round hair—may still develop even if the original mechanism of introduction of infection is not penetration by a hair. In the postanal region, for example, the infection often seems to start at the base of a hair follicle. The main fact requiring explanation on the acquired theory of pilonidal sinus is why hairs tend to enter sinuses substantially in two situations only—the web of the fingers, and the upper end of the postanal cleft. Such an explanation is particularly necessary for the postanal region, because only a short distance away anal and ischiorectal sinuses show no tendency to become pilonidal.

A possible explanation is that the hairs enter the sinus not by being pushed in but by being sucked in. If a simple experiment is made with a rubber bulb with a narrow orifice, it will not be found easy to introduce a long soft hair into the bulb by pushing the hair; but, if after the hair has been partly introduced, a sudden negative pressure is created in the bulb, the hair tends to be sucked in with great ease. We therefore suggest that the reason why sinuses in the webs of the fingers and near the postanal cleft tend to become pilonidal is that in these regions negative pressures are readily produced: in the webs of the fingers by the alternating tautening and loosening of the tissues during movements of the fingers; and near the postanal cleft by the alternating pressure and relaxation of the soft tissues against the coccyx and sacrum during sitting. It was a current idea in the American army that driving for a long time in motor vehicles with hard seats predisposed to pilonidal sinus, and a popular name for the condition was "jeep disease."

As regards treatment we suggested in our previous article[1] that operation in a field made hairless by irradiation should help to prevent recurrence. Further, if our present view is correct, an essential principle of surgical technique should be to secure adhesion of the skin and subcutaneous tissue flaps to the deep fascia so as to avoid a sucking wound. And this principle should apply whether the wound is allowed to granulate and epithelise secondarily or whether one of the many techniques aiming at primary union is used.

Medical Societies

BRITISH ASSOCIATION OF UROLOGICAL SURGEONS

THE annual meeting was held in London on June 24, 25, and 26.

Surgery of Urethral Stricture

In opening the discussion on June 24, with Mr. WALTER GALBRAITH, president of the section of urology of the Royal Society of Medicine, in the chair, Mr. H. L. ATTWATER remarked that urethral strictures were becoming less common, and he emphasised their very slow and insidious development. Only 5% occur within 5 years of the original infection and the average latent interval is 25½ years. Dilatation as a method of treatment has been tried for at least 3000 years. In applying it two important principles must be observed—extreme gentleness in instrumentation and regular repetition of the treatment for the rest of the patient's life—"*once a stricture, always a stricture.*" But dilatation *is not* always successful. Failure may be due to extreme density of the stricture, acute sepsis, calculi, irritable stricture, and the inability of the patient to stand the discomfort or pain of repeated dilatation. Resilient stricture is rare, and its appearances are often caused by muscular spasm; such cases are best treated by continuous dilatation. Impassable and impermeable strictures are a definite indication for surgical measures. In acute retention it is important to use very little urethral instrumentation since severe reactions and uræmia are easily caused. A suprapubic cystostomy should be done judiciously soon.

Traumatic lesions of the urethra are of three main types—those due to direct wounding, those due to perineal bruising (as in falling astride), and those associated with fractured pelvis. In the immediate treatment of these injuries it is permissible to attempt catheterisation very gently. If this fails it is often necessary to drain the bladder suprapubically and leave the local treatment of the injury until later, because of the severe shock often present. But in rupture of the urethra with fractured pelvis an immediate repair is necessary to avoid the development of a serious obstruction which it would be very difficult to put right. If delayed operation becomes necessary for any of these types of case it is important to wait until all local complications and sepsis are over. A preliminary intravenous pyelogram may be very helpful in showing the exact site and form of the lesion. A new type of traumatic stricture is that due to endoscopic prostatic surgery. It has been calculated that in an average resection the instrument is moved 800 times in the urethra and it is therefore obvious what chances there are for injury. For the stricture due to chronic prostatitis dilatation is often satisfactory but the retropubic approach may be a new answer to this problem as it has been to that of postprostatectomy stricture.

In the female urethral stricture is commoner than is generally supposed and it is a serious condition. This would be expected, for in the male a stricture becomes progressively more serious as its site approaches the bladder, and the female urethra corresponds with the posterior urethra of the male.

When local infective complications arise at a stricture it is better to do a *suprapubic cystostomy* (and treat the stricture by dilatation later) than to make a local surgical attack on the lesion. External urethrotomy is seldom done *nowadays, recontraction* of the stricture being likely to follow. The Syme operation demands a passable stricture, which is better treated by other means. The Wheelhouse operation is preferable, but it is very difficult to trace the lumen through the actual stricture with or without the help of methylene-blue, and it is also difficult to find the urethra proximal to the stricture without retrograde instrumentation. The Loughnane operation is very useful; in it no attempt is made to trace the lumen through the stricture, which is simply bypassed by a catheter buried alongside it and lying in the urethra above and below. This false passage becomes epithelialised from each end and is subsequently treated by dilatation. Internal urethrotomy is not satisfactory —it seldom leads to lasting results and may even make the stricture worse—but it may be useful when a quick result is necessary, in true resilient stricture, and in patients who cannot attend regularly for dilatation. When it is possible to remove all the affected tissue (and particularly in single traumatic strictures of the perineal urethra) excision is probably the best treatment. It is necessary to do preliminary cystostomy and a free mobilisation of the urethra above and below the stricture, a procedure made safe by the vascularity of these tissues. If a gap has to be left it can usually be bridged by a catheter. Strictures of the prostatic and membranous urethra may be treated by a combination of excision and dilatation. In the perineal approach to these strictures great care must be taken not to damage the external sphincters.

Mr. **Terence Millin** described in detail the excision of strictures of the bulb. Before operation both ascending and descending urethrograms should be obtained and the plates superimposed so as to define exactly both limits of the stricture. As much as 6 cm. of stricture may be excised and there must be no tension on the suture line. No indwelling catheter should be left after operation. Patients treated thus may remain potent.

Dr. **Leander** (Stockholm) said that the worst strictures are those due to badly treated intrapelvic rupture of the urethra with fractured pelvis. He advocated a perineal operation, of which the three main principles are to excise all fibrosis, to mobilise the urethra thoroughly, and to leave no dead space under the skin.

Mr. **W. S. Mack** (Glasgow) presented figures showing that gonorrhœal stricture is becoming more common compared with ten years ago. Cases of "non-specific urethritis" may in reality be gonorrhœa treated with penicillin or a sulphonamide, and stricture may follow. Dilatation should be the standard treatment of stricture but operation is sometimes necessary and he is quite partial to internal urethrotomy. Excision (Marian's operation) is usually practicable only in traumatic stricture, since it is impossible to excise all the fibrosis left by inflammation. Stricture of the external meatus often involves the terminal urethra as well and cannot be treated by meatotomy. He creates an artificial hypospadias just proximal to the glans. Dilatation is useless.

Mr. **H. H. Stewart** (Bradford) described general contracture of the penile urethra and an operation he has devised for it similar to the Ombrédanne operation for hypospadias. This operation can only be done in patients with a foreskin. Potency is retained.

Mr. **H. P. Winsbury-White** (London) re-emphasised the importance and severity of strictures in the female.

Mr. **Wilfred Adams** (Bristol) recounted a case whose urethra became obliterated from the penoscrotal junction after prostatectomy (not by Mr. Adams).

Mr. **A. W. Badenoch** (London) considered the retropubic approach very difficult for strictures of the posterior urethra, though for the immediate treatment of the injury it may be suitable.

Mr. **E. T. C. Milligan** (London) referred to the work of Hamilton Russell and particularly mentioned his point that it is unnecessary to suture the whole circumference of the urethra in anastomosing after excision. The glands of Littré are mainly in the roof of the urethra, and most strictures are centred here, so internal urethrotomy rests on a sound foundation. He maintained that the indwelling catheter is an important cause of stricture.

Prof. **J. Hellstrom** (Stockholm) described an operation which can be used when it is impossible to find the proximal end of the urethra after excising a stricture. An artificial proximal urethra is constructed, and, when it is established, is anastomosed to the distal end. He uses a similar method for repairing the bile-duct.

Stones in the Kidney and Ureter

Professor **Hellstrom**, opening the discussion on June 25, when Mr. **A. Clifford Morson**, president of the association, was in the chair, compared his results in 1911–34 at Maria Hospital, and from 1940 onwards at Carolinen Hospital. In Sweden renal calculi are common and probably becoming more so. In 1911–14 there were 1244 cases of renal and ureteric calculi and in 1935–38 there were 16,312, and this increase could not be due only to improved diagnosis. Most cases did not require operation. A nutritional factor is probably mainly responsible for the increase in stone. Chemical analysis showed that 63% of stones were composed of oxalates or a mixture of oxalates and phosphates; 22% were classed as infective; 5% each were composed of uric acid and of phosphates; 5% were uncertain. Oxalate stones usually occur in young men, and there is often a history of gastro-intestinal upset. There is no evidence of an abnormally large dietary intake of oxalate. The stones probably originate in a focus of subepithelial calcification which grows, becomes extruded, and is finally detached. Stones due to infection are chiefly caused by urea-splitting organisms. Of 12 cases of hyperparathyroidism 6 had renal stones; the urinary excretion of calcium falls within 24 hours of the removal of the parathyroid tumour and the stones may then shrink.

In the treatment of ureteric calculi Professor Hellstrom is becoming more conservative. He does not agree with an American view that the stone should be removed by operation while it is still in the upper ureter simply to avoid the difficulties of the lower operation. About half of the ureteric stones are passed within a week of the first symptom, but some may remain in the ureter for as long as three years without harm. For stones held up in the lower ureter the midline approach has several advantages. It is important not to tilt the patient until the ureter has been secured above the stone, so as to prevent its slipping up to the kidney.

Reported recurrence-rates after operation for renal calculi range from 2 to 50%. For reliable figures long observation and close follow-up are essential. His own recurrences in 1911–34 totalled 25%, the 86 cases being divided into: fresh calculi on the operated side, 29; fresh calculi on the other side, 17; fresh calculi on both sides, 13; and calculi left behind at operation, 27. He now takes a radiogram of the kidney at operation, using a film in a pliable sterilised casette which can be put into the wound. Most "recurrent" stones result from either leaving behind at operation some minute concretions which later grow into stones, or infection. Blood-clot may be a focus of stone formation, so he advises irrigation before closing the pelvis and very careful hæmostasis. He does not usually drain the kidney. In the postoperative period sulphonamides, penicillin, and streptomycin may all be valuable, and early rising (on the first or second day) is an important preventive of thrombo-embolism. A further radiogram is taken before the patient leaves hospital and if a small stone is seen to remain it may be possible to wash it out with a ureteric catheter. His total mortality-rate is 5%, but since 1940 it has dropped to 1%. Recently the recurrence-rate has been lower than average (18%).

Mr. **Thompson Tait** (Melbourne) described cases of bilateral renal calculi and drew two conclusions—that every case of this sort must be dealt with on its merits, and that it is sometimes possible to benefit the most advanced case by suitable surgery. On the other hand there are cases in which operation is far better avoided.

Mr. **J. M. Ridley Thomas** (Norwich), in a paper on vesical calculus in Norfolk, noted that for centuries this county had an unusually high incidence of bladder stone. Surprisingly good results were sometimes obtained by the early lithotomists. At the beginning of the nineteenth century a surgeon performed 147 lithotomies with only 17 deaths. The records of the Norfolk and Norwich Hospital show that during 1910–30 the incidence of primary vesical calculus, particularly in children, sharply declined and it is now very rare. During these years the agricultural economy of the county changed from grain production to mixed farming and in the influence of this change on the diet of the people Mr. Thomas found the explanation of the disappearance of vesical calculus, the essential agent probably being vitamin A.

Mr. N. J. NICHOLSON (Louth) showed his X-ray apparatus for screening the kidney during calculus operations.

Mr. L. N. PYRAH (Leeds) said that the two factors for the production of calcification in the renal tubules are a high concentration of calcium in the urine and alkalosis. Alkalosis is the predominant factor when calcification occurs in pyloric stenosis and marasmus, whereas a high urinary calcium is the predominant factor in hyperparathyroidism, hypervitaminosis D, and multiple myelomatosis. The process can be studied by overfeeding rats with vitamin D. The calcium is deposited mainly in the tubules of the boundary zone. If the overdose is maintained for only 2–3 days the change is reversible and the calcium is eliminated in the next 12 days. A corresponding reversibility is seen in human hyperparathyroidism, of which Mr. Pyrah has studied 11 cases, 4 of them having renal calculi. In 3 of these cases the stones disappeared spontaneously after the removal of the adenoma. If pyloric stenosis is produced in the cat by tying a ligature round the pylorus, extensive cortical calcification is found when the cat dies after 5 days.

Dr. N. S. CONWAY (Glasgow) has investigated the urinary citrate excretion of patients with renal calculi. The normal urinary citrate excretion is 400–700 mg. a day and is unaffected by diet but is reduced by androgens and increased by a rise in the urinary pH. The average citrate excretion of patients with calculi is only 280 mg. a day; their blood-citrate and renal function are normal. But if these calculous patients are separated into two groups according to the presence or absence of infection in the urine it is found that the uninfected group have an almost normal citrate excretion (average 416 mg.) whereas those with infected calculi excrete on the average only 144 mg. of citrate a day. There is therefore no point in giving œstrogens to patients with sterile calculi.

Mr. WINSBURY-WHITE said that in 63% of cases of stone in the upper urinary tract there is evidence of infection in the genitalia, urethra, or bladder neck. Two important factors in reducing operative mortality for stone are the avoidance of instrumentation shortly before operation, and effective drainage.

Mr. N. O. T. GIBBON (Liverpool) described a case of nephrocalcinosis in a man of 32 who often passed mixed oxalate and phosphate stones and in whom the calcium excretion was three times normal. Giving citrates reduced the calcium excretion by 20%.

Mr. A. H. JACOBS (Glasgow) thought that the dissolution of calculi with buffered citrate solution has a definite place in the treatment of large branching calculi of the upper tract which are very difficult to remove completely by operation. After removing all he can he leaves a nephrostomy tube in the kidney and irrigates it with Suby's solution under repeated control.

Mr. E. W. RICHES (London) has used Suby's solution for treating calculi in paraplegics, but has had much better results in the bladder than in the kidney.

Mr. J. C. ANDERSON (Sheffield) described how a ureteric calculus disintegrated in six months after irrigation with "solution M," which contains twice as much carbonate as "solution G" and is less irritating.

Mr. T. L. CHAPMAN (Glasgow) showed that a small stone recurring after operation for a large stone may be much more serious than an untreated large one.

Mr. BADENOCH has not found "solution G" effective.

Mr. JOHN EVERIDGE (London) emphasised the danger of phosphate stones forming in patients under protracted treatment with alkalis for peptic ulcer and urged that X-ray films should be taken periodically to check this.

Short Papers

The third day was taken up with short papers and films. Dr. LOUIS MICHON (Paris) discussed the repair of exstrophy of the bladder; Mr. T. J. D. LANE (Dublin) described an uncommon blood condition simulating carcinoma; and Mr. HAMILTON BAILEY recalled some urological clinical entities frequently missed.

Reviews of Books

Anatomie Artistique

ARNOULD MOREAUX, membre de la Société des Artistes français. Paris: Maloine. 1947. Pp. 306. Fr. 850.

THE study of anatomy should be that of making "these dry bones live," though unfortunately to many medical students it becomes a static rather than a vital subject. The artist, however, does not depend on cadaver studies in his work, and while making his work active and living he sometimes loses by an imperfect knowledge of anatomy. This work, by an artist who is also an anatomist, has an original and instructive approach: it is a study of bones, joints, and muscles and is treated in such a way that the advanced student of anatomy can see the subject from a fresh angle. The pages are fewer than the illustrations, many of which comprise three or four individual studies. This follows Leonardo da Vinci's precept that an anatomical subject should be drawn from several different aspects which will give a much clearer idea of the subject than pages of written description.

The great value of the book as a whole is that it depicts movement—showing, for example, how and where movements of the vertebral column take place and the range of joint and muscle action. The positions of the arm and shoulder in different actions demonstrate muscular function in a manner seen in few anatomical textbooks, and other parts of the body are displayed in a similar way, bones and muscles being considered as active structures in groups or planes rather than as individual structures.

A return to graphic rather than verbal descriptive anatomy, as demonstrated by M. Moreaux, has much to commend it.

Primer of Cardiology

GEORGE E. BURCH, M.D., F.A.C.P., associate professor of medicine, Tulane University; PAUL REASER, M.D., instructor in medicine in the university. London: H. Kimpton. 1947. Pp. 272. 22*s*. 6*d*.

THE abundance of detail in this book may well confuse the beginner for whom it is intended. The description of gallop-rhythm, for example, is over-elaborate, and the authors might with advantage have borrowed from British work on this subject. In some cases the matter is inconsistent; thus the text states that arsenicals should never be used in syphilitic aortic incompetence, while a table above gives the doses of such drugs to be used in this condition. Again, auricular fibrillation and flutter are given among the pathognomonic signs of organic heart disease but are also said to occur in psychoneuroses. The presentation is designed to make the reader think for himself, and should do so, for every attempt is made—by discussion and illustration—to explain signs and symptoms on a physical and physiological basis.

The Legacy of Swift

Editor: MAURICE CRAIG. Dublin: Sign of the Three Candles, for the Governors of St. Patrick's Hospital 1948. Pp. 70. 5*s*.

IT is a remarkable paradox, but quite in keeping with the man, that Dean Swift, that professed hater of his fellowmen, should be the originator of one of the most beneficent institutions for suffering humanity ever established. But Swift under a grim and cynical crust possessed a deep and compelling sympathy, especially for the mentally afflicted. St. Patrick's Hospital, which he founded, and to which he bequeathed the whole of his fortune, has steadily gone on from strength to strength. It is now one of the foremost institutions of its kind, and, as is here pointed out by Dr. J. N. P. Moore, the present medical superintendent, and by Dr. J. D. H. Widdess, it is fully equipped with the most recent methods for the treatment of the mentally disabled. It is a far cry from the time when mental cases were exhibited, sometimes on payment of a fee, for the amusement or scorn of their barbarous contemporaries. The legacy of Swift has indeed come to fruition and this booklet tells the story of its development in a brief but arresting manner.

THE LANCET

LONDON: SATURDAY, JULY 3, 1948

Our Service

IN shelters, fo'c'sles, barrack-rooms, and other places of common resort, the talk often turned to the shortcomings of society. "But it will be different after the war," we used to say. And in the anxious winter of 1942 BEVERIDGE showed how it might be made different—how the nation could ensure that all its members, whether old or young, ill or unfortunate, should have a basic minimum of food and care. Being older and wiser, we now know that in times like these even social security is insecure; its money benefits would quickly be made worthless by inflation or external bankruptcy, and its stabilising influence in time of trial has to be weighed against its possible effect in discouraging effort when effort is so badly wanted. Moreover, in seeking Freedom from Want one may lose other freedoms, and Britain's recent advances towards Equality and Fraternity have been made at some cost to Liberty. The balance proper to our day and generation is hard to strike, and it may be long before we reach equilibrium. Yet with all these reservations it is certainly a source of strength to a country for its people to feel that, in peace as in war, the necessities of life will be shared according to need; and we can all be proud at least of the impulse behind the legislation that comes into force next Monday.

The new arrangements confer a great benefit on medicine by lessening the commercial element in its practice. Now that everyone is entitled to full medical care, the doctor can provide that care without thinking of his own profit or his patient's loss, and can allocate his efforts more according to medical priority. The money barrier has of course protected him against people who do not really require help, but it has also separated him from people who really do: and only time can show the relative proportions of the two classes. But though, as we hope, removal of this barrier will help to bring medicine to those who need it most, a truly satisfactory application of medical knowledge and resources demands much reorganisation and development both in general and hospital practice. Given time, the rationalisation of hospital services under State ownership should mean real progress in applied medicine, and anyone who has studied the membership of the boards and committees charged with their management must agree that our profession has been given a full opportunity for leadership If we continue to think of the National Health Service as a State service it will fail; but if we recognise it as our own service we can make it a great and increasing success For this we shall require all the sense of duty that training and tradition can inspire, and the result will ultimately depend on the standards of the teaching schools But our tradition is strong because it is a good tradition; and it will prevail

History at Geneva

CLINICIANS generally think of medicine as a personal art: "take care of the patients," they say, "and the populations will take care of themselves" For clinicians this may be right and proper and wise; but it is only penny wisdom if it blinds them to the benefits of the communal approach to health. Similarly a national outlook is pound-foolish if it discourages an international approach that would be for the general good; and only the most perversely insular will deny the immense potential significance of the World Health Assembly which opened in Geneva last week. The constitution of the World Health Organisation was signed two years ago by 61 nations—probably the greatest number that have ever agreed on any set of principles—and the new body is unique among United Nations special agencies in containing representatives of the Soviet republics. To everyone it appeals as a constructive effort; and it is a good basis for working together, because, as the Chinese delegate said, "no nation by gaining health takes it from another."

In our own country the public-health movement arose early last century from recognition that disease in the poorer sections of the community was a peril to all. In the same way the international movement is based first on the fact that "unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a common danger." Today, in a world growing rapidly smaller with the development of transport, there is increasing need of centralised epidemiological information and a central body able to take the kind of action required by last year's cholera epidemic in Egypt. As a defensive organisation W.H.O. assumes functions previously carried out by several others, including the Office International d'Hygiène Publique and the Health Organisation of the League of Nations, and it will also be continuing previous work when it provides us with international standards for drugs and biological products, an international pharmacopœia, and an international classification for diseases and causes of death But although there are obvious advantages in having all these necessary tasks undertaken by a single organisation, there is admittedly nothing very new or exciting about them What is really novel about W.H.O. is the size of its ultimate objective—"the attainment by all people of the highest possible levels of health" Nowadays not only do we know how to prevent the spread of infections, at relatively low cost, but also we know that scientific medicine, wherever it is applied, is capable of greatly increasing the health and strength, and therefore the prosperity, of mankind. The duty laid by its founders on W H.O. is to spread more widely the advantages now enjoyed by relatively few. The old negative conception is thus supplemented by a new positive one, and the World Health Assembly will have to decide exactly where, in this present year of grace, the emphasis should be placed.

Two widely different lines of policy might be followed Some of the participating countries—including some with long experience of international endeavour—believe that W H.O would do well to concentrate at first on the tasks which cannot possibly be undertaken by nations individually—epidemiological information, sanitary conventions, standardisation, and the like. The right course, as they see it, is to proceed quietly with this unspectacular work which may not interest the public but is unquestionably essential and is also inexpensive. At the other end of the scale are countries which see in W.H.O. a means of bringing the resources of science to vast populations now living in medical darkness. From the statement that W.H.O. makes no distinctions of race, political belief, or social condition they deduce that it should direct its gaze towards the East rather than the West, forming regional branches which could undertake big schemes for eradicating tropical diseases, training medical workers, and perhaps even subsidising hospital care. Between these extremes is the compromise policy placed before the assembly by the W.H.O. interim commission which has gone on with the work during the two years that have preceded ratification of the constitution.

Under the able chairmanship of Dr. Andrija Stampar, of Yugoslavia, who was last week unanimously elected president of the World Health Assembly, this commission has not only carried on defensive epidemiological services but has maintained technical missions in many countries and has initiated a very successful scheme of fellowships by which already 250 doctors and other health workers have gone abroad to gain experience or information. The fellowships and missions, which have hitherto been financed from the residual funds of Unrra, must undoubtedly be continued, and the missions ought to be extended to other than Unrra countries. In addition, however, the interim commission suggests that in the immediate future W.H.O. should tackle four major problems—malaria, tuberculosis, venereal disease, and the health of mothers and children. In so doing it would follow the example of the Rockefeller Foundation; rather than embark on large schemes of its own it would help countries to help themselves, and use its experts and its funds as catalysts. To fulfil this compromise programme the interim commission proposes a budget of some 6,500,000 dollars in 1949—a small enough sum when one considers the cost of national medical services or of other agencies of the United Nations. But even this modest demand now seems unlikely to be granted; for in the United States the World Health Organisation has unfortunately come under suspicion as a potential exponent of "socialised medicine," and in ratifying its constitution the Congress has made regrettable reservations, one of which is that the American contribution shall be limited to 1,920,000 dollars per annum while another is that the United States reserves the right to withdraw on a year's notice. If the United States contribution is scaled down, others are likely to be reduced in proportion.

Ratification with reservations is not exactly ratification; and though the U.S. delegation was last week provisionally admitted to full membership of the World Health Assembly its members find themselves in a slightly equivocal position. The U.S.A. has nevertheless set a valuable example by sending to Geneva an exceptionally large number of delegates, including representatives of unofficial bodies such as the American Medical Association. The assembly will have to decide whether in future years non-governmental medical agencies should be entitled to attend as observers—and if so which of them should be invited. Though this may seem a small matter, it is closely related to the question whether W.H.O. is going to remain a smallish official organisation with strictly limited functions, or is going to develop rapidly with the stimulating support from public opinion which it could easily enlist. In such a project, at such a time as this, it is very necessary to keep both feet on the financial ground; yet those responsible for the new venture must be well aware that money usually comes in the end to those who can prove that they would use it profitably. Nowhere more than in international effort is there need of faith, and Dr. Stampar was right in saying that if the World Health Organisation adopts a negative attitude, and does not treat health problems as of global importance, "it is bound to experience setbacks right from the beginning, and we shall gradually lose the faith in it which all of us express at present." In mutual aid between nations, as between individuals, lies our only real hope for the future, and the World Health Organisation has it in its power to play a notable part in the process of civilisation. In President Truman's words, we look to it "with hope and expectation."

Surgical Physiology of the Stomach

The flow of gastric juice is under dual control. There is a psychic flow, produced by the taste, sight, and even thought of food; and a chemical flow, provoked by the arrival of certain foods, particularly meat extracts, in the stomach. The psychic flow results from the passage of nerve impulses down the vagi, and can be imitated by stimulating the vagi electrically or abolished by cutting them. Edkins showed in 1906 that the chemical flow is due to gastrin, a hormone which is formed by pyloric mucosa in contact with appropriate foods and enters the blood-stream to reach the glands of the gastric fundus. The existence of gastrin, for long in doubt, has been confirmed by cross-circulation experiments and by the preparation of the hormone in a considerable degree of purity and free from histamine. It is a protein and is water-soluble. Experimentally it works only on intravenous injection and it stimulates the parietal cells only, the juice produced by its injection being poor in enzyme content. Gastrin is also responsible, as a humoral intermediary, for the psychic flow. Vagal stimulation induces a flow of gastric juice by causing the prepyloric antrum to elaborate gastrin. Thus excision or cocainisation of the prepyloric antrum almost abolishes the nervous flow from the fundus: whereas, if the antrum is isolated with its blood and nerve-supply intact, stimulation of the vagi produces an ample flow from the fundus. Cross-circulation experiments show that stimulation of the vagi of the donor animal will produce a flow of gastric juice in the recipient animal. Such experiments, repeated with a variety of modifications, have yielded the results, negative or positive, which the underlying theory would lead one to expect. Gastrin extracted from the human pylorus and duodenum, when injected into animals, will excite a flow of gastric juice which ceases thirty minutes after the injection. Though injection of purified gastrin will provoke only the parietal cells to activity, vagal stimulation yields gastric juice of full enzyme content. This suggests that the gastrin isolated is only a part of the pyloric antrum hormone and that, like secretin, it will be shown to consist of more than one chemical entity, each responsible for the secretion of an element of the gastric juice. A place for histamine in the control of gastric secretion is suggested by the findings that the fundus of the stomach contains more histamine than the pylorus: that gastric juice contains histamine which does not vary in quantity with the type of stimulus used: and that blood leaving the stomach does not yield histamine in increased quantity. Prof. G. S. KAHLSON, of Lund, who summarised the present knowledge of gastric secretion in a lecture at Guy's Hospital in May, postulates that gastrin liberates histamine locally in the gastric fundus and that histamine is thus the immediate stimulus to the gastric cells, but he would not yet raise this hypothesis to the status of a theory.

It is notoriously dangerous to apply experimental results from animals to the treatment of human beings, because human and animal physiology show subtle but important differences. The limited experimental work on man, however, suggests that man and the laboratory animal control their gastric secretion in the same way and justifies physiological reflections on the surgery of peptic ulcer in man. The aim of surgery is to reduce the flow of gastric juice which is the immediate cause of peptic ulceration: and in theory it should be possible, where medical treatment has failed to relieve symptoms, surgically to weaken or break the physiological chain of gastric secretion in three different places. The vagi might be cut to abolish the psychic flow; the pyloric antrum and duodenum might be removed to ablate the tissues forming gastrin; or the stomach from cardia to pyloric antrum might be resected to put the peptic juice factory out of business. In practice most operations for peptic ulcer make an incomplete attack at more than one point. A vagus resection is incomplete because it tackles only the psychic flow, and some advocates of this operation believe that pyloric antrectomy—for gastric ulcer at any rate—should accompany the vagus resection. Partial gastrectomy attacks the formation of both gastrin and peptic juice, but it does neither completely. How miserably it fails to prevent fresh ulceration if the pylorus must (for technical reasons) be left behind is known to all gastrectomists. The finding that gastrin is also formed in the duodenum might mean that the removal of more duodenum would improve the results of gastrectomy. Many surgeons, but by no means all, believe that very high gastrectomies are the operations of choice: and it is certain that the higher the gastrectomy the greater the destruction of tissues forming gastric juice Nevertheless only total gastrectomy destroys all the cells forming gastric juice and this is the only procedure which will guarantee a patient against recurrent ulceration, though at the cost of a variety of undesirable side-effects, not to mention an increased risk of dying from the cure.

The moral seems to be that an incomplete interruption of the physiological chain of gastric secretion at more than one point gives the best results at present obtainable in the surgery of peptic ulcer. But the surgeon might consider whether removal of more duodenum at gastrectomy would yield better results; and whether redoubled precautions to guard against reflux of food into the duodenal stump would lessen gastrin formation by depriving the duodenum of its physiological stimulus.

B.P. 1948

THE *British Pharmacopœia, 1948*,[1] which will come into force on Sept. 1 and is not yet on sale, is a handsome volume, clothed in scarlet and embellished with gold lettering—a brave attempt to gild a pill of enormous dimensions made up of an astonishingly heterogeneous collection of ingredients. There are about 600 pages of monographs describing drugs and preparations; the 24 appendices, mainly concerned with physical and pharmaceutical chemistry, fill another 200 pages: and it is significant of the scope of the work that the index contains well over 4000 items.

Lists of deletions and additions should not be taken at face value, for here and there a drug is deleted merely because of a minor change of name. Thus ergometrine is apparently "struck off strength," but is immediately reinstated as ergometrine maleate. Similarly about a score of these items are "new" only in a strictly official sense, for such old friends as calamine lotion and emulsion of paraffin oil are like good wine that needs no bush. Again, sodium metabisulphite, an ingredient of half a dozen official injections, is a preservative of interest only to the manufacturing chemist: and terpineol is introduced merely as a perfume for the solution of chloroxylenol. Nevertheless, the status of such compounds is a matter of some moment to the pharmacist. Then in future we must try to say ipomœa when we think of scammony (which happily is not often), and ouabain rather than strophanthin. The soluble forms of drugs such as barbitone, phenobarbitone, fluorescein, and saccharin are now more precisely described as sodium compounds—e.g., sodium barbitone for soluble barbitone. Similarly phemitone is called methylphenobarbitone; and instead of the word pulverata to indicate a powder suitably standardised, as in digitalis pulverata, we read preparata.

Besides the additions made in the seven addenda of the past twelve years, the new volume contains 155 new names. The most impressive series of newcomers is the 57 injections, which bring the total up to 84, compared with a mere half-dozen in the *B.P. 1932*. Here again, however, the majority are familiar remedies now made immediately available in this convenient form. These include such commonplace substances as morphine sulphate, adrenaline tartrate, atropine sulphate, dextrose, neo-arsphenamine, sulpharsphenamine, ouabain, strychnine hydrochloride, sodium phenobarbitone, Ringer's solution, and many others. The modern tendency to produce pure chemical substances for therapeutic use continues to be reflected in the introduction of a large number of new remedies which can be injected if necessary—e.g., digoxin, ergometrine maleate, mepacrine methanosulphate, neostigmine methyl sulphate, pethidine hydrochloride, and suramin. Hormonal preparations are often most suitably dispensed in this form.

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[1] To be published for the General Medical Council by Constable & Co. Ltd., London. Pp. xl — 914.

and there are now official injections of desoxycortone acetate, chorionic (and serum) gonadotrophin, ethisterone, hexœstrol, œstradiol dipropionate, œstradiol monobenzoate, progesterone, and testosterone propionate. Separate injections are now official for vasopressin and oxytocin. Vitamin K as menaphtone and vitamin B_1 as aneurine hydrochloride are, as expected, now available as injections. Notable miscellaneous injections include those of diodone and of iodoxyl which are intended for pyelography. Soluble salts of sulphathiazole and of sulphadiazine are official preparations for parenteral administration. Ethanolamine oleate is used as a sclerosing agent for varicose veins. Vinyl ether has earned approval presumably because experience has shown that in expert hands it is a valuable general anæsthetic. A growing literature shows how difficult it is to combine efficiency with safety in cocaine substitutes. Butyl aminobenzoate and butacaine sulphate (known by the trade names 'Butesin' and 'Butyn') and cinchocaine hydrochloride join amethocaine and orthocaine. Among drugs used as basal anæsthetics are the sodium salts of hexobarbitone and thiopentone, which have long been in common use as 'Evipan' and 'Pentothal.' Picrotoxin, which is firmly established as the drug of choice in barbiturate poisoning, is now official; and phenytoin represents the newer drugs for the treatment of epilepsy. Thiouracil and methylthiouracil are included, and so are papaverine and pethidine, which share an antispasmodic action but differ in other important respects. The original flavine antiseptics did not fulfil expectations, some tending to delay the healing of wounds, but the best of these compounds, proflavine, becomes official as the hemisulphate. Suppositories of old familiar drugs (cocaine, hamamelis, &c.) have returned to the pharmacopœia. The list of vaccines is growing, but the only recent ones that interest the practitioner in Britain are those for the treatment or prevention of acne, whooping-cough, staphylococcal infections, and tuberculosis. The use of tubercle bacilli as an antigen brings the *B.P.* into line with its continental equivalents.

Much wholesome pleasure can be derived from deleting the names of drugs from a pharmacopœia. Thus there will be general satisfaction on finding that upwards of 100 articles and preparations included in previous editions find no place in the *B.P. 1948*; but this is not to say that the Commissioners' reasons for lightening the load will always be appreciated. For example, ammonium carbonate is banished, but ammonium bicarbonate (possessing all the virtues of the carbonate, such as they are) takes its place. Several aromatic waters are excluded, but one (aq. menth. pip.) is replaced by a concentrated water. Few will lament the passing of hoary remedies whose title-deeds to therapeutic potency are lost in antiquity; such are copaiba, buchu, asafœtida, and sandalwood oil—drugs which were once esteemed as urinary antiseptics. Not a few drugs formerly official have been discarded because more active preparations are now preferred; dry extract of liver, powder of vitamin B_1, anti-dysenteric and anti-pneumococcal serum, Easton's syrup, injection of iron, carbromal, and injections of mercury and calomel are all examples of this type. To exclude hexamine on the same grounds seems odd, for even if the sulphonamides have ousted hexamine it is undoubtedly a potent drug in large doses. Other preparations can be sacrificed more readily because they have objectionable side-effects; such are methylsulphonal (though sulphonal remains), cantharadin (including liquor epispasticus), jalap, chrysarobin ointment, and sulphapyridine. Eight infusions and the majority of 17 tinctures are deleted for reasons best known to the pharmacist or on grounds of redundancy.

Many doctors will be surprised and perturbed to find some of their most cherished remedies thrown on the scrap heap. The confections of senna and of sulphur, lobelia, linseed, black wash, and the solution of glyceryl trinitrate no longer claim monographs; but it is comforting to know that many drugs which do not pass muster for the *B.P.* are listed in the *B.P.C.*; and who shall say that none of these will regain its former status in some future edition?

Annotations

REMUNERATION

Laymen reading successive reports from the Spens committees have been known to question the need to improve the financial position of doctors and dentists in relation to other people. They remark that such improvement was not part of the original programme for a public medical service. Doctors, on the other hand, can fairly reply that it was no part of the original programme to lower the standard of living of professional men and women who are doing good and necessary work. The Minister's message on p. 24 suggests that he accepts this principle, and we hope he will be able to give early attention in particular to the situation of the country doctor with a relatively small potential number of patients—a situation which has been well presented in our correspondence columns and was discussed by the representative body of the British Medical Association last week. As was pointed out at the representative meeting, one of the difficulties of payment by capitation fee is that any doctor trying to give really good attention to a small number of patients—and perhaps prevented geographically from augmenting that number—is at a serious monetary disadvantage, and a speaker suggested that the deserving general practitioner in such circumstances should be entitled to some additional emolument for merit, on the lines of the "distinction awards" which the Spens Committee has proposed for specialists.

This suggestion is the more interesting coming at a time when the Spens proposal is itself under fire. Its opponents say that all sorts of personal difficulties will arise if any primarily professional body has to decide on unequal payment of doctors holding similar appointments. Certainly the awkwardness of choice will be increased by the fact that the three awards of £500, £1500, and £2500 differ so widely, and the committee's task might be less formidable if these awards took the form of promotion to one of three ascending scales in which length of service would again operate. Complaints might also be reduced if the regular increments granted to all specialists did not cease quite so abruptly and so early in their career. Such minor modifications, however, do nothing to meet the main objection that a small central committee cannot possibly know much about all the candidates, and that the chances of personal acquaintance might therefore affect its decisions. In answer to this, the suggestion has been put forward that the awards should be made in the regions, by regional appointments committees which would know more about the people concerned. On the other hand, it would be manifestly unfair to allot each region a quota calculated on any rigid scale, and there appear to be strong arguments for leaving the ultimate decision to a central body. We share the opinion of Dr. Cochrane Shanks,[1] who was a member of the Spens Committee, that the principle of making the higher salaries conditional on special merit and ability is a proper and necessary means of encouraging initiative, and we are glad to note that he pictures the national committee making its final selections "only after considering most carefully the recommendations from regional boards, teaching hospitals, Royal Colleges and Corporations, and specialist associations."

Other related questions which burn brightly are the remuneration of doctors directly employed by the Government and local authorities and the remuneration of teachers. The Minister has already shown himself aware of the anomalies that arise from payment of teachers in medical schools at rates far below those obtainable in the public service by men and women of equal or inferior qualifications,[2] and we are glad to hear that the council of the British Medical Association is seeking immediate negotiation to secure that the recommendations of the Spens Committee on the remuneration of specialists are made applicable to full-time teachers and laboratory workers.

ADRENALINE AND INFECTIONS

When a bacterial suspension is inoculated into guineapig skin and muscle, the resulting infection is much more severe if a small quantity of adrenaline is injected at the same time. Evans and colleagues[3] show that the degree of enhancement varies with the species of bacterium used from twice to a hundred-thousand-fold and is most pronounced with *Cl. welchii* and *Cl. septicum*. In their experiments the effect of bacterial toxins was increased only slightly by the addition of adrenaline, and there is reason to think that the enhancement of infections was due to the inhibition of diapedesis of leucocytes and to interference with the mobilisation of the other primary defences of the body; possibly the local ischæmia also prevents the early removal of bacteria from the site of infection. The dose of adrenaline used was insufficient to damage the tissues permanently, and the effect must not be confused with that of such substances as calcium chloride which produce sterile necrosis in the absence of bacterial infection.

Have these findings any application to clinical practice? Cooper[4] reported a case of gas-gangrene in man following the injection of adrenaline and showed experimentally that 62·5 μg. of adrenaline reduced the minimum lethal dose of *Cl. welchii* for a guineapig to 1/10,000 of the dose without adrenaline. The dose used by Evans and colleagues was only 2 μg. Even allowing for differences in body-weight (which are probably of small importance for a drug having a strictly local action) doses many times as great as these are used daily in local anæsthesia, and experience has shown that, given the usual aseptic precautions, local infections after the use of adrenaline are extremely rare. Many surgeons avoid local anæsthesia in the presence of gross sepsis, and with good reason: but it must be remembered that the early local anæsthetics themselves had some slight cytotoxic action. With the improvement of these drugs it might be worth while to investigate the validity of this old tabu.

There are several established practices based on laboratory work whose application to clinical medicine is on unsure ground. For example, is the doctor justified in withholding anti-typhoid inoculation during an epidemic for fear of rendering the patient more susceptible to infection during the negative phase? The answer is that we just do not know, but the objection is raised in every outbreak of enteric infection. Similarly the paper under discussion may lead to the omission of adrenaline from local anæsthetics with which it has been incorporated for very good reasons. The careful experiments of Evans and colleagues do not pretend to reproduce the conditions of clinical practice and they do not seem to call for any change in current procedure. They do suggest however that someone might profitably make a detailed clinical and bacteriological examination of the effects of local anæsthesia in the light of modern knowledge.

IN SEARCH OF BETTER HOSPITALS

Impressed by the need for a re-examination of the purpose and pattern of our hospitals, the Nuffield Provincial Hospitals Trust has joined with the University of Bristol in sponsoring a detailed investigation. The time, as we have suggested,[1] is apt: for years must elapse before new construction makes good existing deficiencies and meets the fresh needs of the new service. The Nuffield research programme concentrates principally on aspects which may be clarified in the 2–3 years that the inquiry will continue. It will be undertaken by a whole-time team, including representatives of a number of interested professions, under the direction of Mr. John Madge, A.R.I.B.A., with Mr. L. Farrer-Brown, secretary of the trust, as coördinating chairman. The investigators are setting themselves to gain a panoramic picture of the hospitals' structure and life, and at points their study will run parallel with the hospital job-analysis which is already proceeding under the ægis of the trust. But beyond that an attempt will be made to look at planning "with fresh unprejudiced eyes," and to review the distribution of work between hospitals and other health agencies—a scrutiny that is long overdue. Not the least of the advantages that may accrue from this programme is the stimulation of long-term research in the same field.

DAMAGE AT ENDOSCOPY

Injury to the pharynx and œsophagus, whether by swallowed foreign bodies, endoscopy, or flying missiles, has always carried a grave risk of death from suppurative mediastinitis and toxæmia. Thoracic suction and the loose bed of cellular tissue in which the mobile pharynx and œsophagus lie give rise to a rapidly developing surgical emphysema and spreading infection which ordinary surgical drainage has little power to arrest. In consequence of this, an ultra-conservative attitude has been adopted in cases of accidental perforations occurring during œsophagoscopy or gastroscopy, treatment being limited to chemotherapy and prohibition of fluids by mouth. Some endoscopists have advised incision of the neck to open up the fascial coverings in the region of the tear and packing of the wound to prevent surgical emphysema and spreading cellulitis, and this is a method which has given excellent results in penetrating wounds of this region in the recent war.[2] Before the days of penicillin, cellulitis and sloughing of the tear in the pharynx or œsophagus either prevented adequate suturing or ruined it through postoperative infection, but, now that penicillin can prevent this, prompt surgery can undoubtedly save patients who have sustained a tear of the œsophagus through endoscopy. Fletcher and Avery Jones[3] pointed out that the common site for tears after œsophagoscopy and gastroscopy is

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1. *Sunday Times*, June 20.
2. See *Lancet*, 1948, i, 374, 911.
3. Evans, D. G., Miles, A. A., Niven, J. S. F. *Brit. J. exp. Path.* 1948, 29, 20.
4. Cooper, E. *Lancet*, 1946, i, 459.

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1. Leading article, *Lancet*, 1948, i, 373.
2. Lichtenstein, M. E. *Surg. Gynec. Obstet.* 1947, 85, 734.
3. Fletcher, C. M., Jones, F. A. *Brit. med. J.* 1945, ii, 421.

and there are now official injections of desoxycortone acetate, chorionic (and serum) gonadotrophin, ethisterone, hexœstrol, œstradiol dipropionate, œstradiol monobenzoate, progesterone, and testosterone propionate. Separate injections are now official for vasopressin and oxytocin. Vitamin K as menaphtone and vitamin B_1 as aneurine hydrochloride are, as expected, now available as injections. Notable miscellaneous injections include those of diodone and of iodoxyl which are intended for pyelography. Soluble salts of sulphathiazole and of sulphadiazine are official preparations for parenteral administration. Ethanolamine oleate is used as a sclerosing agent for varicose veins. Vinyl ether has earned approval presumably because experience has shown that in expert hands it is a valuable general anæsthetic. A growing literature shows how difficult it is to combine efficiency with safety in cocaine substitutes. Butyl aminobenzoate and butacaine sulphate (known by the trade names 'Butesin' and 'Butyn') and cinchocaine hydrochloride join amethocaine and orthocaine. *Among drugs used as basal anæsthetics* are the sodium salts of hexobarbitone and thiopentone, which have long been in common use as 'Evipan' and 'Pentothal.' Picrotoxin, which is firmly established as the drug of choice in barbiturate poisoning, is now official; and phenytoin represents the newer drugs for the treatment of epilepsy. Thiouracil and methylthiouracil are included, and so are papaverine and pethidine, which share an antispasmodic action but differ in other important respects. The original flavine antiseptics did not fulfil expectations, some tending to delay the healing of wounds, but the best of these compounds, proflavine, becomes official as the hemisulphate. Suppositories of old familiar drugs (cocaine, hamamelis, &c.) have returned to the pharmacopœia. The list of vaccines is growing, but the only recent ones that interest the practitioner in Britain are those for the treatment or prevention of acne, whooping-cough, staphylococcal infections, and tuberculosis. The use of tubercle bacilli as an antigen brings the *B.P.* into line with its continental equivalents

Much wholesome pleasure can be derived from deleting the names of drugs from a pharmacopœia. Thus there will be general satisfaction on finding that upwards of 100 articles and preparations included in previous editions find no place in the *B.P. 1948*; but this is not to say that the Commissioners' reasons for lightening the load will always be appreciated. For example, ammonium carbonate is banished, but ammonium bicarbonate (possessing all the virtues of the carbonate, such as they are) takes its place. Several aromatic waters are excluded, but one (aq. menth. pip.) is replaced by a concentrated water. Few will lament the passing of hoary remedies whose title-deeds to therapeutic potency are lost in antiquity; such are copaiba, buchu, asafœtida, and sandalwood oil—drugs which were once esteemed as urinary antiseptics. Not a few drugs formerly official have been discarded because more active preparations are now preferred; dry extract of liver, powder of vitamin B_1, anti-dysenteric and anti-pneumococcal serum, *Easton's* syrup, injection of iron, carbromal, and injections of mercury and calomel are all examples of this type. To exclude hexamine on the same grounds seems odd, for even if the sulphonamides have ousted hexamine it is undoubtedly a potent drug in large doses. Other preparations can be sacrificed more readily because they have objectionable side-effects; such are methylsulphonal (though sulphonal remains), cantharadin (including liquor epispasticus), jalap, chrysarobin ointment, and sulphapyridine. Eight infusions and the majority of 17 tinctures are deleted for reasons best known to the pharmacist or on grounds of redundancy.

Many doctors will be surprised and perturbed to find some of their most cherished remedies thrown on the scrap heap. The confections of senna and of sulphur, lobelia, linseed, black wash, and the solution of glyceryl trinitrate no longer claim monographs; but it is comforting to know that many drugs which do not pass muster for the *B.P.* are listed in the *B.P.C.*; and who shall say that none of these will regain its former status in some future edition?

Annotations

REMUNERATION

LAYMEN reading successive reports from the Spens committees have been known to question the need to improve the financial position of doctors and dentists in relation to other people. They remark that such improvement was not part of the original programme for a public medical service. Doctors, on the other hand, can fairly reply that it was no part of the original programme to lower the standard of living of professional men and women who are doing good and necessary work. The Minister's message on p. 24 suggests that he accepts this principle, and we hope he will be able to give early attention in particular to the situation of the country doctor with a relatively small potential number of patients—a situation which has been well presented in our correspondence columns and was discussed by the representative body of the British Medical Association last week. As was pointed out at the representative meeting, one of the difficulties of payment by capitation fee is that any doctor trying to give really good attention to a small number of patients—and perhaps prevented geographically from augmenting that number—is at a serious monetary disadvantage, and a speaker suggested that the deserving general practitioner in such circumstances should be entitled to some additional emolument for merit, on the lines of the "distinction awards" which the Spens Committee has proposed for specialists.

This suggestion is the more interesting coming at a time when the Spens proposal is itself under fire. Its opponents say that all sorts of personal difficulties will arise if any primarily professional body has to decide on unequal payment of doctors holding similar appointments. Certainly the awkwardness of choice will be increased by the fact that the three awards of £500, £1500, and £2500 differ so widely, and the committee's task might be less formidable if these awards took the form of promotion to one of three ascending scales in which length of service would again operate. Complaints might also be reduced if the regular increments granted to all specialists did not cease quite so abruptly and so early in their career. Such minor modifications, however, do nothing to meet the main objection that a small central committee cannot possibly know much about all the candidates, and that the chances of personal acquaintance might therefore affect its decisions. In answer to this, the suggestion has been put forward that the awards should be made in the regions, by regional appointments to an increase of ½d. on the average dispensing fee, with little dissent. The average dispensing fee has been fixed at 1s., and at the end of three months, when the relative frequency of prescribing mixtures, tablets, ointments, &c., has been determined, the appropriate fee for each class of medicament will be fixed; fees will vary with quantity and dosage. Sterile preparations, eye drops, bougies, suppositories, lozenges, cachets, blisters, and other less common methods of administration will carry special fees. The Government expects about 140 million prescriptions to be dispensed each year. The average fee for all prescriptions under N.H.I. terms is only 6·2*d.* and though the new fee is almost double this figure, many chemists believe that the dispensing department will continue to be subsidised from sales at the counter. In addition chemists will receive a $33^1/_3\%$ profit on the buying price of ingredients, a substantial addition on the higher-priced proprietary preparations but a trifling sum on practically all formulary preparations. For each prescription, irrespective of the medicament required, a container allowance of 2½*d.* will be paid and the chemist must supply a suitable container without charge to the patient. For rota duties after the normal closing hour, which will probably be 6 P.M., a service fee of 7*s.* an hour will be paid, and for service on Sundays and Bank Holidays this will be increased to 12*s.* 6*d.* an hour. For the next three months, until the final allocation of fees is determined, the dispensing fees in the Drug Tariff will be increased by 161·5%, bringing the average fee up to about 1*s.* In Scotland, where the loss of private dispensing will be of serious consequence to chemists, an average fee of 1*s.* 3*d.* has been rejected, though discussions continue. An impartial inquiry on the lines of the Spens Committee has been demanded on behalf of the pharmacists, and they have agreed to accept its findings.

THE ACCELERATED ELECTRON

THE electron has now to conform to man's requirements; gone are the days when it was merely observed as an object of curiosity—it has become a very valuable tool. We know nothing of the electron at rest; only in motion does it betray its presence, and it happens to be the easiest particle in the world to accelerate. The first application of the accelerated electron was in the gas-discharge tube, studies of which led to the discovery of X rays two years before electrons were themselves discovered, so we were using them many years before we knew they existed. Since then "acceleration" has been the keynote of action, and the two ways of changing the state of motion of the electron have been exploited to the full. Since moving electrons behave like an electric current they can be accelerated or retarded by a magnetic field, whereas by virtue of their charge alone they react similarly if brought into an electric field. The electric field was at first the chief agent for producing high-speed electrons, and the method was to apply a steady electric field of the maximum voltage needed to realise a certain speed; the more ingenious modern methods accelerate the electrons in jumps magnetically, the interval between jumps being about a hundredth of a second. This magnetic pushing is the principle of the synchrotron, which gives the electrons a speed equal to that produced by 30 million volts; yet, because the magnetic impulses are synchronised with the arrival of the electrons at one particular region of the circuit, the operating voltage has nowhere to be greater than in an ordinary wireless circuit.

High-speed electrons can be used as such or can be made to hit a target, so producing very penetrating X rays. Technically the radiotherapist wants the most penetrating radiation possible, for with this he can more easily attain the desired depth and surface intensities with minimal damage to the skin and normal structures. But there is one unresolved consideration which may make him hesitate before using 300 *million volt rays*, for it is an experimental finding that such penetrating rays can render the tissues they traverse radioactive; it is a feeble radioactivity but it may well act as a danger sign. The acceleration of electrons is now being applied to fluoroscopy. If the electrons are accelerated just before they reach the fluorescent screen, their increased energy will excite the crystal matrix to greater luminosity. This is done by allowing the X rays that have passed through the body to fall on a screen which readily emits electrons, and then to introduce an electric field between this electron surface and the fluorescent screen. The originator of this idea is Edward Chamberlain, of Philadelphia, and it has been successfully worked out by J. R. Coltman, physicist to the Westinghouse research laboratory. Any device which reduces the exposure of the radiologist to X rays will be sure of a welcome.

D'ARCY WENTWORTH THOMPSON

Sir D'Arcy Thompson, who died on June 21, was appointed professor of biology in University College, Dundee, in 1884, at the age of 24; and in 1948, at the age of 88, he still graced the chair of natural history in St. Andrews University. During those long years of teaching he had befriended and inspired succeeding and growing classes of young men and women at the most impressionable stage of their training. His earliest class—for there was only one student—recalls that skeleton-mounting and preparation of specimens filled most of the course, but for one hour each day the class assembled and was entranced by a formal lecture, beginning: "Sir,——." The following passage, taken from Thompson's review of some of Ronald Ross's poetry, will serve to illustrate the power over words and thoughts that afterwards delighted so many generations of students:

> "Only a few days ago, lecturing to my class of some eighty young men and women newly entered a week before upon their medical course, I tried to tell them what Protozoa meant to our fathers, and what (thanks to Pasteur and Grassi and Patrick Manson and David Bruce and Ronald Ross and many another) they have come to mean to us. In my student-days an Amœba, a bell or slipper animalcule, a little ooze from the Atlantic, a few radiolarian or foraminiferal shells, told us all we knew of Protozoa. Today a new world is opened, in which we hear of tiny things with strange life histories, of momentous chains of cause and consequence wherein rat and louse and gadfly and mosquito play their insidious part, bringing fever to the swamp and murrain to the plain: we are told at last of mysterious maladies explained; of epidemics held at bay, of territories and peoples emancipated from disease. And then as an example of the spirit of the scientific physician, of aims conceived, of dreams come true, I ventured to read them a couple of Ronald Ross's early verses. . . . My students listened and went quietly away, and I could see by their faces that they had heard the words of the poet and physician, as though he were speaking to them."

A poet and scientist was indeed speaking, and many heard him.

AN OCTOGENARIAN *PRACTITIONER*

WITH its July issue the *Practitioner*, founded in 1868 by Dr. F. E. Anstie, of the Westminster Hospital, celebrates its eightieth birthday. Its first volume is reviewed by Dr. W. R. Bett, who also gives a brief account of its contemporaries. An article contrasting 1868 and 1948 as regards world affairs, social conditions, and medicine is contributed by Sir Heneage Ogilvie, the present editor.

BY June 26 16,537 doctors in England and Wales and 1976 in Scotland had joined the National Health Service. By the same date 7,400,000 patients not previously covered by health insurance had been enrolled.

the posterior wall of the lower pharynx and upper œsophagus, and Hermon Taylor[4] indicated how this resulted from pressure between the instrument and the prominent convexity of the extended cervical spine, rather than from any anatomical weakness of pharyngeal wall. In his article last week (p. 985) Mr. J. C. Goligher takes the view that the œsophagopharyngeal wall should always be explored in patients developing surgical emphysema in the neck after endoscopy, provided the endoscopist can exclude damage, for example by biopsy or dilatation, to the lesion for which the examination was undertaken. Most gastroscopists and œsophagoscopists would perhaps advocate a more cautious approach, since clinicians with experience in this field will recall many cases with excessive soreness in the throat and perhaps a degree of swelling in the neck which they have felt must have been due to a small laceration, and which have readily recovered with chemotherapy and the withholding of fluids. However, if such a case shows no sign of limitation, Goligher's plan of prompt operation is the correct one, with the object of suturing the tear as he describes; and if this is impossible, the wound should be packed and drained.

DISTRIBUTION AND SAFETY OF MILK

THE Williams Committee on milk-distribution, which reported last month, recommended the setting up of an independent commission to take over the responsibility of the Ministry of Food for the marketing of milk. It suggested that the commission should operate experimentally as processor and retailer, with monopoly powers, in one or more of the new satellite towns. Such a commission would take over some of the functions of the Milk Marketing Board, which has done much to stabilise prices for the farmer since the depression of the 1930's. It is therefore not surprising that there should be strong opposition from farmers to these proposals.[5] The committee believes that its scheme would be preferable to the alternative of public ownership both now and in the more distant future, but two of its members consider that public ownership and operation would ultimately secure greater economies.

The committee urged the application of compulsory heat-treatment to all milk except in remote areas. For the present it would exempt T.T. milk, "which largely protects the consumer from at least the most serious of the milk-borne diseases," but it would prohibit from the outset the retail sale of accredited milk in any area scheduled for heat-treatment. The Government have now decided to introduce a Bill to prevent milk from being sold retail unless it has been heat-treated or is sold as T.T. milk or accredited milk from a single herd. There is no scientific justification for the exclusion of accredited milk from heat-treatment, even if it comes from one herd. Accredited milk is usually cleaner than non-accredited, but it has no greater freedom from disease. On the average, milk from any one herd will contain tubercle bacilli less often than bulked milk, but when it does the infection will usually be much more severe. The Government's reason for not accepting this recommendation of the Williams Committee appears to be the practical one that facilities for heat-treatment are insufficient. The Milk Marketing Board will be establishing an experimental creamery in Durham which will offer producer-retailers facilities for heat-treatment which they could not afford for themselves individually. If the scheme is successful these facilities will presumably be extended to other areas as rapidly as possible.

It is of the utmost importance to dairy farmers and milk consumers that better progress should be made with the attested herds scheme, so that within the next few years groups of parishes and then whole counties can be cleared of bovine tuberculosis. A recent summary[6] of the progress already made shows that there are now over a million cattle in attested herds. As was emphasised during the Parliamentary debates on the Veterinary Surgeons' Bill, the control of tuberculosis and other diseases of cattle contributes directly to public health and also increases the efficiency of milk production.

PHARMACY IN THE SERVICE

ALL dispensing in the National Health Service, except the relatively small volume done by doctors in rural areas, will be in the hands of retail pharmacists and is likely to remain there at least until health centres are firmly and widely established. No extensive examination of the position of pharmacy has been attempted since the inquiry instigated by the Pharmaceutical Society over a decade ago, but a concise picture of present-day conditions emerges from the report[7] of a working party set up by the Minister of Health and the Secretary of State for Scotland to study the dispensing practices in their respective domains. The working party estimates that in England and Wales 80% of practitioners now undertake dispensing for their private patients, whereas in Scotland the figure is only 10%. Hence the English pharmacist must expect a large increase in his "non-insurance" dispensing and this will usually involve enlarging the dispensary. Shortage of staff may prove an additional difficulty, but most qualified dispensers are not fully employed on this work; the average usual output per dispenser was found to be 6390 prescriptions in England, 4040 in Wales, and 5120 in Scotland, whereas an expert dispenser, working in a properly equipped dispensary, might be expected to deal with 9000 prescriptions a year, or about 4 per working hour. This potential output could be increased in areas where prescribing follows a common form but in a London West End pharmacy, following the best traditions of the craft, 3 prescriptions an hour is perhaps the maximum capacity of the pharmacist. Man-power shortage can be reduced by the use of non-dispensers for many ancillary tasks in the pharmacy.

Prescribing habits differ widely in the two countries; in England over 83% of mixtures in insurance practice are prescribed from formularies, either the National or the *B.P.C.*, and 37·8% in private practice, against only 3·5% and 1·3% respectively in Scotland. In Scotland, however, about 19% of mixtures are prepared from doctors own formulæ, a feature which is absent from English and Welsh prescribing; ointments prescribed show a similar trend. The shelves of English pharmacies contain an average of 12 stock mixtures, all of which are prepared on the premises and used within a few days; these time-saving devices are not used in Scotland or in Wales. Concentrated stock mixtures are little used throughout Great Britain. Scottish pharmacists look on each prescription as a thing apart, ordered for the needs of a particular patient, and maintain that it should be compounded from scratch; the English pharmacist contends that the small errors which are inseparable from all processes of measurement are reduced to a minimum in the larger quantities involved in stock preparations.

The terms offered to English and Welsh pharmacists for participation in the new service have been accepted with only a token resistance movement in a few areas. A conference of pharmaceutical committees and branches of the National Pharmaceutical Union, which represents proprietor chemists, first rejected the terms offered, but then accepted an amended offer, regarded as equal addition give an atmosphere of individuality to each hospital; others require personal service, and it would be an unhappy day when that were cast out from our midst. A house committee will not manage its hospital, but it will have a valuable function in advising the management committee and in meeting these indefinable needs of the hospital patient.

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[4] Taylor, H. *Ibid*, p. 543.

[5] *Farmers Weekly*, 1948, 28, 27.

[6] *Vet. Rec.* 1948, 60, 302.

[7] Report of the Working Party on Differences in Dispensing Practice between England and Wales and Scotland. H.M. Stationery Office. 1948. Pp. 40. 1s.

As chairman of a hospital management committee the first thing I can see is that groups of hospitals which used to go their own way will now be united under a single managing body. This offers an immediate opportunity for the staff, both senior and junior, to get together and inquire what service they can render, not to one unit alone but to the group. It also creates for the first time a real chance for the visiting consultant to become an active member of the staff of the hospital in which he used to pause for an hour or two on his great journey.

THE EXECUTIVE COUNCIL

First to be established among the many new bodies needed to administer the National Health Service Act, the executive councils suffered at the start because of this priority. They were set up when medical opinion was running strongly against the Act, when every move of the Minister was regarded with suspicion, and when any coöperation offered was likely to be grudging and conditional. Moreover, they had to try to weld into an executive whole elements drawn from five distinct (and potentially antagonistic) sources. Three of the groups were professional, severally representing the doctors, the dentists, and the pharmacists, while the rest were governmental—nominees of the local health authority and of the Minister. The Minister's nominees were mostly survivors of the old insurance committees, often having strong associations with approved societies. It can hardly be said that this pattern gave promise of easy coöperation. Nevertheless in most areas things have worked out better than might have been expected. The local medical committees chose doctors of experience to represent them, and the expert professional advice they have been able to afford on a host of different complicated schemes coming before the council for ratification has done much to promote respect and understanding for the doctor's point of view.

The executive councils have found it necessary to set up financial and other subcommittees. Doctors have been afforded a full share of responsibility in these subcommittees, and have often been chosen as chairmen or deputy chairmen. Particularly in the larger local-authority areas, the need for liaison with such bodies as the hospital management committees—of which there may be twenty or more within the boundaries of the larger counties—has thrown a considerable extra strain upon the already overtaxed time of council members. The doctors have had to accept part of this responsibility, each taking his place on the appropriate local hospital committee.

The executive machine must at present run in top gear, if it is to be able to cope with the influx of applications and settle the problems of patients and doctors proposing to participate in the service. Soon this initial work should quieten, and more time and thought can then be spared to face the tasks the future holds. Predominant among these must be the establishment of health centres. By the time this appears on the agenda the doctors in most counties will probably have settled into a relationship with their colleagues on the council that will give them considerable authority in discussion.

The doctors are now numerically stronger than in the old insurance committees, and can be drawn from a wider selection of areas. For the first time they meet and confer with the councillors, who in another place are responsible to the people for health provision. The design is one which can, and eventually will, provide great and growing opportunity for professional guidance of, and influence on, the developing pattern of the new service.

THE TEACHING HOSPITAL

The Act gives the teaching hospitals opportunities which, if used wisely and imaginatively, augur well for the future of medicine in general, and of medical education in particular. All hospitals will be less susceptible to those financial anxieties which changing economic circumstances bring in their train; equipment and facilities will be more closely related to demonstrable needs and less dependent on the whims of the generous. But it is especially in the solution of two closely related problems for the teaching hospitals that the new order opens the way.

Firstly, in adjusting the internal pattern of its services so that the demands of undergraduate teaching may best be met. In the past few decades the increasing complexity of diagnosis and treatment has been reflected in an increasing compartmentalism; the teaching hospital has too often become a collection of highly specialised units, and undergraduate training has correspondingly suffered. The future offers opportunities for experiment: for example, in the design of the undergraduate teaching hospital; the distribution of beds; the provision of "admission" wards through which most patients will pass before they are directed to the medical, surgical, or specialist services; the association of model health centres with the work of the hospital; and a host of other issues.

Secondly, teaching hospitals have hitherto remained too often isolated both from each other and from non-teaching hospitals. The inadequate use, for teaching, of the staff and facilities in non-teaching hospitals has been rightly criticised. Clearly all suitable resources in both groups of hospitals should be tapped for both undergraduate and postgraduate teaching. To this end the term "non-teaching" hospital should be abolished, and two desiderata promoted:

(1) There must be a large measure of common staffing between both groups of hospitals. Special units will be placed where they are best suited, and the needs of the undergraduate will not be sacrificed to those of the member of a teaching hospital staff who is developing such a unit.

(2) There must be set up non-statutory committees, representing three interests—the university medical school, the regional board, and the board of governors—whose prime concerns will be how to ensure this common staffing and how and where can best be provided the clinical requirements of the medical school for its undergraduates and postgraduates.

The harmonious working of such a committee, and the personal contacts it would permit, would play a most useful part in breaking down any barriers which might arise between regional and teaching hospitals. Nothing will militate more against the success of the projected hospital service than its inheritance of antagonisms analogous to those which so often existed in the past between teaching and non-teaching hospitals, and between voluntary and municipal hospitals.

In a unified hospital system, the regional and teaching hospitals have complementary rôles: both will take part in teaching; both will, it is hoped, provide the highest standards of service. But each will so model itself that it can best fulfil its special purpose for the general good.

THE REGIONAL BOARD

Most regional boards have now completed their first task—the grouping of hospitals and the selection of committees of management ready to take over on the appointed day. Much more "domestic" spade-work lies before them. Work of this type is all-important if the hospitals are to be efficiently and economically administered. For the most part such problems are the

NATIONAL HEALTH SERVICE

A Message to the Medical Profession from the Minister of Health

ON July 5 we start, together, the new National Health Service. It has not had an altogether trouble-free gestation! There have been understandable anxieties, inevitable in so great and novel an undertaking. Nor will there be overnight any miraculous removal of our more serious shortages of nurses and others and of modern replanned buildings and equipment. But the sooner we start, the sooner we can try together to see to these things and to secure the improvements we all want.

On July 5 there is no reason why the whole of the doctor-patient relationship should not be freed from what most of us feel should be irrelevant to it, the money factor, the collection of fees or thinking how to pay fees—an aspect of practice already distasteful to many practitioners. Yet it has been vital, if this is to be the new situation, to see that it did not carry with it either any discouragement of professional and scientific freedom or any unfair worsening of a doctor's material livelihood. I sincerely hope and believe we have secured these things. If we have not, we can easily put that right.

The picture I have always visualised is one, not of "panel doctoring" for the less well-off, not of anything charitable or demeaning, but rather of a nation deciding to make health-care easier and more effective by pooling its resources—each sharing the cost as he can through regular taxation and otherwise while he is well, and each able to use the resulting resources if and when he is ill. There is nothing of the social group or class in this; and I know you will be with me in seeing that there does not unintentionally grow up any kind of differentiation between those who use the new arrangements and those who, for any reason of their own, do not. Let this be a truly national effort. And I, for my part, can assure you that I shall want vigilantly to watch that your own intellectual and scientific freedom is never at risk of impairment by the background administrative framework, which has to be there for organising purposes, but in which your own active participation is already secure.

In this comprehensive scheme—quite the most ambitious adventure in the care of national health that any country has seen—it will inevitably be you, and the other professions with you, on whom everything depends. My job is to give you all the facilities, resources, apparatus and help I can, and then to leave you alone as professional men and women to use your skill and judgment without hindrance. Let us try to develop that partnership from now on.

It remains only to wish you all good luck, relief—as experience of the scheme grows—from your lingering anxieties, and a sense of real professional opportunity. I wish you them all, most cordially.

ANEURIN BEVAN.

The Opportunities

In developing the new service members of the medical profession are already playing a large part. We have asked six of them to say something about the aims of the boards or committees to which they belong.

MANAGEMENT COMMITTEE

Some people still think that the fiery cross will go round the professional clans on the fatal night of July 4–5. They are mistaken. Nurse Robertson will drink her cup of tea, and Dr. Hendry will take his white coat down from the peg as usual. Mrs. Richard Brown will lie placidly in bed, at Roxton Cottage Hospital, on Monday as she did on Sunday; and her new baby will be just as wonderful.

When the hospital management committee meets, the first thing that its members have to learn is to extend their loyalty from the unit to the group, in the firm belief that the group will reward their faith by offering wider opportunities for service to the sick. The second point to remember is that they do not represent any one hospital or any single interest. Most of them are local folk, sensitive to the traditions and prejudices of their own place. That is as it should be; but it must not allow them to turn the management committee into just one more link in the *long chain of administration*. The job of the committee is not to delegate, but to manage the hospitals of its group. If it fails to bring about this coördination, it fails altogether.

A hospital group is not a machine; *it is a form of human society woven together by the threads of human relationships.* In the balance it is the persons that count, and the cooperation of medical, nursing, and technical staff in the work of the group is far more important than mere administrative tidiness. The composition of the hospital group under one management varies greatly: some groups contain several general hospitals with full-time directors and professional staff; others have a special hospital with national as well as regional obligations; and others again support one big parent hospital surrounded by a family of little ones. It is of great importance that the staff should get together quickly and study how they can best work as a team, so as to render the most effective service to the group as a whole. There will be one main committee to balance the various needs and serve them *in a rational way, and there will be one staff* to help where help is most required. This excellent X-ray apparatus at Loxton will serve three small hospitals comfortably and in this way all of them will have the benefit of Dr. Martin's wide experience in radiology. The three radiographers also will be able to arrange their duties so as to get regular time off, without interrupting the service. *That dangerous little set* at Poxton Cottage Hospital can now be dismantled, and the room it clutters up can make a useful addition to the outpatient department. We may even ask the regional hospital board to pension off the poor old isolation hospital at Moxton and transfer our patients to the splendid modern wards at Foxton. The first step *is to bring together and to simplify.*

There are pitfalls to be avoided. The people of any district have a pride and delight in their own hospital. It is right that they should continue to give support, both personal and financial, to the institution which they have built up, perhaps over many years. There ought to be no conflict between the unit and the group. All places for the care of the sick have needs that budgets cannot satisfy; some of these needs cost money to fulfil—the delicate amenities such as flowers and special decorations that mean so much to the sick, and in

BRITISH MEDICAL ASSOCIATION

In 1914 the British Medical Association met at Aberdeen; and its first full meeting after the first war was held, in 1920, at Cambridge. In 1939 the meeting was again at Aberdeen; and now the second round has been completed by the first full meeting since 1939 which opened last week at Cambridge.

PRESIDENT'S ADDRESS

In his presidential address, on the Changing Face of Medicine, Sir LIONEL WHITBY measured the past against the future. He was able to show that State control is no new venture, for about 1948 B.C. King Hammurabi, of Babylon, issued an edict whereby medical practice was governed by a code which was published in every market-place. Egyptian medicine was governed by the code of the Ebers Papyrus; whilst the books of Leviticus and Deuteronomy described a fine example of public-health regulations under central control. Nor was the "closed shop" principle new. For many centuries the physicians in this country clung to their monopoly, stubbornly refusing the claim of the barber-surgeons to prescribe internal remedies.

In more recent times State intervention had been hastened by three wars in the first half of this century. The examination of recruits for the Boer War revealed appalling unfitness, which led to the establishment, in 1907, of a school medical service, and subsequently of maternity and child-welfare services and the National Health Insurance scheme. The Ministry of Health was born of the turmoil of the 1914–18 war; while in the late war the Emergency Medical Service afforded experience for the foundation of the National Health Service.

It had to be admitted that the State's growing participation in medicine was not without advantages. Modern team-work provided, organised, and financed by the State could do much to exploit and perfect a fundamental discovery: witness the speed with which money and coördinated work brought penicillin into the realm of everyday therapeutics. But nationalisation must inevitably restrict individualism; and

> "let us hope that there will always be elbow-room for a man to work out his own ideas, to be outspoken in criticism and in debate, and to be free from unnecessary restrictions, regulations, and regimentation. Let us hope that men may still be inspired to undertake work for the love of it."

Representative Meeting

The representative body assembled on June 25, under the chairmanship of Dr. J. B. MILLER. It was agreed that next year's meeting should be held at Harrogate, under the presidency of Dr. C. W. Curtis Bain. Dr. Peter Macdonald and Prof. R. M. F. Picken were elected vice-presidents in appreciation of their exceptional services to the association.

WORLD MEDICAL ASSOCIATION

Dr. H. A. PRIDHAM (Dorset) reported that the World Medical Association now had offices in New York. A general assembly to be held at Geneva in September would consider a wide range of subjects, including medical ethics, social security, postgraduate training, resettlement of refugee doctors, secret remedies, and exchange of visits between doctors in different lands.

NO WITCH HUNT

Dr. H. GUY DAIN, chairman of the council, said that since the representatives' last meeting the Negotiating Committee had set up subcommittees concerned with general practice, specialist practice, compensation, and other problems.

Dr. A. C. E. BREACH (Bromley) moved that, in view of the doubts and criticisms among some doctors, the council should be asked to set up a committee to investigate the conduct of the profession's case this year. The purposes, he suggested, should be to learn what really happened, and to get information which would be useful in the future. Dr. J. B. W. ROWE (Harrow) agreed that many doctors were dissatisfied with the recent conduct of affairs, and he thought that such a committee's report might be useful in the future; it should not be forgotten that the Socialist party still adhered to the idea of a whole-time salaried service. Dr. DAIN retorted that the motion was founded on suspicion; the implication was that he and the council had not disclosed information, and this he refuted absolutely. "There is nothing which the committee can disclose which is not already fully known to you." Moreover, representatives had taken responsibility for each step. The real purpose of the resolution was to discover what differences existed among representatives; but they had agreed to cooperate in the new service, and it was for them to keep the association firmly on its feet. The proposed investigation would have a harmful effect on public and medical opinion and on the standing of the association. Dr. E. A. GREGG (St. Pancras) urged that there should be no heresy hunt. Only bad feeling, resentment, and unpleasantness could come from the setting up of this committee. Mr. A. DICKSON WRIGHT (Marylebone) was puzzled to know why the chairman of council and Dr. Gregg were so vociferously opposed to the establishment of the committee. There was, he thought, mystification among the profession and the public; and even as a member of the council he had been surprised at the sudden collapse of opposition. At the centre it was said that the rot had started at the periphery; but at the periphery it was asserted that it had begun at the centre. Dr. C. F. MAYNE (Plymouth) pointed out that the council had been given a free hand; and Dr. S. WAND (Birmingham) pleaded for unity which, he said, implied standing by the majority vote. Dr. Breach's resolution was rejected.

REMUNERATION

Dr. P. J. GIBBONS (Liverpool) called for negotiation of terms of service for all medical hospital staffs not covered by the Spens report. This was accepted after Dr. DAIN had explained that the council intended to examine the remuneration of all doctors in the light of the two Spens reports; the intention was to see how the remuneration of all—including those in the Public Health Service, the Armed Forces, and the Colonial Service—could be related to the recommendations in these reports.

Dr. R. G. ANDERSON (Gloucestershire) demanded adequate remuneration of general practitioners as a vital factor in maintaining and improving the quality of medical practice. Dr. O. C. CARTER (Bournemouth) said that the Spens Committee on the remuneration of practitioners, of which he had been a member, had taken 2000 as the desirable maximum number of patients; and as soon as more doctors were available, remuneration should be determined according to a lower maximum than the present 4000. It was important, moreover, to see that special awards were correctly allocated to outstanding practitioners; the fact that a doctor had 4000 patients on his books did not necessarily mean that he was outstanding. Finally, it was necessary to make natural concern of the lay members of boards. To the medical members, however, more fascinating problems loom ahead, and it is clear that the Act has conferred upon us as a profession great responsibilities for the exercise of imagination and leadership. These responsibilities are ours alone, and we must not fail to rise to the occasion. Regionalisation, in essence, is the diffusion throughout a region of a complete specialist service based on the hospitals, and the integration of all fields of specialist practice in a coherent whole. We are primarily concerned with the standards of the science and practice of medicine. Such regionalisation cannot be achieved by any so-called bureaucratic plan involving regimentation and direction of the members of a specialist corps within a region; nor, as I see it, does the Act suggest or even encourage such notions. One master there must be in the final analysis—the Treasury—which implements the ideas of the nation on the amount to be spent on the hospital services. To this disciplinary check we must all bow. But regional boards, boards of governors of teaching hospitals, and committees of management all contain large quotas of medical members; and advisory medical committees, both in hospitals and outside hospitals, will soon be set up. As a profession we are in a more powerful position than ever before. If we grasp the opportunities presented to us the hospital services of the future will bear the imprint of the ideas and standards of our free and learned profession. July 5 in the hospital world in this country is not the Loss of Independence Day, but, as President Woodrow Wilson long ago said of July 4, "This is Interdependence Day."

THE LOCAL MEDICAL COMMITTEE

So that the transition from National Health Insurance to the National Health Service should be smooth, the Minister of Health said some months ago that he would recognise the existing local medical and panel committees as "local medical committees" for the purposes of the new Act. As election to these committees was suspended during the war, many have been preparing themselves for their new duties by fresh elections and sometimes by revision of their constitution.

Many of the duties so far undertaken are not new; they had their parallel under National Health Insurance. It was no novelty to older members of the committee to be asked to scrutinise, amend, and approve schemes for allocation, distribution, and mileage; nor did they find it hard to accept membership of such familiar bodies as the medical service committee (dealing with complaints against doctors) and the allocation committee (dealing with patients unable themselves to secure acceptance on any doctor's list), or even of the executive council itself. For though the council offers the local medical committee a larger part to play, it remains the old insurance committee writ large. What are new are the opportunities now being provided for linking the activities of the local medical committees with those of bodies such as the statutory health committees of the local health authority, the hospital management committees, and the regional committees for consultants and specialists. In some local medical committees, also, reciprocal cooption of representatives from such fields as obstetrics, ophthalmology, and preventive medicine is being discussed. Through these new links the local medical committees are finding new means of integrating the different parts of the growing service, and particularly of ensuring that at no level shall the needs of the general practitioner be unknown, nor his advice unsought.

If the load is to be spread and the work well done, such diverse calls as these demand that in many areas there should be larger committees, meeting more frequently than has usually been necessary in the past. On the whole the extra work is being readily undertaken. In my own committee, meetings are well attended: each new scheme or fresh regulation is critically examined; the many nominees required for service with other bodies are forthcoming in more than adequate number; and altogether there is good reason to hope that, even though the infant service does not escape all teething troubles, these inevitable maladies will at least be detected and corrected without either undue delay or disaster.

THE MEDICAL OFFICER OF HEALTH

The great debate is over. Some questionings and some doubts remain, but the fundamental question is answered. It has been a necessary phase, which has secured to the profession its essential freedoms. Now the tumult and the shouting dies and the hum of preparation gains in intensity. What are the opportunities as they present themselves to the eyes of a medical officer of health? His gaze may at the moment be somewhat myopic—no section of the profession indeed has been more drastically reoriented—and focused on his departing glories rather than on the future; but his work, one hundred years of struggle towards the greatest good of the greatest number, both needs and develops the philosophic mind, and he has the consolation of seeing the preventive idea now dominating the whole of British medicine. He has the still greater consolation of an important place in one of the three great branches of the new service. Here he can be of real value in fostering the team-work which should be the keynote.

Coöperation, not competition. Not at any rate competition for the most patients and the biggest income, but rather for the best standard of service, whether in consulting-room, health centre, or hospital. And coöperation in placing knowledge and technical resources at the disposal of any patient who needs them. This is the greatest of the many opportunities the Act presents. Nothing less must be the goal of those who join. Those who stay out will miss something. They may be less pressed; the amount of time they can give to individual patients may be greater; but the stage on which they perform will be smaller. Attending to the medical needs of 40 million people is a big and worth-while job. It will mean pressure on those providing the service, it will certainly involve frustrations and vexations, but it will give satisfaction—not least the satisfaction of working in teams.

The profession can mould the service. On every piece of administrative machinery it is well represented and on some it is dominant. Committee work can be boring, but it is indispensable and the profession's opportunity is as great as its responsibility. Traditions must be made, and policy guided by the accumulated skill and wisdom of the profession. Its committee men must do a good job.

The profession must also examine its rôle in health education. Much of what now passes under that name only produces disease consciousness. That in turn means fear. It is surprising how large a part fears play in modern life. We have it that the right kind is the beginning of wisdom, and the doctor can perhaps discourage some of the others. The effort, one imagines, will have to concentrate more on the individual than on the mass, but there will be scope for it in the new service. Even within the profession itself there are some of these fears and bogies that we might well start to exorcise.

The nation has recently lived triumphantly through its finest hour. We are all a bit tired and the road to the new service will be uphill at the beginning; but the vista at the top will match the vision at the foot. Pioneering has never been easy, but the profession now has its chance. Grumbling in traditional style, it is also getting ready to get on with the job. The shades of Simon, Budd, Farr, Hunter, Lister, Osler, Macewen, Robert Jones, Dawson, and others of the elect must be watching with interest. And so must that of Chadwick.

the profession there was a tremendous body of opinion against forming a union. Dr. DORIS ODLUM (Bournemouth) held that among the necessary modifications was redistribution of geographical representation to conform with the new regions.

Dr. J. N. P. DAVIES (Uganda) intervened to tell of his experience of a complete service under government control. If, he said, representatives knew what had gone on in the Colonial Empire for 25 years, they would see the need for a union. Governments were now conditioned to collective bargaining, and this had to be backed up from time to time by strong action. In a government service conditions were never permanent; they were liable to be changed without negotiation.

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Dr. DAIN agreed that a special committee should consider modifications in the constitution, and that a representative meeting should be called as soon as the committee's investigation was completed. Satisfied with this promise, the meeting passed to the next business.

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Mr. N. ROSS SMITH (Bournemouth) moved that the central committee should be autonomous. Specialists, he added, feared that they might be outvoted in the association; and it was essential to allay this fear since otherwise they might form an outside body, which would perpetuate the division among themselves and between themselves and other doctors. Dr. DAIN accepted the suggestion that the central committee should have the same status and independence as the Insurance Acts Committee. Mr. HUGH CARSON (Birmingham) reported that in his area the sentiment of specialists was that the committee should be separate from the association; and he believed that this feeling prevailed elsewhere. The Bournemouth resolution was carried.

The meeting also agreed that the central committee should elect its own chairman who should thus become a member of the council.

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Dr. DAIN said that by this plan consultants and specialists would be assured of an autonomous machine, free from control by any central caucus. The plan would be put into immediate operation.

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Dr. R. FORBES, chairman of the Coroners' Acts committee, secured approval for recommendations made by a special committee set up in 1946 to report on the medical aspects of these Acts. The following are among the recommendations:

> (1) (*a*) That the most suitable persons for appointment to coronerships are those with dual qualifications in medicine and law; (*b*) that coroners' jurisdictions should be merged in natural areas large enough to warrant the appointment of suitably qualified coroners.

special provision for doctors in areas where the number of chronic sick was abnormally high.

Dr. W. Woolley (Bristol) argued that, for future protection, representatives should make sure that the Minister of Health fulfilled his promise to implement the Spens report. Dr. Wand agreed that the "spread" had not been obtained; but attainment of it was difficult with payment by capitation fees, and it might be wise to leave this question in abeyance for a short time. He hoped that representatives would give their attention to the betterment factor, which seemed insufficient to him. Dr. R. B. McColl (Denbigh and Flint) reported that in his part of the country some doctors would have to be content with lists of 1200–1500; there, he said, the possibility of remuneration by a sliding scale had been mooted.

Dr. Dain reminded representatives that the Minister had given an assurance that as soon as the service started they would be free to raise the question of the betterment factor through the appropriate Whitley council. Except that the full range was not covered, the Minister's offer had assured full implementation of the Spens report. The average list would be of about 2000; only the very able and those geographically well situated would be able to take 4000. He argued that doctors in rural areas with considerably less than 4000 patients would fare well enough with remuneration from the capitation pool and the special inducements fund, and with ordinary and special mileage allowances; and soon the betterment factor might be increased. The idea of a sliding scale, by which those with most patients got least reward, was pernicious; and he preferred that special protection should be given to the rural practitioner. The Gloucestershire motion was carried.

Dr. J. S. Ross (East Herts), moving that the question of remuneration of practitioners on the staffs of cottage hospitals should be brought to the notice of the Minister, said that there was a good case for their proper remuneration. This resolution also was carried.

MILEAGE

Dr. R. G. Gemmell (Dumfries and Galloway) won support for a resolution that the Minister of Health should be pressed to grant an adequate mileage fee for rural practitioners. After Dr. Dain had described the proposed mileage arrangements, which he thought adequate, Dr. O. G. Barber (Mid Essex) suggested that capitation fees should be determined in units up to a maximum of 4000. In towns each patient would count as 1 unit; in some rural areas each would count as $1^1/_2$ units, while in others each might count as 2 units.

MATERNITY MEDICAL SERVICE

Dr. W. D. Steel (Worcester and Bromsgrove) proposed the abolition of local obstetric committees. How, he asked, was efficiency to be estimated by a committee consisting of 1 obstetrician, 1 medical officer of health, and 2 general practitioners? Dr. D. L. S. Johnston (Halifax) thought that the best solution would be for new entrants to the service to undertake three months' postgraduate training in midwifery, to qualify them to take part in the midwifery service. In his area no-one was willing to sit in judgment on his colleagues; owing to the difficulty of adjudication established practitioners should be allowed to continue midwifery. Dr. Dain pointed out that originally there was no place for the practitioner in the new midwifery service, except when he was called in by the midwife. Now, however, the doctor who was doing sufficient midwifery and wanted still to do it could be entered on the list; and time would show whether he continued to do enough. The difference in fees between approved and non-approved practitioners was determined by difference in the extent of service: the five-guinea fee was for attendance at the confinement, while the seven-guinea fee was for antenatal and postnatal attention in addition to, sometimes, attendance at the confinement. The Worcester motion was rejected.

PHARMACEUTICAL SERVICES

Dr. Ross (East Herts) gained support for a resolution that patients who obtained medical service outside the scheme should not have to forgo the benefits of the pharmaceutical service. Dr. Dain said that the Minister had refused to concede this point, arguing that he must retain some control over the ordering of drugs. It was hoped that such drugs as insulin might be obtained through hospitals by private patients. The whole question was still under review.

MEDICAL REPRESENTATION ON COMMITTEES

Dr. Barber proposed that legislation should be introduced so that the appointment of doctors to statutory bodies should be by democratic election by the profession and not by the Minister's nomination. Dr. Dain pointed out that this right had already been gained in respect of executive councils. As regards other bodies, the Minister was bound to consult, but he consulted many organisations in addition to the B.M.A. Dr. Dain thought that the association might publish the names of its chosen nominees; Dr. Barber's resolution was carried.

VACCINATION

Dr. J. W. McCarthy (Hendon) called for the restoration of compulsory vaccination. What he feared most was encephalitis among those vaccinated for the first time during a smallpox outbreak. The meeting preferred, however, a more modest resolution by Mr. A. Lawrence Abel (Marylebone), which demanded constant vigilance, frequent review of the position, and a reminder to the Minister that there might be a serious outbreak in a few years. Dr. J. M. Gibson said that in his industrial area not more than 25% of infants had been vaccinated, owing to the conscience clause. Results would be better with a voluntary system.

COMPENSATION TO RADIOLOGISTS

Dr. A. Campbell (Edinburgh) drew attention to the possible plight of private radiologists in the new service, for they now had expensive equipment and many operators. Dr. Dain explained that in the service there would be room for every radiologist; and the Minister was prepared to take over at proper valuation the equipment of those wishing to enter the service.

A TRADE UNION ?

Dr. J. A. Gorsky (Westminster and Holborn) proposed that the association should explore the possibility of setting up a body equivalent to a trade union. There was no doubt in his mind that the association, as a body registered under the Companies Act, was not able to turn itself into a trade union. He argued, however, that doctors' contracts were of service rather than for services, and that, this being so, they could form themselves into a union.

Dr. J. O. McDonagh (Perth) said that his division, recognising that the association could not apply its funds to the purposes of a union, suggested the formation of a parallel body. Under the new conditions doctors were simply another group of workers; and in future the association's bargaining position would not be strong enough. Dr. R. P. Liston (Tunbridge Wells) thought that the name "medical guild" would come more easily to the lips of doctors than "trade union." The urgency of the need was underlined by events in the recent crisis, when it had been necessary to set up an Independence Fund as an entity separate from the association. Dr. M. W. Gardner (Brighton) said that in the profession there was a tremendous body of opinion against forming a union. Dr. DORIS ODLUM (Bournemouth) held that among the necessary modifications was redistribution of geographical representation to conform with the new regions.

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(2) That every coroner should keep adequate records, of which copies should be obtainable by interested persons on payment of a fee.

(3) That a consultative committee be set up to consider matters affecting the duties of coroners.

(4) That all inquests be in public; that in the case of an inquest on a "suicide" the press be prohibited from publishing an account of the proceedings and permitted only to publish the fact that an inquest has been held, the name and address of the deceased, and a verdict that the deceased died by his own hand.

(5) That early action should be taken to provide a full post-mortem service on a nation-wide scale.

A further recommendation—that as an interim measure urgent consideration should be given to mobilising pathologists and enabling them to travel to the various outlying mortuaries with fully equipped motorised laboratories—was withdrawn and referred to council after several representatives had objected that this proposal was unreasonable.

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THE STRESS DISEASES

SIR STAFFORD CRIPPS AT ROFFEY PARK

OPENING the new training and research department at Roffey Park Rehabilitation Centre, Sussex, on June 12, Sir STAFFORD CRIPPS, Chancellor of the Exchequer, spoke of the very large amount of sickness absenteeism "which arises not from what in the past we regarded as illness or disease but from those once vague and rather despised causes which passed under names such as neurasthenia," and which the chairman, Lord Horder, had described as stress diseases.

At the present time, said Sir Stafford, the country probably loses 40 million working weeks a year from sickness absenteeism; the average man loses 10 days a year, and the average woman 15 days, from sickness—or 3% and 5% of their working time. Nothing is more wasteful than the casual absence through sickness which often disrupts the flow of production.

> "A great deal of most useful work has of course been done on this subject, but we should all agree that the field is not yet by any means fully explored, and a great deal still remains to be done . . . . Both the Industrial Health Research Board and the Medical Research Council have done much excellent research, but it has not earned the practical appreciation and application which it deserves. If all the findings of those bodies were being applied in practice, we should certainly very much cut down this present degree of stress disease, with great benefits to all of us."

The close relation between stress sickness and industrial morale has been made clear, and it has been shown that the rate of absenteeism arising from this cause is at a minimum where

(1) the selection of employees is made on a proper and sound basis;

(ii) there are adequate chances of promotion for efficient workers;

(iii) there is full knowledge of the purpose and objects of the work; and

(iv) there is stability in the organisation itself.

A good deal of stress disease is being created by management through lack of understanding or failure to take the necessary preventive measures, and that emphasises the need for management and medical science to get together in the attack on this industrial handicap. In the Army during the war much was discovered about misfits and the stresses and strains of putting people into jobs which were either too much for them or too humdrum to engage their interest, and much too was done on selection; but the results of all this work have not received the study they merit in their application to manpower problems in industry.

> "During the war I got set up a committee of psychiatrists and psychologists to study these methods, with a view to their impact upon our post-war industrial problems. The publication of their report last year gave others an opportunity to study their work and the work that had been done in the Army, Navy, and Air Force, and I hope that study will not be neglected, as I am sure there is much to be learnt from it. To some extent we are trying to carry on that work through the panel that has been set up under Sir George Schuster's chairmanship, which is concerned with all the problems of industrial morale. I am delighted that Roffey Park through the person of Dr. Ling is contributing to that study."

The Goodenough Committee emphasised the need to include the problems of industrial health in student and postgraduate courses for medical men, and the Nuffield Foundation has given a lead in establishing university chairs of social and psychological medicine. The present Government increased the money allotted to the University Grants Committee to £12 million a year, much of which will go to medical education.

> "It is up to the medical schools to see to it that the social and industrial problems are given their rightful place in the educational syllabus. In the same way, I hope that the Departments of Commerce and similar faculties will devote some of their curriculum to the questions of human relations in industry. In this way we shall get the problem attacked from both sides simultaneously, which is what we need for success."

It is sometimes forgotten that today some 400,000 persons in this country are engaged in managerial functions of one kind or another, and that there are 12,000 entrants a year, many of whom at present are very ill equipped to appreciate the importance of the psychological factors in human relationships. All this is now recognised as a matter of first-class importance and is no longer regarded as the hobby of a few cranks. But in the average place of employment the practice lags very far behind the theory, and everything possible must be done to bring about the practical application of the remedies and methods that can now be safely advocated as cures or preventions of stress diseases. In the training department at Roffey Park, said Sir Stafford, regular courses are being provided for both doctors and industrialists, and the two partners are being brought into useful contact with one another.

In his introductory speech Lord Horder referred to the growing support for Roffey Park. This centre had treated and resettled 3600 men and women, of whom 80% were known to be working contentedly six months or more after leaving. The breakdowns which brought these people to Roffey arose from a number of causes—"the square peg in the round hole, poor factory conditions, bad morale, poorly trained departmental managers and foremen who spread an atmosphere of suspicion and unhappiness, and, of course, disharmonies in family life." At least 70% of all sickness absence in office and factory was accounted for by the "stress diseases." Prevention lay in training doctors and laymen alike in the fundamentals of healthy mental and physical living in an industrial environment. The impending amalgamation of Roffey Park with St. Thomas's Hospital, under the National Health Service Act, augured well for both institutions.

In England Now

A Running Commentary by Peripatetic Correspondents

CLAIMING priority is a dangerous game—hence this preliminary communication as a feeler before I put in a claim for my "Skymaster œdema."

Skymasters, as every schoolboy knows, are the four-engined Douglas planes which South African Airways use for their express air service between Johannesburg and London. The plane leaves Johannesburg shortly after midnight. The first stop is at Kisumu, at the northern tip of Lake Victoria, where passengers are taken to a hotel for lunch. The next stop is the same evening at Khartoum for dinner. Then, flying all night again, this time over the Sahara, there is a stop just before dawn at Castel Benito, the airport for Tripoli, and the next hop brings one to Heath Row, where the plane is scheduled to land shortly after midday. So the whole trip of some 6000 miles takes just over thirty hours. When full, the plane carries over forty passengers. No sleeping bunks are provided, and though the seats can be tipped back it is practically impossible to do so to any extent when the plane is full because either the back of your seat smothers the passenger behind you or your feet stick into the back of the passenger in front of you. The most that one can hope for during the two nights in the plane is to sit in a semi-recumbent position.

My attention was first drawn to the "new" disease by a senior colonial medical officer who had flown out to Johannesburg in this plane. Being of the old pioneering school who believe in being as comfortable as possible under all circumstances, he took his shoes off before settling down for the night. On waking in the morning he discovered that his ankles were so swollen that it was extremely difficult to get his shoes on. Visions of unsuspected cardiac or renal disease rose before him, but as a good Irishman he refused to be perturbed, and within twenty-four hours the œdema had gone and did not recur. A few weeks later a distinguished South African physician told me he had been consulted by a middle-aged lady with the same story.

When I flew home by Skymaster I was therefore well primed, and on settling down for my first night in the air I kept my shoes on. I examined my ankles at breakfast-time and there was nothing to swear to, so I began to think that my two "cases" must have what our American friends call "some underlying pathology." After my second night in the plane, however, both feet and ankles had the loveliest pitting œdema I have ever seen. And I can now sympathise with my patients when they complain of aching in their œdematous feet. It took about forty-eight hours for the pitting to disappear, and during this period my feet ached steadily whenever I walked about. That I was not the only victim was evident when I quietly studied the lower extremities of the other passengers; several of them had definite swelling.

The obvious comparison is with the "shelter legs" of the war. But this mainly affected elderly people, whereas I am nearer forty than fifty and my first informant was only just on the wrong side of fifty. Then again, shelter leg was supposed to be due to sitting still all night in a cramped position on a deck-chair, with the cross-bar obstructing the venous return. I admit that the conditions in the Skymaster (*pace* S.A.A.) could be described as cramped, but there was no hard bar at the front of our well-padded seats, and certainly in my case there was no question of keeping still all the time—on the contrary, one was continually turning from side to side, crossing and uncrossing one's legs and stretching them, trying to find a comfortable position. Perhaps I should add that the Skymaster has no pressurised cabin, and that at no time did we fly above 5000–7000 feet.

This may well be a recognised condition,* but I have yet to meet someone who knows about it. This brief note will have served its purpose if it allays the anxieties of passengers who awake to find their ankles œdematous.

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* Alas for priority! A leading article on shelter legs in 1940 (ii, 722) mentioned that a similar condition had been seen in people flying home from Cape Town.—ED. L.

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The close relation between stress sickness and industrial morale has been made clear, and it has been shown that the rate of absenteeism arising from this cause is at a minimum where

(1) the selection of employees is made on a proper and sound basis;

without any publicity being given to them and without any complaint being made on that account.

Fellows of the college are quite at liberty to express and publish any views they may hold, but those attending a meeting at the college are not entitled to speak for the college as a whole. The council is charged with that duty, and also with taking such action on the views expressed at meetings as they may think fit. Pronouncements by the president have been made with the approval of the council, the body which has full responsibility and can be regarded as representative of the fellows as a whole.

The Royal College of Surgeons is an academic body and was founded, and granted powers and privileges, "to promote and encourage the study and practice of surgery." It fulfils these functions by maintaining high standards of examination for its diplomas, and by using its unique facilities for research and postgraduate education to the fullest possible extent. These are the true functions of the college, and its constitution is designed for their fulfilment. I quite agree that the college is not so constituted as to be an adequate body for day to day medicopolitical negotiations, and the council has repeatedly expressed this view.

Finally, I hope that the signatories of the letter in your columns will cease trying to use the college as a public platform for political purposes, and will join with the council and the majority of fellows in supporting the college, interesting themselves in its activities, and doing their best to carry it forward to an even greater position in the world of surgery than it has occupied in the past.

WEBB-JOHNSON
Royal College of Surgeons of England.   President.

THE GEOGRAPHICAL ORIGIN OF NURSES

SIR,—Though greatly impressed by Dr. Woolf's thorough and interesting study of this subject in your issue of June 19, I cannot help feeling that his conclusions lose some of their potential validity because of the method of geographical subdivision which he employed. To lump the county of London and the county boroughs together as "town" and to call the rest of England "country" shows some lack of appreciation of the typical English social pattern.

The population of the county of London is roughly 4,000,000. The population of the Metropolitan police district is about 8,000,000. Even when adjustments are made for the three considerable county boroughs in Greater London, a population not greatly less than that of the county of London lives in extrametropolitan London and has more in common with Dr. Woolf's "big-town" class than with his "rural" class. In all the other principal population centres of the country there is a pattern of city or great-town centre, with a small-town and suburban fringe separating it from the countryside and regarding itself as town rather than country; and in most cases the "fringe" population is not greatly less than that of the central city. Certainly, the majority of Dr. Woolf's "country" girls are not country-dwellers in any sense except the special and arbitrary one in which he uses the term.

The dullness of rural life probably plays some part in driving country girls into nursing, but two other important factors are seen to operate when one appreciates the true nature of the difference between the population groups concerned. "Fringe" areas usually contain a greater proportion of middle-class people than do "great-town" areas. In addition, great-town areas are more highly industrialised than fringe areas.

Hospitals tend to regard the middle-class girl as a better potential nurse than the working-class girl, because of her "better" educational and social background. Those fortunate hospitals which can still pick and choose their recruits, because of the glamour associated with their reputations and histories, deliberately pick the middle-class girls. In this way the great London hospitals and some of the major provincial hospitals close the door to town girls from their own areas. Again, it is anything but easy for a girl to live on the salary a probationer receives, even under the Rushcliffe scales. So long as the nurse's pay is kept low because of her "student" status, we can expect most recruits to come from the social group which can afford to subsidise its children's living up to the age of 21.

In the industrial areas the hospital is competing with the factory for its recruits, and the hospital is doomed to failure from the start. The factory offers more money and more freedom, and will accept its recruits at the age of 15. Other things being equal, the hospital might have an equal chance with the factory if both were willing to take the girl who had just left school; but nursing will find it hard to attract the girl who, at the age of 18, has already spent two years in another job.

It certainly behoves the hospitals to do what Dr. Woolf suggests: this will help them in any form of competition. But the problem is not merely one of recruiting the town girl: it is one of recruiting the working-class girl, to whom and to whose family economic considerations loom large. And in spite of the Working Party's cavalier dismissal of the "gap" between school-leaving age and entry upon nursing training, the possibilities opened up by prenursing training courses, especially when these are combined with maintenance allowances or with paid practical work in association with local authority or other medical services, are worthy of a good deal of study.

JOHN D. KERSHAW
Colchester.   Medical Officer of Health.

REGIONAL ILEITIS

SIR,—Perhaps I may make a few remarks on your interesting leading article of May 29. These are based on 12 cases seen in private practice between 1939 and 1947, and on others seen by me in the Army during the war, or in consultation. Some of them had been diagnosed as ulcerative colitis on account of chronic diarrhœa, and the true diagnosis was established only by investigation. A further indication for investigation was complications, among which the following were noted: retarded growth and development (intestinal dwarfism in one case), when the disease arose in childhood: mental abnormality, such as retarded intelligence or anxiety state; hyperchromic or hypochromic anæmia: iritis or iridocyclitis; and, once, non-union of a fracture.

The X-ray findings may clinch the diagnosis, but there is often supporting evidence—intermittent pyrexia, diarrhœa, leucocytosis, increased blood-sedimentation rate, intermittent occult blood in the stools, and increased fæcal fats.

The radiological examination (barium meal and barium enema) practically always shows a positive string sign of Kantor. At the same time, other abnormalities can be noticed: calcifying lymphadenitis in the right lower abdomen, and a cæcum irregular in outline and placed higher than normal. Radiology alone can reveal the extent of the disease, which may start practically in the stomach, affect intermittent parts of the jejunum and ileum, and be manifest also in the colon as segmental or polysegmental colitis.

The methods described here have been employed in all cases of chronic ulcerative colitis, a great number of which proved to be amœbic in origin; treated as such, they were greatly improved or cured. In almost all these cases the stools contained *E. histolytica*. In some the possibility of an amœbic infection was evident only after routine radiological examination of the chest, which showed an abnormally raised and irregular right diaphragm. The cases which were not proved to be amœbic could be divided into segmental colitis (Crohn) and idiopathic ulcerative colitis. In the group of segmental colitis, typical string signs were found in the terminal ileum, in addition to the abnormality in the colon; whereas in idiopathic ulcerative colitis no abnormality of the ileum was found; and the investigations did not show any signs of tuberculosis, diverticulitis, or other disease.

It is often suggested that chronic ulcerative colitis is the expression of an anxiety state or of some psychosomatic disorder. In my cases the disease persisted, though the general condition benefited by psychological treatment. Such a case was seen in July, 1947, and reinvestigated recently. Although the patient's general condition was greatly improved—her weight had risen from 9 st. 3 lb. to 10 st. 3 lb.—the radiological appearance of the colon had certainly not improved.

I don't know whether it's worth reading the medical journals each week (except of course for this column). My brain gets very battered having new facts put in so often and then having them extracted again. I was thinking last night of the number of things I have read which I later find refuted in another article, sometimes within a few months: just when I'd mugged up about fibrinoid necrosis of glomeruli causing vicious circle hypertension, I read elsewhere that all rats have got fibrinoid necrosis anyway and that the other work might be invalid. Just when I had it clear that crush syndrome kidneys got cortical necrosis from a nervous mechanism making the medullary bypass open out and the cortical vessels close down, somebody says that the cortical vessels are squashed by swollen cells and it isn't a nervous mechanism at all. Again, what about breast-milk? I've read in the last year that thyroid increased it, then that iodine alone was better still, and just lately that iodine doesn't increase it after all.

I really don't know what to believe or which side to take. If one keeps on packing and unpacking a suitcase with different contents everything gets muddled, containers burst, and toothpowder and hair-lotion impregnate the shirts and socks. That's what's going to happen to our brains if we go on poking in facts and plucking them out at the same time.

Some beliefs are cherished a long time before some pundit kills them for us, and the extraction of a firm-rooted belief is as unpleasant as the removal of an impacted wisdom tooth. I was brought up to believe that pulmonary œdema was due to left ventricular failure, but apparently it isn't today. As a student I fondly believed digitalis worked by shielding the ventricles from the futile rampagings of the auricles above them, but the Hammersmith chaps say I must cross it all out now and talk about right auricular pressure. We used to be taught that the rock dust and not the coal dust hurt the miners' lungs, but I see that the coal dust is the villain after all. Spina bifida has nothing whatever to do with enuresis, though it had when I was a boy. Though I'm anything but clever, as Captain Corcoran remarked, I could talk like this for ever.

What's to be done? I'm getting suspicious and distrustful of all medical literature, and I've a jolly good mind to cancel my subscription to THE LANCET and become a stockbroker. Stocks and shares are no more variable than medical theory, and one can make money out of *their* fluctuations.

* * *

A close study of the student nurse's education, in theory and practice, should be compulsory for any member of the medical profession concerned with its reorganisation. The only way to know what is going on is to hear from the student nurses themselves how and what they are taught. I have been following with interest the progress of a girl who entered the P.T.S. a few weeks ago.

Having "done" the skeleton in a week or two, with a distant view of the various bones during lectures and a closer view obtained in competition with fifteen other people, she was required in a test paper to draw a diagram of the skull. Joints were disposed of in an hour, in a practice-lecture by a sister-tutor in training. Now the muscular system has been dealt with, though no student has yet seen a muscle and the names are a curious conglomeration of old and new terminology. Somehow, the authors and illustrators of nursing textbooks never agree, so that the inguinal ligament of the text becomes the Poupart's ligament in a diagram, to add to the nurse's confusion.

In practical nursing they have all seen a dummy carefully washed with real soap, although the student nurse receives but one soap coupon a month. This dummy is invaluable, but when it came to a practical demonstration of enema technique the *two* holes (intake and output) provided (what will the nurse make of this anatomical arrangement?) were not used, and the enema was given into a basin.

* * *

A rural health visitor, having vividly described the dangers of raw milk to her little audience, asked whether in future they would order only pasteurised milk. "Nay," answered one thoughtful mother, "ah doan't think ah shall; ah'd rayther drink a menagerie than a cemetery."

Letters to the Editor

THE ROYAL COLLEGE OF SURGEONS

SIR,—I regret that the fellows of the Royal College of Surgeons of England who signed the letter in your issue of June 19 (p. 963) feel that they have a grievance about the conduct of meetings which have been held in the college in recent years. They were conducted strictly in accordance with the by-laws and regulations of the college. For the information of the general body of fellows it will be well for the facts to be put on record.

The meeting held on April 28 of this year was summoned with the approval of the council in response to a requisition signed by thirty-three fellows. It was, as stated by your correspondents, the first meeting of fellows since the National Health Service Act became law at which resolutions were in order.

There had, however, been the annual meeting of fellows and members in November, 1947, when questions relating to the Act could have been the subject of resolutions; but no notices of motion were received and there was no quorum at the meeting.

There had also been the meeting of fellows on Nov. 29, 1946, referred to by your correspondents. The council agreed to this meeting being summoned before Nov. 30 "for the exchange of views," in response to an urgent request at the annual meeting of fellows and members on Nov. 13, 1946, at which again there was no quorum. It was made clear that resolutions would not be in order since the statutory notice could not be given. The general opinion of the meeting was however expressed in a recommendation that the college should act in conformity with the general feelings of the profession in regard to the question of negotiating on the regulations of the Act. The council held the view that negotiations should take place, but, when the majority of the profession favoured the opposite course, they acted as requested.

Three resolutions were passed at the meeting on April 28 this year. They were as usual submitted to the council for consideration and such action as they might think desirable. The first resolution, which was passed *nem. con.*, urged the council that opinions expressed at the meeting be represented to the Minister of Health. This was done. The terms of the other two resolutions, which were passed by 153 to 73 and 67 to 58, were taken as representing the views of the meeting. The council were opposed to the resolutions but in accordance with usual practice members of the council did not vote. The resolutions were sent not only to the Minister (who personally acknowledged them) but also to the Negotiating Committee, through which body the council has acted in representing views to the Government. It can hardly be maintained, therefore, that opinion has been suppressed.

Meetings at the college are not public meetings; and representatives of the press, either lay or medical, are not invited as a rule, though the annual meeting of fellows and members is sometimes attended by representatives of the medical press. College meetings are held for the receipt of council reports and to enable those present to put their views before the council. Resolutions which are passed are reported to the council, which is responsible for the government and management of the college, and is representative of the fellows as a whole, not only those who happen to attend any particular meeting.

It is usual for proceedings at collegiate meetings to be confidential. Occasionally a college may issue resolutions for publication, but the proceedings of meetings are not usually open to the medical or lay press. The by-laws and regulations of the Royal College of Surgeons are strictly drawn in regard to the management of meetings, with a view to preventing them from being used as a means of publicity or an opportunity for propaganda.

During the discussions on the National Health Service Bill before enactment, many resolutions were passed at meetings of fellows, and of fellows and members. These were dealt with in exactly the same way as the later ones, and were sent by the council to the Negotiating Committee, and sometimes to the Minister of Health,

TWO QUALITIES OF SERVICE?

SIR,—You are to be congratulated on your annotation ast week. Surely the real difference in the future between a private and a State patient will be that the former will have an appointment to see his doctor at a time convenient to both, whereas the latter will attend at the doctor's regular consulting hours and take his turn with others.

Worthing. **HAROLD LEESON.**

ARTIFICIAL LIMBS

SIR,—Recent articles and letters in the press have referred to the artificial limbs to be provided in the new service as "standard" or "utility" limbs. As one of the firms of artificial-limb makers appointed to supply these limbs we have no knowledge whatsoever of a "standard" or "utility" limb. The limbless sent to us to be fitted with artificial legs each constitutes an individual case, and there is no such thing in our experience as standardisation. The appliances for children and adults born with congenital deformities are also individual in design for each case. Because of the size of our organisation we can employ specialist fitters for each site of amputation (incidentally we have no knowledge of a "standard amputation" but only of a good or bad stump for fitting) and we are probably the only firm in the world doing this.

To allay other fears which have been expressed we should like to make it clear that we have for years past carried out repairs to artificial legs of all makes, and we are in a position to continue to do so.

J. E. Hanger & Co. Ltd.
Roehampton.

A. W. SHAW
Managing Director.

HEALTH CENTRES

SIR,—One aspect of the proposed and now, alas, postponed introduction of health centres has not, I feel, been sufficiently stressed. This concerns the relationship between general practitioners and consultants. I believe that the extra facilities, such as radiological departments and laboratories, made possible by establishing health centres, would bring about a more normal and healthy relationship.

Fifty years ago, before the technical side of medicine became so advanced, a practitioner would seek the advice as consultant of a man whose clinical acumen was respected or who had had special experience in a particular type of disorder. The consultant would approach the case with the same implements for examination as the practitioner—i.e., his eyes, ears, sense of touch, and so forth. Nowadays, however, the practitioner starts at a technical disadvantage, since he is not in a position to use many of the methods of investigation in which he has been trained, and which would be useful to him. Hence the hospital specialist or consultant is now in some respects valued more because he has resources for these methods than because of his clinical acumen or experience. His work is greatly increased because many cases are sent not so much for advice as for that extra investigation. The diagnosis of pernicious anæmia, though it can be made very nearly by a laboratory technician, can seldom be made with any certainty by the general practitioner.

A properly organised system of health centres with direct access for the practitioner to laboratories and radiography facilities would improve the efficiency of the medical services in several ways:

1. It would reduce the amount of outpatient work at hospitals.

2. It would allow the general practitioner to use the methods of examination and investigation by which he has been trained to diagnose disease, and so greatly increase the quality and interest of his work.

3. It would counteract the tendency in the occasional less conscientious practitioner to become merely the tenant of an office for dispatching patients to hospital.

4. It would put the consultant and the general practitioner back into a proper relationship with one another, in that, on the whole, they would approach a case on the same terms. The consultant would not need to be called in for help in diagnosis solely because the practitioner was unable to do the investigation, but only because he was not certain of his interpretation of the findings.

It may be said that general practitioners would not have enough experience to prevent them overlooking disease or making mistakes through misinterpretation. I have even heard a case quoted, as an argument against such facilities in health centres, in which a healthy kidney was removed because the practitioner had mistaken a staghorn calculus on one side for a normal pyelogram. Without adequate safeguards such misinterpretations could possibly take place, but with visiting radiologists and pathologists to check X-ray and laboratory findings they should be rare.

A final word must be said on the differences of opinion about the scope and structure of "health centres"[1]—differences fostered by this rather vague name for them which could be abandoned with advantage. Some think of the centre as similar to the Peckham Health Centre, which concentrates on frequent overhauls of the healthy population. Others think of it as an outpost of a hospital in hitherto unserved country, and run by specialists and consultants as a kind of branch outpatient department. Much can be said in favour of both these ideas; but the first cannot be widely applied for many years, while the purpose of the second would be better served by having more hospitals with outpatient departments.

What is required, whatever its name, is a centre where practitioners can work under good conditions, with administrative staff to look after records and notes, and where they have direct access to those pathological and radiological services, without which they literally cannot nowadays make a diagnosis.

Barry Accident and Surgical Hospital. **H. M. GRANT.**

ATTACK ON RHEUMATISM

SIR,—In his letter of June 19 Dr. Stone is attacking the word "rheumatism," not the group of diseases. This word has the advantages of antiquity and of being customarily accepted. Any substitute must prove its worth.

The *Shorter Oxford English Dictionary* defines rheumatism as "a disease of which inflammation and pain of the joints are prominent features." The *Encyclopædia Britannica* states that rheumatism is a "general term for various forms of disease subdivided as follows: acute, subacute, chronic, muscular, and arthritic." It is clear that "rheumatism" refers to a group of diseases affecting a section of the body—the muscles, joints, and allied structures. "Rheumatology" therefore is the special aspect of medical science that cares for this group of diseases. The definition, admittedly loose, is anatomical. The neurologist deals with diseases of the central nervous system—an anatomical division—but no-one complains because tabes and disseminated sclerosis are not clinical varieties of the same disease.

The causation of many of the rheumatic diseases is unknown, but that is no reason to object to the term. If it were, then other branches of medicine would be in need of similar treatment. Altering the name of this group of diseases will not bring divine inspiration and solve our problems.

The example quoted by Dr. Stone is comparable to such a phrase as: "This man has palpitations; are they neurotic?" Misuse of words by others is no reason for changing them. No-one suggests that neurologists should be styled "nervous physicians," or that there should be such terms as "geriatric physician" or "venereal surgeon." I can see no reason why the term "orthopædic physician" should be introduced, if only because I should not like to see broken bones in the rheumatic clinic.

London, S.W.1. **DAVID P. NICHOLSON.**

St. Thomas's Hospital have once more published their list of old students. This first post-war edition also contains the school's roll of honour and the names of those who have died since 1938. The kindly pre-war custom of free distribution has had to be reluctantly abandoned, but copies may be had from the beadle of the medical school for 2*s.* 6*d.*

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[1] *Lancet*, 1947, i, 32.

Lastly, I should like to mention the following case of a man who first came to me in May, 1947, with four weeks' history of abdominal pain and loss of weight (1 st.). During this period he had had two or three severe attacks of acute pain, each lasting about twelve hours.

While serving in the Army, this patient had repeated attacks of diarrhœa and abdominal pain. He was investigated on several occasions, with completely negative results. There had been a tendency to diarrhœa since 1941. He was discharged from the Army in 1945, diagnosed as an anxiety state. Clinical examination revealed a large mass in the centre of the abdomen which was movable, and could be felt at the right and left of the umbilicus. At times a well-marked increase of peristalsis in the left abdomen was noticed. A provisional diagnosis of subacute small-intestinal obstruction due to Crohn's disease was made. Operation on May 30, 1947 (Mr. E. W. Riches), showed subacute obstruction of the jejunum, caused by acute jejunitis (Crohn's disease) of mid-jejunum. In addition, four other areas of this disease were found. In the terminal ileum—the classical position—only the scar of previous inflammation could be seen; but other areas showed signs of healing, or were in a subacute non-obstructive stage. There was extensive lymphadenitis.

From my cases I did not derive the impression that this disease is more prevalent among Jews than others, only 6 out of a total of 24 patients being Jewish or of Jewish extraction.

London, W.1. LEO RAU.

POST-CRICOID PHARYNGO-ŒSOPHAGEAL PERFORATION

SIR,—"When the head is *extended*, as it *must* be during the introduction of the . . . œsophagoscope . . . ." (my italics). This sentence at the foot of p. 986 (Mr. Goligher's article of June 26) caught my attention, since for 20 years I have preached and practised, in some hundreds of cases, the exact opposite. I am aware that the view is current. But extension of the head, and still more extension of the neck which is hard to avoid if the head is extended, means that the instrument is brought up hard against the seventh cervical vertebra, and may even inflict damage in that region. It is usually possible to introduce an endoscope with the head extended, but it is always much easier and safer with the head and neck fully flexed forward. Let anyone try; it is clear at once that in flexion the instrument passes directly down the lumen of the œsophagus in the natural line of that lumen—the better the flexion, the easier the manœuvre. I commend this point particularly to the novice, especially when he is searching for a foreign body. Of course, once in the œsophagus gradual extension is needed for further progress; indeed, on my own operating-table (Thackray) there is an additional joint to provide mid-dorsal extension on approaching the cardia. But for the introduction of any instrument the rule, for ease and safety, should be "full flexion of neck and of head on neck."

Bristol. E. WATSON-WILLIAMS.

BACTERIOLOGICAL NOMENCLATURE

SIR,—Unless workers in this country express their disapproval more strongly than they have done in the past, Bergey terminology is likely to become the international standard for bacteriological nomenclature. This country is adequately represented on the Nomenclature Committee of the International Association of Microbiologists, but on the more important Judicial Commission on Bacteriological Nomenclature we are represented by a mycologist. One of the permanent secretaries, Dr. R. St. John-Brooks, formerly acted as the mouthpiece of British bacteriologists, but since he now lives in the U.S.A. he is no longer in a position to represent opinion in this country.

It is important that some means should be found to keep our representative on the commission informed on the views of British bacteriologists, and an advisory nomenclature committee, preferably set up by one of the scientific societies, could do this. All British members of the International Nomenclature Committee would be on this committee and its other members would be bacteriologists representing medical, veterinary, agricultural, and industrial interests. The committee would have two main tasks: first, to define genera and species that should be afforded recognition; secondly, to review and prepare opinions on the problems to be considered by the International Judicial Commission at its next meeting. Many of these problems are highly controversial, and, unless our sole representative is adequately briefed, British bacteriological opinion is not likely to be heard by the commission.

S. T. COWAN.

National Collection of Type Cultures,
Lister Institute, Elstree.

CURARE IN ANÆSTHESIA

SIR,—As you pointed out in an annotation two years ago,[1] it was Bennett and Griffiths in Canada who revived the interest of clinicians in curare. But as early as 1912 Laewen, the German surgeon, was using curare for muscle relaxation in anæsthesia.[2]

Zwickau, Saxony. MAX DETLEFSEN.

SCHOOL DOCTORS AND THE ACT

SIR,—What is the position of school doctors under the Act? I have received a notice from my son's preparatory school telling me that the school doctor will accept the boys as patients under the Act, but in addition there will be a termly charge, which is to be paid to the doctor as an honorarium for his visiting the boys at school instead of insisting that they should go to his surgery. I felt that it was contrary to the spirit and the letter of the Act that the doctor should receive payment apart from the capitation fee for patients on his list. I rang up the Ministry of Health and they confirmed my view that the procedure was "highly irregular," but they admitted that the particular problem of *visits* of school doctors had not yet been considered.

I have since been told that the Preparatory Schools Association is recommending the payment of an honorarium to all school doctors, and I know of at least one public school at which the same thing is proposed.

FATHER OF EIGHT.

EARLY DIAGNOSIS OF GASTRO-INTESTINAL CANCER

SIR,—In the first decades of this century, at a time when great emphasis was laid on painstaking examination of the abdomen, two forms of gastric cancer were distinguished: one palpable and the other impalpable. In those days it was generally admitted that cancer of the stomach is nearly always inoperable, for by the time that the tumour has become palpable it has extended over a great part of the stomach and of the regional glands. Sometimes however—for example, with tumours involving the posterior wall of the stomach and invading the pancreas—the condition may become inoperable without the tumour ever being palpable.

It is deplorable that, as Mr. Hermon Taylor makes clear in his article of April 17 (p. 581), the position is still substantially the same. Moreover, tumours elsewhere in the digestive tract may also remain symptomless for a time, the appearance of symptoms being followed quickly by the state of inoperability. It thus seems desirable, as Mr. Taylor says, to adopt some method which will indicate the presence of a tumour of the alimentary tract in general, even if this method gives no evidence of the exact location. More than 30 years ago I pointed out, for the first time, the significance of finding occult blood in the fæces.[3] It was then shown that this finding is not characteristic of chronic peptic ulcer but is constant with cancers of the alimentary tract, irrespective of their site. Mr. Taylor proposes that each year 1 in 25 of the 45–60 age-group should undergo radiological examination. I suggest that each year every person in this age-group should have two examinations of the fæces for occult blood. The test is easy, cheap, and quick. If the patient is properly prepared, and if other conditions which may cause it to become positive—e.g., pyorrhœa, hæmorrhoids, and congestive heart-failure—can be ruled out, a positive result would call for a detailed X-ray study.

Sydney. EUGENE J. ROSENTHAL.

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1. *Lancet*, 1946, i, 424.
2. *Beitr. klin. Chir.* 1912, 80, 168.
3. Rosenthal, E. J. *Berl. klin. Wschr.* 1916, no. 35.

I am hoping that as we gain accumulative experience this practice will disappear. I am sure that it is believed in only by a very small minority of the medical profession, and I believe that as experience develops this alleged dichotomy in that service will be prevented. But, as I have said, such conduct is entirely unethical, and ought to receive the disapproval of the House and the country.

Mr. Wilson Harris: Is there any specific remedy when, as in a case which I know myself, a doctor refuses to take a patient on the grounds that the patient is in a position to pay, and therefore will not be accepted on the general list?—Mr. Bevan: If there are patients who are so informed they can, of course, go to another doctor. If at the end of the process there are patients who are without a doctor they may be assigned to one.

Mrs. Mabel Ridealgh: Is the Minister prepared to take action at a later date in cases where a doctor is prepared to take a husband and wife, but refuses to take the children unless the parents pay private fees for the children?—Mr. Bevan: There have been one or two instances of that kind. I believe that this action is also frowned upon by the medical profession and it only serves to show how necessary it is to organise this profession into a service for the nation as a whole in order to raise its standard of conduct.

Dr. S. Segal: Will not the Minister enlist the active coöperation of these patients in reporting such cases to the proper authority?—Mr. Bevan: They are obviously making their complaints known now, otherwise we would not have heard about them.

Patients Outside Doctor's Area

Mr. G. C. Touche asked the Minister if he was aware that some persons joining the National Health Service had been told that they could not retain the services of the doctor whom they had engaged for several years because they lived outside the area for which the doctor was zoned; and if he would amend the regulations to enable such persons to retain the services of their present medical advisers.—Mr. Bevan replied: A doctor has the right when joining the service to fix the area within which he will visit patients in their homes, as he is required to do when necessary. There is nothing to stop him accepting patients who live outside this area provided he is prepared to visit them.

Decentralisation of Local Health Services

Mr. G. H. Oliver asked the Minister, having regard to the decision of the Derbyshire county council not to delegate any of the duties under part III of the National Health Service Act to the borough of Ilkeston, how many county councils had disregarded his advice in adopting this course; and whether he would effectively intervene in cases where the health services were permitted to fall below the present standard of efficiency.—Mr. Bevan replied: Of 62 county councils in England and Wales, 27 have not decentralised the administration of their health services, but this figure includes some counties in which decentralisation would be inappropriate. I should certainly intervene wherever services of a proper standard were not being provided. Mr. Oliver: Could the Minister be induced to ask the county councils exercising their discretion not to delegate their powers under part III to state their reasons for their action to the smaller authorities whose health service they intend to supersede, particularly when the service is being run efficiently?—Mr. Bevan: The local authorities are acting within their powers and I have no statutory power to interfere. I can only intervene if the standards of the service are not high enough.

Maternity Medical Services

Mr. Somerville Hastings asked the Minister why he had decided to reverse the policy of Statutory Instrument 506 as regards the method of obtaining maternity medical services by encouraging doctors who had had no midwifery experience to undertake maternity work and arranging to pay them for it.—Mr. Bevan: I have decided after consultation with the medical profession to provide a lower fee for maternity medical services undertaken for his own patients by a doctor with ordinary experience. Such a doctor could not otherwise receive any fee for such services, either from public funds or from the patient. This does not affect the higher fees for special experience or the main objective that maternity work should generally be done by practitioners with such special experience. Mr. Hastings: Does this not mean that doctors who have seen no midwifery cases for 20 years or more will be able not only to undertake them but will be paid for them by the nation, and does he not think that this is a public danger and a scandal?—Mr. Bevan: This does not alter the existing situation. A general practitioner can do obstetrical work now and does it, so there is no new scandal being created. What is happening is that a new system is being introduced which will mitigate the present evils and I hope before long entirely remove them. Mr. Hastings: Does not the Minister feel that as he is responsible for the quality of the service he ought to take some steps to see that it is of a sufficient quality?—Mr. Bevan: Steps are being taken. The scheme is to create a panel of general practitioners who will do obstetrical work and relieve other general practitioners without the same experience from doing it. This will in fact powerfully modify and improve the existing practice.

Commander T. D. Galbraith: Can we really give official recognition to what is an undesirable practice?—Mr. Bevan: I cannot quite understand what the hon. Member means. What this means is that a doctor will be paid for obstetrical work if he does that work for his own patient at the request of his own patient. This is, in fact, an attempt to preserve the relationship for which hon. Members opposite have clamoured for two years.

Call-up of Medical Practitioners

Sir Ernest Graham-Little asked the Minister whether he was aware that the recent call-up of young medical practitioners, notwithstanding earlier representations that the supply was more than adequate, had caused hardship to those holding A appointments at the hospitals, who would thus be prevented from proceeding to B2 appointments, with detriment to their professional careers and, in particular, would make it impossible fully to carry out the recommendations of the Goodenough Committee, which declared that house-appointments for one year should be the minimum experience for the young practitioner before commencing practice; and if he would rectify this position.—Mr. Bevan replied: I am fully aware of the implications of the decision referred to. The Medical Priority Committee, on whose advice the decision was taken, recommended it as an exceptional means of meeting an expected deficiency in young practitioners for the Services during the second half of the year. The position will be reviewed towards the end of the year.

Supply of Artificial Limbs

Captain John Crowder asked the Minister of Pensions whether patients applying for artificial limbs under the National Health scheme after July 5 would be supplied with only one type of limb; and whether orders would be placed only with his department's sole contractors.

Sir John Mellor asked the Minister why, under the National Health Service, artificial limbs might be supplied by two firms only, to the exclusion of all other makers; and whether he would enable users to choose any make of limb preferred, provided additional expense does not fall upon public funds.

Mr. George Buchanan replied: This matter is under consideration. I hope shortly to be able to make a statement.

Captain Crowder: Is it the present position that a disabled man who wants his artificial limb repaired will have to pay for it himself unless he goes to one of the Government's sole contractors?—Mr. Buchanan: The present position is that the scheme is not started, so that at present a person other than an ex-Serviceman must pay for it unless he comes under a Ministry of Labour scheme. However, this matter is being considered, and I would like to leave it at that at the moment.

Sir John Mellor: Cannot the Minister give an assurance that users will be permitted to make their own choice provided no additional expense falls on public funds?—Mr. Buchanan: I hope people will be reasonable on this matter. I hope I am not an unreasonable Minister, and I hope that the people I am negotiating with in this matter will bear in mind the general interests of the community. If all of us are reasonable, I am sure we can work it out in a reasonable way.

Mr. Louis Tolley: Will the Minister make a statement at the earliest possible moment? I can assure him that many disabled men are showing real concern at the fact that in all probability in the future they will not be able to go to the makers for repairs and replacements, and they are disturbed as to what their future is likely to be.—Mr. Buchanan: In my view they need not be disturbed at all. I do not want any Party conflict on this, but nobody need be disturbed. The limb we make now is made for the persons who served in H.M. Forces during the war. That has been done for years without any reasonable complaint.

Public Health

Scarlet Fever in Lanarkshire

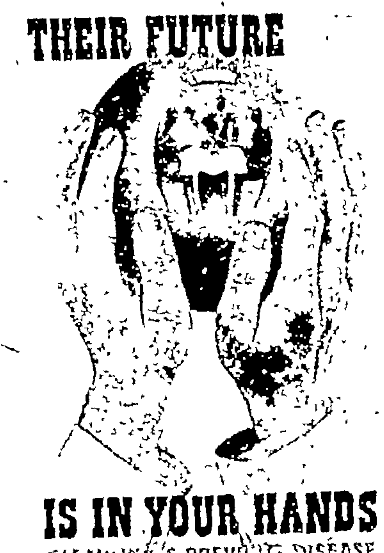
OVER 70 cases of scarlet fever were reported in the Lanark area between June 10 and June 17. All of these patients had eaten ice-cream from a shop in Lanark, where two assistants were found to be carriers of a hæmolytic streptococcus. The shop was closed for disinfection, and farms in the district were visited to make sure that workers handling milk were not carriers. The outbreak has now subsided.

Food-poisoning from "Cream" Buns

The medical officer of health for Lambeth has reported that on and after May 19 there were 93 cases of food-poisoning in this district, in all of which synthetic cream was incriminated. Each of the patients had eaten the cream in buns and cakes sold by the same confectioner on May 15. *S. typhi-murium* was isolated from a sample of cream taken on the 18th. At the bakery supplying the confectioner it was found that one of the staff had been absent from work with an illness suggesting food-poisoning; and *S. typhi-murium* was isolated from the fæces of another employee. The M.O.H.'s report points out that a local authority can legally forbid a carrier of enteric or dysentery to handle food for human consumption but that similar measures cannot be taken against a carrier of salmonella organisms. The M.O.H. urges that this discrepancy should be corrected.

Towards Cleanliness in Catering

A campaign launched by the British Tourist and Holidays Board, with Government support, has as its object the promotion of improved hygiene in the various sections of the catering industry. As the first step, attention is being drawn to the dangers of infected food and utensils and to the importance of personal cleanliness. Each of the 184,000 catering establishments in the United Kingdom has been sent posters and aluminium plaques for exhibition in staff quarters. One of the posters is reproduced here. Another, showing a dirty knife casting a shadow of a dagger, has this caption: "*Dangerous Weapons—Dirt Means Disease. Keep Foods, Hands, and Utensils. Clean.*" The theme of clean hands is continued on the plaques, which are designed to hang over wash-basins and in lavatories. Managements and staffs are to be invited to conferences at which the dangers of unclean habits in their work will be discussed.



Parliament

QUESTION TIME

Treatment under the National Health Service

Mr. H. E. RANDALL asked the Minister of Health how many instances of doctors informing their patients that there was a restriction on drugs which might be ordered for free supply for the proper treatment of patients under the new health service had been brought to his attention; what steps he had taken in the matter; and what action was open to patients so informed by their doctors.

Mrs. LEAH MANNING asked the Minister if he was aware that certain doctors were urging patients who go to them to be placed on their register to remain as private patients on the grounds that they would in that event receive better attention and be entitled to certain drugs which they could not have as National Health patients; and what steps he proposed to take to prevent such action.—Mr. ANEURIN BEVAN replied: I trust there have not been many such cases, and I am confident that doctors will not attempt to discriminate between those who use the service and those who do not. Moreover, I welcome this opportunity to make it clear that patients are entitled under the new health service without restriction to every kind of drug and appliance necessary for their treatment. Indeed, any doctor who failed to prescribe those drugs would be breaking his terms of service.

Mr. RANDALL: Is the Minister aware that two such cases have been brought to my attention? Will he give an assurance that he will make the fullest inquiry? Furthermore, will he answer the latter part of the question in which I ask what appropriate steps can the patients take when a doctor makes this statement?—Mr. BEVAN: The course open to the patient is to make a complaint to the local executive council and that body will investigate the complaint. There is machinery under the Act to deal with this matter.—Mrs. MANNING: In view of the fact that I have also sent two cases to the Minister, and as this is a matter which is causing great anxiety among people of all parties, and belonging to many classes, who have looked forward to being free from the burden of doctors' bills in the future, can he tell the House what steps he himself will take to end this rather disgraceful action on the part of some doctors?—Mr. BEVAN: All I can do is to answer the questions here, to call general attention to the facts, and to ask the public to note what is being said here, and not to listen to what certain doctors, who have been acting well below the ethical standards of the profession, have said.

Colonel M. STODDART-SCOTT: Will the Minister assure the House that doctors will not be surcharged for supplying certain drugs as they are at present under the panel system?—Mr. BEVAN: There are regulations concerned with the nature of the drugs to be prescribed. There are certain things prescribed as drugs which are not drugs, champagne, for example.

Dr. L. HADEN GUEST: Is the Minister aware that the British Medical Association take the strongest view of the improper conduct which a few doctors have been following, as suggested in these questions, and that they are taking action to bring this to the attention of the whole profession? Does not the Minister agree that, since the B.M.A. are now coöperating in order to give the best possible service under the slogan of Dr. Dain that "Only the best is good enough," it is desirable that their help in this matter should be welcomed by the Minister?—Mr. BEVAN: I have already welcomed the help that has been given by Dr. Dain, especially in a letter which he wrote recently to the *Times*. I am happy to think that the vast majority of the medical profession frown disapprovingly upon these practices.

Registration of Patients

Miss ALICE BACON asked the Minister under what authority a doctor refused to take a person on his list, and intimated that he was prepared to take the same person as a paying patient.—Mr. BEVAN replied: Such conduct is quite unethical and I confidently expect that the profession will express the strongest disapproval of it. Miss BACON: Is the Minister aware that this is happening, and that these practices give point to the criticism made by some supporters of the Government during the debate on the second reading of the National Health Service Bill, namely, that to allow a doctor in a public service also to undertake private practice is a means of destroying public confidence in the whole scheme?—Mr. BEVAN:

I am hoping that as we gain accumulative experience this practice will disappear. I am sure that it is believed in only by a very small minority of the medical profession, and I believe that as experience develops this alleged dichotomy in that service will be prevented. But, as I have said, such conduct is entirely unethical, and ought to receive the disapproval of the House and the country.

Mr. Wilson Harris: Is there any specific remedy when, as in a case which I know myself, a doctor refuses to take a patient on the grounds that the patient is in a position to pay, and therefore will not be accepted on the general list?—Mr. Bevan: If there are patients who are so informed they can, of course, go to another doctor. If at the end of the process there are patients who are without a doctor they may be assigned to one.

Mrs. Mabel Ridealgh: Is the Minister prepared to take action at a later date in cases where a doctor is prepared to take a husband and wife, but refuses to take the children unless the parents pay private fees for the children?—Mr. Bevan: There have been one or two instances of that kind. I believe that this action is also frowned upon by the medical profession and it only serves to show how necessary it is to organise this profession into a service for the nation as a whole in order to raise its standard of conduct.

Dr. S. Segal: Will not the Minister enlist the active coöperation of these patients in reporting such cases to the proper authority?—Mr. Bevan: They are obviously making their complaints known now, otherwise we would not have heard about them.

Patients Outside Doctor's Area

Mr. G. C. Touche asked the Minister if he was aware that some persons joining the National Health Service had been told that they could not retain the services of the doctor whom they had engaged for several years because they lived outside the area for which the doctor was zoned; and if he would amend the regulations to enable such persons to retain the services of their present medical advisers.—Mr. Bevan replied: A doctor has the right when joining the service to fix the area within which he will visit patients in their homes, as he is required to do when necessary. There is nothing to stop him accepting patients who live outside this area provided he is prepared to visit them.

Decentralisation of Local Health Services

Mr. G. H. Oliver asked the Minister, having regard to the decision of the Derbyshire county council not to delegate any of the duties under part III of the National Health Service Act to the borough of Ilkeston, how many county councils had disregarded his advice in adopting this course; and whether he would effectively intervene in cases where the health services were permitted to fall below the present standard of efficiency.—Mr. Bevan replied: Of 62 county councils in England and Wales, 27 have not decentralised the administration of their health services, but this figure includes some counties in which decentralisation would be inappropriate. I should certainly intervene wherever services of a proper standard were not being provided. Mr. Oliver: Could the Minister be induced to ask the county councils exercising their discretion not to delegate their powers under part III to state their reasons for their action to the smaller authorities whose health service they intend to supersede, particularly when the service is being run efficiently?—Mr. Bevan: The local authorities are acting within their powers and I have no statutory power to interfere. I can only intervene if the standards of the service are not high enough.

Maternity Medical Services

Mr. Somerville Hastings asked the Minister why he had decided to reverse the policy of Statutory Instrument 506 as regards the method of obtaining maternity medical services by encouraging doctors who had had no midwifery experience to undertake maternity work and arranging to pay them for it.—Mr. Bevan: I have decided after consultation with the medical profession to provide a lower fee for maternity medical services undertaken for his own patients by a doctor with ordinary experience. Such a doctor could not otherwise receive any fee for such services, either from public funds or from the patient. This does not affect the higher fees for special experience or the main objective that maternity work should generally be done by practitioners with such special experience. Mr. Hastings: Does this not mean that doctors who have seen no midwifery cases for 20 years or more will be able not only to undertake them but will be paid for them by the nation, and does he not think that this is a public danger and a scandal?—Mr. Bevan: This does not alter the existing situation. A general practitioner can do obstetrical work now and does it, so there is no new scandal being created. What is happening is that a new system is being introduced which will mitigate the present evils and I hope before long entirely remove them. Mr. Hastings: Does not the Minister feel that as he is responsible for the quality of the service he ought to take some steps to see that it is of a sufficient quality?—Mr. Bevan: Steps are being taken. The scheme is to create a panel of general practitioners who will do obstetrical work and relieve other general practitioners without the same experience from doing it. This will in fact powerfully modify and improve the existing practice.

Commander T. D. Galbraith: Can we really give official recognition to what is an undesirable practice?—Mr. Bevan: I cannot quite understand what the hon. Member means. What this means is that a doctor will be paid for obstetrical work if he does that work for his own patient at the request of his own patient. This is, in fact, an attempt to preserve the relationship for which hon. Members opposite have clamoured for two years.

Call-up of Medical Practitioners

Sir Ernest Graham-Little asked the Minister whether he was aware that the recent call-up of young medical practitioners, notwithstanding earlier representations that the supply was more than adequate, had caused hardship to those holding A appointments at the hospitals, who would thus be prevented from proceeding to B2 appointments, with detriment to their professional careers and, in particular, would make it impossible fully to carry out the recommendations of the Goodenough Committee, which declared that house-appointments for one year should be the minimum experience for the young practitioner before commencing practice; and if he would rectify this position.—Mr. Bevan replied: I am fully aware of the implications of the decision referred to. The Medical Priority Committee, on whose advice the decision was taken, recommended it as an exceptional means of meeting an expected deficiency in young practitioners for the Services during the second half of the year. The position will be reviewed towards the end of the year.

Supply of Artificial Limbs

Captain John Crowder asked the Minister of Pensions whether patients applying for artificial limbs under the National Health scheme after July 5 would be supplied with only one type of limb; and whether orders would be placed only with his department's sole contractors.

Sir John Mellor asked the Minister why, under the National Health Service, artificial limbs might be supplied by two firms only, to the exclusion of all other makers; and whether he would enable users to choose any make of limb preferred, provided additional expense does not fall upon public funds.

Mr. George Buchanan replied: This matter is under consideration. I hope shortly to be able to make a statement.

Captain Crowder: Is it the present position that a disabled man who wants his artificial limb repaired will have to pay for it himself unless he goes to one of the Government's sole contractors?—Mr. Buchanan: The present position is that the scheme is not started, so that at present a person other than an ex-Serviceman must pay for it unless he comes under a Ministry of Labour scheme. However, this matter is being considered, and I would like to leave it at that at the moment.

Sir John Mellor: Cannot the Minister give an assurance that users will be permitted to make their own choice provided no additional expense falls on public funds?—Mr. Buchanan: I hope people will be reasonable on this matter. I hope I am not an unreasonable Minister, and I hope that the people I am negotiating with in this matter will bear in mind the general interests of the community. If all of us are reasonable, I am sure we can work it out in a reasonable way.

Mr. Louis Tolley: Will the Minister make a statement at the earliest possible moment? I can assure him that many disabled men are showing real concern at the fact that in all probability in the future they will not be able to go to the makers for repairs and replacements, and they are disturbed as to what their future is likely to be.—Mr. Buchanan: In my view they need not be disturbed at all. I do not want any Party conflict on this, but nobody need be disturbed. The limb we make now is made for the persons who served in H.M. Forces during the war. That has been done for years without any reasonable complaint.

I take it that if those who have this limb are fairly satisfied, it is not a bad limb for other people as well.

Mr. L. D. Gammans asked the Minister why, under the new Health Act, only one firm has been selected to make artificial legs and one other firm to make artificial arms; why the remaining 25 limb-making firms are excluded; and to what extent artificial limbs are being made on semi-mass-production lines.—Mr. Buchanan: The matters referred to in the first part of the question are under review and I hope to make a statement shortly. As regards the last part of the question all artificial limbs supplied by the Ministry of Pensions are fitted to the needs of the individual although as in other productions some parts are made in quantity. Colonel Leonard Ropner: Can the Minister give an assurance that his policy is not to establish anything in the way of a monopoly in the making of artificial limbs? Is he aware that, rightly or wrongly, there is an impression amongst these unfortunate men and women that something is happening behind the scenes which will limit their choice of the manufacturer of the artificial limbs?—Mr. Buchanan: Having talked with the people concerned in this matter, I hope to make a reasonable adjustment. Mr. John Hynd: Will the Minister tell the House when this so-called monopoly was first established?—Mr. Buchanan: This so-called monopoly has been going on all the time. For a long time the main contractor has had the monopoly of supplying limbs to those who suffered as a result of the war.

Mr. Gammans: In view of the fact that the Minister is not able to give an assurance that a monopoly will not be set up in artificial limbs—[Hon. Members: "He said so"]—I beg to give notice that I shall raise this matter on the Adjournment.

Mr. H. D. Hughes asked the Minister whether non-pensionable limbless ex-Servicemen in employment are entitled to receive a duplicate issue of artificial limbs.—Mr. Buchanan: All ex-Servicemen who lost a limb during war service are provided with a duplicate artificial limb. Under the National Health Service duplicate artificial limbs will be provided on the same lines as to the war-disabled.

Tuberculosis Beds in Scotland

Mr. T. F. Hubbard asked the Secretary of State for Scotland the number of pulmonary tuberculosis cases in Scotland for whom hospital treatment was recommended but accommodation was not available?—Mr. Arthur Woodburn replied: There were 2378 cases of pulmonary tuberculosis on the local authorities' waiting-lists for admission to hospital on March 31.

Publications in the Colonial Medical Service

Sir Ernest Graham-Little asked the Secretary of State for the Colonies whether he was aware that his circular 12412/12.2.48, requiring that essays by medical officers in the Colonial Service which it was desired to publish should be first submitted to him to ensure that nothing was published which might misrepresent the policy of the Colonial governments, had caused misgiving amongst medical officers in the service; and if he would recall this instruction?—Mr. Creech Jones replied: No information has reached me that this circular has caused misgiving. The question implies that the effect of this circular was to impose a new general regulation about publications by medical officers in the Colonial Service. In fact, its purpose was to inform Colonial governments of a generous offer by the National Association for the Prevention of Tuberculosis to award a prize of 100 guineas for an essay on the control of tuberculosis in Colonial territories and the reference to the publication of essays was only incidental. One of the rules of the competition says that essays sent in shall become the property of the N.A.P.T. and that any of them may be published at its discretion in the author's name. The circular drew attention to this and said that in order to ensure that nothing is published which might misrepresent the policy of Colonial governments or of H.M. Government, the secretary-general of the association had agreed to arrange that essays which it is desired to publish should first be submitted to the Colonial Office. This conforms generally with Colonial regulation 57, one of whose provisions is that an officer shall not, without the express permission of the Secretary of State or of the governor, publish in any manner anything which may be reasonably regarded as of a political or administrative nature. I think it was right in the interests of all concerned to make this precautionary arrangement and I see no reason why it should be altered. There is no intention whatever of fettering free scientific discussion.

Appointments

Dolton, E. G., M.B. Lond., F.R.C.S.: asst. surgeon (thoracic), Royal Hospital, Wolverhampton.

Jackson, I. M., B.A., M.B. Camb., F.R.C.S., M.R.C.O.G.: surgeon to outpatients, Chelsea Hospital for Women.

Mackenzie, Ian, L.R.C.P.E.: second asst. M.O., The Mental Hospital, Isle of Man.

Parker, W. S., M.B. Manc., D.P.H., D.I.H.: asst. county M.O., Norfolk; M.O.H., Erpingham, Cromer, North Walsham, and Sheringham; and M.O., East Norfolk Joint Isolation Hospital, Roughton.

Parr, T. P., M.D. Edin., D.P.M.: asst. M.O., South-western Regional Hospital Board.

Quilliam, R. L., M.R.C.S., D.P.M., D.M.R.D.: radiologist, St. James Hospital (L.C.C.).

Shield, J. B., M.B. Edin., F.R.C.S.E.: asst. orthopædic surgeon, Royal South Hants and Southampton Hospital.

Townsend, C. Geoffrey, M.B. Camb., D.A.: anæsthetist, Seamen's Hospital, Greenwich.

South-West Metropolitan Regional Hospital Board:

Senior assistant M.O.:

Anderson, P. C., M.D. N.Z., F.R.C.S.E., M.R.C.P.
Revans, John, M.B.E., M.R.C.S., D.C.H.

County Borough of West Ham:

Florentin, Miriam, M.B. Manc., D.P.H.: senior asst. M.O., maternity and child welfare.

Wigley, G. S., M.R.C.S., D.P.H.: deputy M.O.H. and deputy school M.O.

Colonial Service:

Bennett, J. P., M.B. Durh.: travelling M.O., Sarawak.
Davies, J. G., M.B. Edin., D.T.M. & H.: M.O., Malaya.
Dean, N. M. B., M.B. Edin.: M.O., Nigeria.
Fung-Kee-Fung, C. O., M.B. Lond., F.R.C.S.: asst. surgeon, Public Hospital, Georgetown, British Guiana.
Herlinger, Hans, M.D. Malta: M.O., British Guiana.
Lester, H. M. O., O.B.E., PH.D., B.SC. Lond., M.R.C.S., D.T.M. & H.: director of tsetse and trypanosomiasis research and reclamation, East Africa.
O'Malley, O. M., M.B. Dubl.: M.O., Malaya.
O'Neill, P. L., F.R.C.S.E., D.L.O.: M.O., grade A, surgeon, Trinidad.
O'Shaughnessy, J. D., M.B. Dubl.: M.O., Malaya.
Patton, G. Q., M.R.C.S., D.T.M. & H.: M.O., Northern Rhodesia.
Ramsay, Robert, M.B. Glasg.: asst. director of medical services, Gold Coast.
Saunders, G. F. T., M.D. Dubl.: specialist, Gold Coast.
Slessor, R. S., M.B. Aberd.: senior M.O., Falkland Islands.
Watt, Anne, M.B. Glasg.: lady M.O., Malaya.

Births, Marriages, and Deaths

BIRTHS

Adams.—On June 16, in Belfast, the wife of Dr. G. F. Adams—a daughter.

Belsey.—On June 15, at Bristol, the wife of Mr. Ronald Belsey, F.R.C.S.—a daughter.

Bird.—On June 25, at Reading, the wife of Dr. J. G. Bird—a daughter.

Dawes.—On June 20, at Headington, Oxford, the wife of Dr. Geoffrey Dawes—a son.

Dunn.—On June 24, at Salisbury, the wife of Dr. G. N. Dunn—a son.

Horsnell.—On June 19, at Watford, the wife of Dr. Maxwell Horsnell—a daughter.

Knowles.—On June 20, at Epsom, the wife of Dr. Colin Knowles—a daughter.

Lawless.—On June 18, in London, the wife of Dr. D. J. Lawless, O.B.E.—a daughter.

Macmillan.—On June 21, in Toronto, Canada, the wife of Dr. R. L. Macmillan—a son.

Maisey.—On June 22, in London, the wife of Major C. W. Maisey, R.A.M.C.—a son.

Martin.—On June 16, in London, the wife of Dr. T. D. M. Martin—a daughter.

Mayer.—On June 18, the wife of Mr. J. H. Mayer, F.R.C.S.—a son.

Miller.—On June 22, at Rugby, the wife of Dr. Peter Miller—a daughter.

Parsons.—On June 25, at Weymouth, the wife of Dr. G. Parsons—a son.

Shorvon.—On June 17, in London, the wife of Dr. H. J. Shorvon—a son.

Waller.—On June 19, at Harrow, the wife of Dr. H. Noel Waller—a daughter.

Wood.—On June 21, at Ealing, the wife of Dr. E. J. Wood—a son.

MARRIAGES

Barnard—van der Haas.—On June 22, at Rotterdam, Harold Faraday Barnard, M.B., to Floor van der Haas.

Groves—Kemball.—On June 11, in London, John Nixon Groves, D.S.O., M.B., to Anne Leslie Kemball.

DEATHS

Barlee.—On June 25, at Guildford, Hobart John William Barlee, M.D. Lyons, aged 79.

Morris.—On June 11, killed at Sedjera, Upper Galilee, Israel, Isaiah Morris, M.C., M.R.C.S., D.C.H., aged 30.

Stephenson.—On June 16, at Monkstown, County Dublin, Edward Francis Stephenson, F.R.C.S.I., F.R.C.P.I., D.P.H.

Thomas.—On June 16, Leonard Kirkby Thomas, M.R.C.S., aged 76

Thorpe.—On June 23, in London, Vidal Gunson Thorpe, O.B.E., M.R.C.S., surgeon rear-admiral, R.N., aged 84.

Wigg.—On June 22, James Wigg, L.R.C.P., aged 88.

Windsor.—On June 22, at Royston, Herts, Charles William Windsor, M.A., M.D. Camb.

Notes and News

R.A.M.C. JUBILEE

To mark the 50th anniversary of the foundation, in 1898, of the Royal Army Medical Corps, the R.A.M.C. Association has compiled a jubilee scrapbook,[1] the profits from which are to be devoted to the Corps' War Memorial Fund. Carefully conceived and amply illustrated, this little book gives vivid glimpses of the Corps at work and at play, in peace and in war. For the buyer as well as the fund the half-crown surrendered for a copy will be money well spent.

SUPPLEMENTARY OPHTHALMIC SERVICES

In the light of the report of the Spens Committee on the remuneration of consultants and specialists, the fee for the testing of sight in the Supplementary Ophthalmic Service by medical practitioners having the prescribed qualifications will be £1 11s. 6d. a case, on the understanding that the practitioner will be responsible for providing all necessary premises and equipment.

A JUBILEE

Medical-school journals are nearly always good reading, and occasionally they are something more. The *Gazette* of Manchester University Medical School, which has just achieved its 50th anniversary, is a particularly handsome and well-served journal, printed well on plenty of good paper and carrying well-illustrated and informative clinical articles, historical essays, reports of meetings, and book reviews, as well as the usual quota of obituaries, light verse, howlers, and professorial witticisms. In the jubilee number, with its gilded cover, Dr. E. Bosdin Leech recalls the long roll of editors, the changes of cover design, and the brilliant illustrators—including Henry Lamb—who have from time to time adorned its pages, while Mr. W. J. Metcalfe writes of the lively and informal meetings of the Owens College Medical Students' Debating Society, where smoking was allowed, and subjects ranged from nurses (treated seriously) to ghosts, hypnotism, infant mortality, the reform of the stage, the effect of dress on morals, mendelian inheritance, and the benefits of alcoholism and disease on the race. An article on hand infections, written by Mr. Harold Bolton, F.R.C.S., and Mr. R. P. Jepson, F.R.C.S., and beautifully illustrated by photographs, gives this jubilee number special distinction.

PROFESSIONAL AID

The child who makes a bad start in a subject—often because he was ill during the first term it was taught, or because he was grounded by a poor teacher—never catches up unless he is given a little individual help. Problems mount with every fresh lesson, and his ability to overcome his difficulties wanes even as they pile up on him. This is also the fate of some able people who, often through no fault of their own, get into financial difficulties. Timely help, sometimes even quite a small amount of help, would put them on their feet; but with no-one to turn to they are overwhelmed. It is to relieve such people that the Professional Classes Aid Council[2] was founded. Composed of representatives of almost all the great professional bodies, it works in close association with their funds and institutions; but many of these funds are restricted to certain groups, and some professional people are excluded from them. The council gives special help to such cases, and also to other suitable non-professional people. Immediate help is given when necessary but the council's main task is to set professional men and women on their feet and see them through their difficulties. The annual report for 1947–48 shows how effective such aid can be. Generous help is given with the education and training of young people: during the year grants were made to 106 children. As an example, a boy of 17 whose parents had both broken down in health was helped through the last year of school, and has now won a scholarship which will cover his training as a doctor for the next five years. Annual grants are made to some old people, and the income of a special fund is kept for this purpose. In all £12,817 was spent last year in relief.

VOLUNTARY HELP FOR HOSPITALS

In its memorandum "Personal Support for Hospitals in the National Health Service" the British Hospitals Association suggested that after July 5 there will be undiminished opportunity for voluntary services and personal interest and support. In a further memorandum[1] the association urges the establishment of a league of friends for each local hospital or group of hospitals: such a league, it is believed, would make a suitable assembly point for voluntary workers.

FOOD FOR THE CONVALESCENT

One of the chief pleasures of the convalescent is in eating. Like the traveller on a long sea voyage he has little to entertain him except meal times, and if he is to gain weight and vigour quickly he should not be disappointed. A new *Memorandum on Catering for Convalescent Homes*,[2] published by King Edward's Hospital Fund for London, gives some first-class advice on catering, staffing, equipment, service, the planning of dining-rooms, and prevention of waste, and carries a section of menus and recipes. The material is largely drawn from the memoranda on hospital diet published by the fund in 1943 and 1945, but is more brief and concise, and it will be welcome to the busiest matron in charge of the feeding of convalescents.

OPTION IN SUPERANNUATION SCHEME

A leaflet (S.D.D.), obtainable from executive councils, gives details of the choice open to doctors and dentists in the new service who already hold insurance policies providing for themselves on retirement or for their wives and dependants on death. Those with cover broadly equivalent to that of the National Health Service superannuation scheme may remain outside the scheme and receive instead an amount equal to 8% of their net remuneration (i.e., their gross remuneration for general medical or dental service, less a percentage for practice expenses) towards the premiums. The condition is that the premiums on endowment or deferred annuity policies maturing at the age of 60 or later must amount to at least £150 per annum. Where the annual premiums are between £50 and £150 the practitioner will be given an opportunity of taking out additional policies to bring them up to £150.

Doctors wishing to exercise the option must apply in writing to their executive council before Oct. 4.

University of London

Dr. R. S. Stacey has been appointed to the university readership in therapeutics at St. Thomas's Hospital medical school.

Dr. Stacey, who is a graduate of Cambridge University, qualified from St. Thomas's in 1930, and two years later he became first assistant to the professor of medicine. In 1935 he took up his present appointments as professor of pharmacology and therapeutics in the Royal Faculty of Medicine of Iraq, and physician to the Royal Hospital, Bagdad.

University of Bristol

At recent examinations the following were successful:

M.D.—G. H. Wakley.

M.B., Ch.B.—Barbara Brosnan, Suzanne K. R. Clarke, R. S. G. Davies, C. C. Downie, M. J. Dunn, Molly I. Govier, Pamela I. Hannaford, A. H. Levy, Jenny Pym, F. A. A. Rugget, B. F. Vaughan, George Winternitz, R. H. Wood; and in group II (completing examination) Elizabeth H. Chard.

D.R. (Part II).—A. A. G. Flemming, F. A. Hanna.

D.P.H. (Part II).—R. G. Brennan, J. B. M. Davies, D. M. M. Jones, E. W. Moore, William Nicol.

D.P.M. (Part II).—W. L. Jones, Ronald Magee, J. R. Stuart.

Lady Tata Memorial Trust

The trustees of the fund have made the following awards for research in blood diseases, with special reference to leukæmia, in the year beginning Oct. 1, 1948:

Grants for research expenses and assistance:

- Dr. Marcel C. Bessis (France).
- Dr. Jørgen Bichel (Denmark).
- Dr. Pierre Cazal (France).
- Dr. Johannes Clemmesen (Denmark).
- Dr. P. A. Gorer (Great Britain).
- Dr. Andrew Kelemen (Hungary).
- Dr. Edith Paterson (Great Britain).
- Prof. Edoardo Storti (Italy).

Scholarships (for whole-time or part-time research):

- Dr. Simon Iversen (Denmark).
- Dr. C. F. M. Plum (Denmark).
- Dr. G. H. R. Tötterman (Finland).

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1. Jubilee Scrapbook of the Royal Army Medical Corps: 1898–1948. Compiled by the R.A.M.C. Association. Pp. 41. Obtainable, 2s. 9d., post free, from Messrs. Gale and Polden Ltd., Wellington Press, Aldershot.
2. Annual Report, 1947–48. Obtainable from the secretary of the council, 20, Campden Hill Square, London, W.8.

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1. Local Organisations and Funds in Aid of a Particular Hospital or Group of Hospitals. Memorandum published by the British Hospitals Association, 39, Green Street, London, W.1.
2. Obtainable from Geo. Barker & Son, Furnival Street, London, E.C.4. Pp. 32. 6d.

Royal Institute of Public Health and Hygiene

Sir Lionel Whitby will deliver the Harben lectures for 1948 at the institute, 28, Portland Place, London, W.1, at 3 P.M. on Dec. 7, 8, and 9. He has chosen as his subject Hæmopoiesis.

Royal Faculty of Physicians and Surgeons of Glasgow

At a recent examination for the diploma in industrial health of the faculty the following were successful:

Roy McL. Archibald, J. H. Bell, J. H. Chambers, J. L. Fyfe, Duncan Livingstone, Edward Livingstone, Duncan MacInnes, D. A. MacLean.

British Standards Institution

The annual general meeting of the institution will be held on Wednesday, July 21, at 3 P.M. at the Institution of Electrical Engineers, Savoy Place, London, W.C.2.

International Scientific Film Congress

The second congress of the International Scientific Film Association will be held in London from Oct. 4 to 11. Further details may be had from the Scientific Film Association, 34, Soho Square, London, W.1.

Factors Concerned in Vision, Light, and Seeing

Mr. Matthew Luckiesh, director of the lighting research laboratory, General Electric Company, Cleveland, U.S.A., will speak on the above subject at the London School of Hygiene, Keppel Street, W.C.1, on Wednesday, July 14, at 2 P.M.

Meeting of Child Psychiatrists

The child psychiatry section of the Royal Medico-Psychological Association are holding a meeting at 1, Wimpole Street, London, W.1, on Friday, July 9, at 4.15 P.M., when a paper will be read and a film shown on Grief—a Peril in Infancy. Members of the British Pædiatric Association and the Section of Pædiatrics of the Royal Society of Medicine are invited to attend.

London County Council

Major-General J. P. Helliwell, consulting dental surgeon in the public-health department, has retired owing to ill health. The first to hold this post under the council, he was also the first chief of the Army Dental Corps. He was a member of the Teviot Committee on dentistry which reported in 1946.

Dr. Dorothy Egan, an assistant medical officer in the public-health department, has been promoted to be a divisional medical officer.

Ross Jubilee Exhibition

To mark the 50th anniversary of the discovery of the transmission of malaria by mosquitoes, finally completed by Ronald Ross on July 9, 1898, an exhibit has been prepared showing the history of developments in malaria control, and examples of the present stage of malaria control in many parts of the world. The exhibit will be open to the public at the London School of Hygiene, Keppel Street, W.C., from 11 A.M. to 4 P.M. from July 6 to 9.

British Delegation to World Health Assembly

Sir Wilson Jameson, chief medical officer of the Ministry of Health, headed the United Kingdom delegation to the first World Health Assembly when it opened in Geneva on June 24. His place as chief delegate is now being taken by Dr. Melville Mackenzie, also of the Ministry. Other delegates include Dr. Wilson Rae (Colonial Office) and, for part of the time, Dr. P. G. Stock and Dr. R. H. Barrett (Ministry of Health), Mr. George North, LL.D. (Registrar-General), and Dr. Percy Stocks (General Register Office).

Refresher Courses in Tuberculosis

On behalf of the Tuberculosis Educational Institute, the National Association for the Prevention of Tuberculosis will hold the following courses during 1948: Radiology in Connexion with Tuberculosis and Chest Diseases, at Leeds University, Sept. 20–22; Treatment of Non-pulmonary Tuberculosis including Lupus, at Lord Mayor Treloar Cripples' Hospital, Alton, Hants, Oct. 5–7; clinical courses, at the Cheshire Joint Sanatorium, Market Drayton, Salop, Oct. 26–28, Nov. 23–25, and Dec. 7–9. Further particulars may be had from the secretary of the N.A.P.T., Tavistock House North, London, W.C.1.

King's College Hospital

A memorial lecture has been founded in memory of Thomas Percy Legg, surgeon to the hospital from 1910 to 1930. A scholarship in cardiology has also been endowed to commemorate Harold Waterlow Wiltshire, physician to the hospital from 1910 to 1925.

Speech Therapy Conference

The College of Speech Therapists is holding an international conference at 1, Wimpole Street, London, W.1, from Sept. 20 to 24. The speakers will include Dr. Leopold Stein (Vienna), Dr. Macdonald Critchley, and Dr. Mildred Creak, and there will be discussions on the Emotional Background of Disorders of Speech, and Speech Disorders Arising from Head Injuries. Further information may be had from the conference secretary, 68, Queen's Gardens, W.2.

International Refugee Organisation

The medical staff of the preparatory commission (PCIRO) is as follows:

HEADQUARTERS, GENEVA

Director of health: Dr. R. L. Coigny (Paris).
Medical consultant: Dr. H. Kennedy (Belfast).
Medical consultant: Dr. J. B. Petrie (Aberdeen).
Chief nurse: Miss S. J. Haines (Australia).
Chief nutritionist: Miss C. Hill (U.S.A.).

CHIEF MEDICAL OFFICERS

Germany (U.S. Zone): Dr. L. Findlay (Aberdeen).
Germany (British Zone): Dr. R. F. Walker (Belfast).
Germany (French Zone): Dr. R. E. Dax (Paris).
Austria: Dr. E. S. Meyers (Australia).
Italy: Dr. C. T. Jones.

Lieut.-Colonel Joseph Caplan, R.A.M.C., has been awarded the Order of El Maaref (Third Grade) by the King of Egypt for his services in connexion with the suppression of malaria.

Diary of the Week

JULY 4 TO 10

Monday, 5th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. R. Weedon Butler: Acute Hæmatogenous Osteomyelitis.
6.15 P.M. Mr. A. D. Marston: History of Anæsthesia.
WESTMINSTER HOSPITAL, Horseferry Road, S.W.1
5.30 P.M. (Meyerstein theatre.) *Clinico-pathological demonstration on Subacute Bacterial Endocarditis.*
WEST LONDON MEDICO-CHIRURGICAL SOCIETY
7.45 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Debate that Capital Punishment is Bad Prophylaxis.

Tuesday, 6th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. John Charnley: Fractures of the Forearm Bones.
6.15 P.M. Dr. John Gillies: Anæsthetics for Operations on Cardiovascular Conditions.

Wednesday, 7th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. G. R. Girdlestone: Pott's Disease and Pott's Paraplegia.
6.15 P.M. Dr. A. C. Forrester: Anæsthesia for the Outpatient.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
10.15 A.M. (1, Wimpole Street, W.1.) Annual meeting.
11 A.M. Dr. W. Rees Thomas: Presidential address.
2.30 P.M. (11, Chandos Street, W.1.) Dr. J. B. S. Lewis, Dr. W. J. T. Kimber, Miss R. S. Addison: Training and Scope of Psychiatric Social Workers in Relation to Adults.

Thursday, 8th

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. Richard B. Cattell (Lahey Clinic): Carcinoma of the Pancreas. (Surgery lecture.)
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
8 P.M. (11, Chandos Street, W.1.) Dr. J. Carse, Dr. T. J. Hennelly: Planning a Psychiatric Inpatient Service.

Friday, 9th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. K. I. Nissen: Non-tuberculous Affections of the Hip-joint in Childhood and Adolescence.
6.15 P.M. Dr. Geoffrey Organe: Assessment of Anæsthetic Risk.
GUY'S HOSPITAL, S.E.1
5 P.M. Dr. E. B. Astwood (Harvard): Medical Treatment of Hyperthyroidism. (Addison lecture.)
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
10.30 P.M. (11, Chandos Street, W.1.) Dr. W. McCartan, Dr. J. Ferguson, Dr. K. C. Bailey: Relation of the Mental Hospital to the Community.

GAMMA-GLOBULIN IN THE PREVENTION AND ATTENUATION OF MEASLES

REPORT OF A SUBCOMMITTEE * TO THE BLOOD TRANSFUSION RESEARCH COMMITTEE OF THE MEDICAL RESEARCH COUNCIL

In July, 1943, a litre of normal human serum gamma-globulin antibodies, prepared according to the technique elaborated by Dr. E. J. Cohn at Harvard, was placed at the disposal of the Director of Biological Standards at the National Institute for Medical Research, Hampstead, through the generosity of Dr. Cohn and the American Committee for Medical Research. At that time this material, which had hitherto been produced only at the pilot plant at Harvard, was beginning to be prepared on a large scale for issue to the American armed forces, but the elaborate low-temperature plant required and the large amount of alcohol used in the process made it impracticable to produce gamma-globulin in the United Kingdom during the war. The production of large quantities in the United States was possible because the raw material was a by-product of the manufacture of serum-albumin which was used extensively for transfusion in the Services.

Through the courtesy of our American colleagues we were sent the progress reports,[1] and it was evident from the early trials in the U.S.A. that Cohn's fraction II was a remarkably effective measles prophylactic. (At that time electrophoretic analysis showed fraction II to contain 87% of gamma-globulin, and by a later improvement in preparation this figure was raised to 98%.) Accurate dosage scales had not yet been worked out, but it was apparent that the effective dose was considerably smaller than that of any other known measles prophylactic. Moreover, encouraging results were recorded in the treatment of measles in the early stages, and it was stated that cases in which gamma-globulin had been given at the stage of development of Koplik's spots had developed no rash.

Under the ægis of the Blood Transfusion Research Committee of the Medical Research Council a subcommittee was formed to decide how best to use the sample of American gamma-globulin. Experience with other measles prophylactics had shown that the results were influenced by the age of the patient, the degree and duration of exposure to infection, the duration of the exposure-injection interval, the dose, and the stage of the epidemic in which the material was injected. It was decided to try to assess the value of the new prophylactic in comparison with other preparations whose value in this country was already known, and to this end an experiment was planned in which the whole sample was used in comparative tests with convalescent measles serum. Tests were carried out by members of the committee on children in their homes, in hospitals, and in residential nurseries. In this first inquiry no adjustment of dosage was made for age or body-weight, and the quantities injected for prevention and attenuation were reduced as far as possible in the hope that significant results would be obtained. The results of this experiment are given in part I of this report.

In the summer of 1944 so little measles was occurring in the U.S.A. that difficulty was being experienced by American workers in testing new batches of gamma-globulin produced by commercial firms, and an appeal was made to our committee for assistance in this work. As a result a consignment of 2390 ml. was received from America for testing, this consisting of samples of 15

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* Sir Percival Hartley, F.R.S. (chairman)
Dr. Thomas Anderson
Dr. N. D. Begg
Dr William Gunn
Dr. Robert Cruickshank
Dr. W. J. Martin
Dr. Ian Taylor (secretary).

[1] Since published in the form of a symposium. *J. clin. Invest.* 1944, 23, 417.

TABLE I—RESULTS WITH GAMMA-GLOBULIN

Age	Dose 1·2 ml. or less				Dose 1·5–2·0 ml.				Dose 2·5 ml. or more				All doses			
	No. of children	Measles			No. of children	Measles			No. of children	Measles			No. of children	Measles		
		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil
Hospital contacts:																
0–6 months ..	2	..	..	2	8	..	..	8	..	..	..	..	10	..	..	10
6–12 months ..	8	..	1	7	7	..	..	7	2	..	..	2	17	..	1	16
1–4 years ..	18	..	9	9	23	1	1	21	26	..	1	25	67	1	11	55
5–9 years ..	..	..	..	..	6	1	..	5	1	..	..	1	7	1	..	6
10 + years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	28	..	10	18	44	2	1	41	29	..	1	28	101	2	12	87
Home contacts:																
0–6 months ..	1	..	..	1	2	..	..	2	..	..	..	..	3	..	..	3
6–12 months ..	..	..	..	..	2	..	..	2	..	..	..	..	2	..	..	2
1–4 years ..	5	1	..	4	4	..	2	2	2	..	1	1	11	1	3	7
5–9 years ..	1	..	1	..	1	..	..	1	..	..	..	..	2	..	1	1
10 + years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	7	1	1	5	9	..	2	7	2	..	1	1	18	1	4	13
Schools and nurseries:																
0–6 months ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6–12 months ..	2	2	..	..	..	..	..	..	..	..	..	..	2	2	..	..
1–4 years ..	5	3	..	2	..	..	..	..	..	..	..	..	5	3	..	2
5–9 years ..	..	..	..	..	..	..	..	..	5	..	..	5	5	..	..	5
10 + years ..	..	..	..	..	..	..	..	..	8	..	..	8	8	..	..	8
Total ..	7	5	..	2	..	..	..	..	13	..	..	13	20	5	..	15
Grand total ..	42	6	11	25	53	2	3	48	44	..	2	42	139	8	16	115

TABLE III—PERCENTAGE PROTECTED; AND PERCENTAGE PROTECTED OR ATTENUATED

Age	No. of children	Protected	Protected or attenuated
Convalescent serum:			
0–6 months ..	10	10 *(100%)*	10 *(100%)*
6–12 months ..	21	17 *(81·0%)*	21 *(100%)*
1–4 years ..	83	50 *(60·2%)*	74 *(89·2%)*
5–9 years ..	16	13 *(81·3%)*	13 *(81·3%)*
10 + years ..	6	6 *(100%)*	6 *(100%)*
Total ..	136	96 *(70·6%)*	124 *(91·2%)*
Gamma-globulin:			
0–6 months ..	13	13 *(100%)*	13 *(100%)*
6–12 months ..	21	18 *(85·7%)*	19 *(90·5%)*
1–4 years ..	83	64 *(77·1%)*	78 *(94·0%)*
5–9 years ..	14	12 *(85 7%)*	13 *(92·9%)*
10 + years ..	8	8 *(100%)*	8 *(100%)*
Total ..	139	115 *(82·7%)*	131 *(94·2%)*

batches prepared by five different commercial firms. Since this shipment of gamma-globulin had been given o the committee for the specific purpose of testing each batch for the presence of measles antibodies, an entirely different method of working from that used in the previous experiments had to be adopted. Moreover, it was found advisable at this stage to adopt a dosage imilar to that which was then in use in America and to adjust the quantity injected to the patient's body-weight. An interim report on these batches of gamma-globulin, ogether with the relevant record cards, was submitted o our American colleagues in November, 1945. The ests showed that one batch was deficient in protective antibodies, but that the remainder were satisfactory n this respect. A summary of the results obtained in hese trials forms part II of this report.

In July, 1946, Dr. C. A. Janeway, who was closely associated with Dr. Cohn in the early work on gamma-lobulin, sent to this country a further 2500 ml. of this prophylactic. The expiry date of this material was May, 1946, which showed that it had been prepared in May, 1945. Studies were being carried out in America on similar outdated material, and a request was made that collateral studies should be made in Britain to determine whether, as earlier trials had suggested, the material retained its potency considerably longer than the period indicated by the official expiry date. Experience with this outdated material forms part III of this report.

The committee kept the various trials under fairly close personal supervision, though the tests were done in a number of different environments. Some of the tests were made in Glasgow and district and the rest in the London area. Many observations were made in home contacts when there was evidence of exposure of susceptible children to a definite case of measles; others were made in fever hospitals when cases of measles occurred in wards containing children with other infectious diseases, in residential schools, and in residential nurseries.

Attention was focused on the necessity for including in the survey only children who had not had measles in the past and were now exposed to an undoubted case. It was realised that no significant results could be obtained if the exposure-injection interval was more than five or six days, and this fact was kept in mind in the selection of measles outbreaks for inclusion in the trials.

Another factor that had to be considered was the temporary nature of the immunity resulting from serum or globulin injections. A child may be protected by serum from one exposure but may contract measles from a later exposure. The period of observation was therefore limited to the first three weeks after injection. In one outbreak in a preparatory school, included in this report, convalescent measles serum or gamma-globulin was given to 24 contacts within two days of

TABLE II—RESULTS WITH CONVALESCENT SERUM

Age	Dose 2·5 ml.				Dose 3·3 and 3·5 ml.				Dose 5 ml. or more				All doses			
	No. of children	Measles			No. of children	Measles			No. of children	Measles			No. of children	Measles		
		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil
Hospital contacts:																
0–6 months ..	2	..	..	2	6	..	..	6	1	..	..	1	9	..	..	9
6–12 months ..	6	..	4	2	8	..	..	8	3	..	..	3	17	..	4	13
1–4 years ..	16	..	11	5	20	5	1	14	27	..	5	22	63	5	17	41
5–9 years ..	..	..	..	..	3	1	..	2	3	..	..	3	6	1	..	5
10 + years ..	..	..	..	..	2	..	..	2	..	..	..	..	2	..	..	2
Total ..	24	..	15	9	39	6	1	32	34	..	5	29	97	6	21	70
Home contacts:																
0–6 months ..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	..	1
6–12 months ..	..	..	..	..	3	..	..	3	..	..	..	..	3	..	..	3
1–4 years ..	..	..	..	..	7	..	5	2	6	..	2	4	13	..	7	6
5–9 years ..	..	..	..	..	4	2	..	2	..	..	..	..	4	2	..	2
10 + years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	14	2	5	7	7	..	2	5	21	2	7	12
Schools and nurseries:																
0–6 months ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6–12 months ..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	..	1
1–4 years ..	..	..	..	..	6	4	..	2	1	..	..	1	7	4	..	3
5–9 years ..	..	..	..	..	..	..	..	..	6	..	..	6	6	..	..	6
10 + years ..	..	..	..	..	..	..	..	..	4	..	..	4	4	..	..	4
Total ..	..	..	..	..	7	4	..	3	11	..	..	11	18	4	..	14
Grand total ..	24	..	15	9	60	12	6	42	52	..	7	45	136	12	28	96

TABLE V—BATCH TESTING OF GAMMA-GLOBULIN, OMITTING BATCH D2

Aim : prevention

Age	Hospital contacts				Home contacts				School and nursery contacts				All contacts			
	No. of children	Measles			No. of children	Measles			No. of children	Measles			No. of children	Measles		
		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil
0–6 months ..	1	..	..	1	2	..	..	2	..	..	..	..	3	..	..	3
6–12 months ..	2	..	..	2	9	..	..	9	4	..	..	4	15	..	..	15
1–4 years	27	..	4	23	25	1	..	24	14	..	2	12	67*	1	6	60
5–9 years	6	..	..	6	2	..	..	2	..	..	..	..	8	..	..	8
10 + years ..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	..	1
Not stated ..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	..	1
Total ..	36	..	4	32	39	1	..	38	19	..	2	17	95	1	6	88

* Includes 1 whose place of contact was not given.

first exposure. None of these boys developed measles during the next three weeks, and the results have therefore been recorded as successful. Later, however, 22 of the boys developed measles 26–49 days after injection, some of them having unmodified attacks.

The injections were given intramuscularly and no untoward results were noted.

PART I: COMPARATIVE TESTS OF THE POTENCY OF GAMMA-GLOBULIN AND CONVALESCENT SERUM

This part of the inquiry had the limited objective of comparing the value of the American gamma-globulin with that of measles prophylactics already in common use in Great Britain. Convalescent measles serum was chosen for the comparative tests as being the most reliable of the existing prophylactics, and a single batch of dried convalescent serum was reconstituted and used as the control material.

The American protocols suggested that, if gamma-globulin was given in full dosage, a very high degree of protection could be expected. Full protection of the experimental herd with gamma-globulin would not have furthered the purpose of the trial. It might have shown that gamma-globulin was a powerful prophylactic and perhaps that it was better than convalescent measles serum, but it would not have shown how much better one prophylactic was than the other. It was therefore decided that wherever possible the dosage of both prophylactics should be reduced to the level at which success or failure hung in the balance. It was left to the medical officer carrying out the trial to decide when this could be done with safety. It was agreed generally that no adjustment of dosage was to be made at this stage for age or body-weight, but that the aim should be to use the following doses when possible :

For attenuation :	Convalescent measles serum ..	2·5 ml.
	Gamma-globulin	1·2–1·5 ml.
For protection :	Convalescent measles serum ..	5·0 ml.
	Gamma-globulin	3·5 ml.

It was impossible to adhere to this dosage scheme throughout, but it was adopted in the large majority of cases. Tables I and II show the doses used and the numbers of children at each age in hospitals, schools, and nurseries, and the patients' homes.

To eliminate as far as possible the effect of differing degrees of exposure and of different time and place, trials were limited to instances in which at least 2 susceptible contacts had been exposed to the same infection for the same period, and convalescent serum and gamma-globulin were each given to an equal number of contacts. The serum and globulin groups in each test contained roughly the same number of children of each age-group ; 136 contacts were given convalescent measles serum and 139 received gamma-globulin.

Results.—It should be remembered that the aim of this test was neither protection nor attenuation but comparison of the two prophylactics. The numbers are small, and percentage figures based thereon must be accepted with reserve, but the comprehensive percentage results shown in table III are instructive. For all doses taken together there is a significant difference between the percentage protected by gamma-globulin (82·7) and by convalescent serum (70·6).

TABLE IV—RESULTS WITH DIFFERENT BATCHES OF GAMMA-GLOBULIN

Aim : prevention

Maker	No. of children	Average measles	Mild measles	No measles
A	6	..	..	6
B1	2	..	..	2
B2	6	..	..	6
B3	11	..	..	11
C1	2	..	..	2
C2	2	..	..	2
C3	9	..	..	9
C4	1	..	1	..
C5	5	..	..	5
C6	15	..	3	12
D1	21	1	1	19
D2	28	2	10	16
E1	6	..	..	6
E2	9	..	1	8
Total	123	3	16	104

Perhaps the most instructive group of cases was that in which the smallest doses were used. From tables I and II it is seen, from the high proportion of cases in which attenuation as opposed to protection was attained with the smallest doses, that the doses used on these children (almost all of whom were under 5 years of age) were somewhere near the minimal protecting dose. At this age we can therefore regard a dose of 2·5 ml. of convalescent measles serum as roughly equivalent to a dose of less than 1·2 ml. of gamma-globulin.

Thus the general conclusion from this trial is that the gamma-globulin used was rather more than twice as potent as the sample of convalescent measles serum.

PART II: TRIALS OF GAMMA-GLOBULIN FROM DIFFERENT MANUFACTURERS

When the request was received from American workers to help them in carrying out trials of commercial gamma-

TABLE VI—RESULTS WITH OUTDATED GAMMA-GLOBULIN

Age	Home contacts				School and nursery contacts				Hospital contacts				All children			
	No. of children	Measles			No. of children	Measles			No. of children	Measles			No. of children	Measles		
		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil		Av.	Mild	Nil
Aim: prevention:																
0–6 months ..	3	..	..	3	1	..	..	1	5	..	2	3	9	..	2	7
6–12 months ..	5	..	1	4	8	..	..	8	13	..	..	13	26	..	1	25
1–4 years ..	30	..	5	25	37	..	3	34	43	1	13	29	110	1	21	88
5–9 years ..	2	..	1	1	1	..	..	1	8	..	3	5	11	..	4	7
10 + years ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	40	..	7	33	47	..	3	44	69	1	18	50	156	1	28 (18%)	127(81%)
Aim: attenuation:																
0–6 months ..	13	..	..	13	..	..	..	..	..	..	..	..	13	..	..	13
6–12 months ..	9	..	2	7	..	..	..	..	..	..	..	..	9	..	2	7
1–4 years ..	62	2	29	31	3	..	..	3	1	..	..	1	66	2	29	35
5–9 years ..	11	..	8	3	1	..	1	..	1	..	..	1	13	..	9	4
10 + years ..	..	..	..	..	1	..	1	..	..	..	..	..	1	..	1	..
Total ..	95	2	39	54	5	..	2	3	2	..	..	2	102	2	41 (40%)	59 (58%)

globulin the tests described in part I of this report had been completed, and the standard of performance to be expected in this country from Cohn's fraction-II was known. Since our American colleagues had decided to abandon the "flat dose" in favour of a dose adjusted to body-weight, and since it was necessary for the British trials to conform as far as possible to those in progress in America, the new dosage was adopted in our trials. The dose recommended for prevention was 0·1 ml. per lb. body-weight, given intramuscularly as soon as possible after first exposure to infection.

In table IV the results are tabulated according to the batch and manufacturer. The results from D2 fell well below the standard attained by all the others. Table V shows the results obtained in the different environmental communities studied, omitting the defective batch D2. Table IV shows that the over-all rate of success in the prevention of measles was 84·5%, and when the defective batch D2 was omitted the figure was 92·6%. When the defective batch is omitted, either prevention or attenuation was obtained in 94 out of 95 injected contacts (table V).

A portion of the supply of gamma-globulin used in this part of the trials was unused at the end of the measles epidemic. This was used in the same dosage in the following year, by which time it had passed its expiry date. It was given to 36 children, with the object of prevention, with complete success in all cases. An attempt to attenuate measles in 7 other children led to the protection of 5 and the development of a modified attack in 2.

PART III: USE OF OUTDATED GAMMA-GLOBULIN IN PREVENTION AND ATTENUATION

Apart from their scientific interest the results of this part of the inquiry are of considerable administrative importance. If any measles prophylactic is to be used on a large scale, very large quantities must be available for issue when an epidemic begins. The extent of a measles epidemic cannot be forecast with accuracy, and the demand for prophylactics is even more difficult to estimate. It is of some importance to know if stocks that are not used during an epidemic can be safely used in the following year. This report goes some way to answer this question.

This aspect of the subject has already been mentioned in part II, where it was shown that outdated material from different batches was still active.

The gamma-globulin used in this part of the inquiry, which was for the most part given in the winter of 1946–47, had been prepared in May, 1945, and bore an expiry date of May, 1946. The dosage adopted was similar to that in part II. The results, summarised in table VI, show that, when attenuation was the aim, the result was 40% attenuated and 58% protected—a total of 98% either protected or attenuated. When protection was the aim, the result was 81% protected and 18% attenuated—a total of 99% either protected or attenuated.

That the attempt at protection was successful in only 81% of cases may well be explained by some deterioration of the gamma-globulin arising from its age. It should be noted, however, that of the 156 children in whom protection was sought only 1 showed no benefit from the injection. When attenuation was sought, the outcome was more satisfactory (98% successful), which seems to indicate that if any deterioration of gamma-globulin did occur with the passage of time it was slight.

CONCLUSIONS

The prophylactic under examination in the trials described in this report was human-serum gamma-globulin prepared in America by the process devised by E. J. Cohn. The small quantity available has limited the scope of the experiments, but the following conclusions may be stated:

1. Gamma-globulin, prepared by Cohn's method, contains measles antibodies in high concentration.

2. The volume of gamma-globulin required for the prevention and attenuation of measles is about half the volume of convalescent measles serum required.

3. Though superior in action to convalescent measles serum, gamma-globulin in the doses used in these trials did not give full protection in all cases. Some degree of attenuation was, however, obtained in almost all cases.

4. Though the potency of solutions of gamma-globulin cannot be quantitatively estimated, the samples examined nearly two years after their preparation showed high protective and attenuating properties, differing but little from others which had been in circulation for a shorter time.

5. No local or general reactions followed the injection of gamma-globulin.

OPERATIONS FOR HERNIA

TECHNIQUE OF NYLON DARN

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From the Department of Surgery, Radcliffe Infirmary

A REVIEW of the results of hernia surgery during the late war has revealed an alarming number of recurrences (Edwards 1943), and this disclosure has led to a reconsideration of the whole subject of hernial repair. It is clear, from an analysis of cases in the Services, that many of the recurrences were the result of bad surgery by inexperienced operators. Others have thrown a share of the blame on our inadequate knowledge of the mechanism of the inguinal canal; and, as new interpretations of this mechanism are made, new operations are devised to fit in with these ideas.

It is as well to recall that, by methods in use long before the war, the worst of herniæ were capable of repair, and that herniæ recurrent for the fourth or fifth time have been eventually cured by an operation properly planned and performed. There appears to be an increasing tendency to condemn the Bassini operation in its original form, and an inclination, in larger herniæ at any rate, to use some form of darning or filigree operation. For the repair of weaknesses and deficiencies in our hard-worn fabrics no method has been so successful as darning, provided the darn is woven firmly and without tension into sound surrounding material.

Silk, thread, silver wire, and fascial strips have all been used with great success for the repair of weaknesses in the inguinal canal and other sites. We believe that the material used to lace the deficient region matters less than the care of the operator and his adherence to a few guiding principles. When a darn is made in the tissues, a mesh is formed which is invariably filled by fibrous tissue. In the production of fibrosis the mesh is the important factor and not the nature of the material used to form the lattice. The end-result of a darn is a buttress across the weak area consisting largely of suture material together with various amounts of fibrous tissue. The effective constituent of the buttress is the suture material; and, though fibrous tissue is laid down and is helpful, it is neither essential nor dependable for permanent repair. Since the buttress is the important factor and not the fibrosis, the most suitable material for a darn is that to which the tissues take most kindly.

The requirements for a lattice are that it should be (1) tailored for the individual, (2) of small mesh, (3) well anchored to surrounding tissues, (4) pliant, (5) productive of a minimal tissue reaction, (6) technically simple to introduce, (7) undisturbed by the misfortunes of sepsis and so suitable for strangulated cases, and (8) a permanency in the tissues and not absorbed or dislodged at a later date. We have found that 'Nylon' satisfies these conditions better than any other material.

We do not present here the results of a late follow-up, for Burdick et al. (1937) showed, in a series of 1485 cases of hernia, that 40% of recurrences occurred after two years, and similarly Block (1933) found, in the cases he investigated, that 34·8% of recurrences occurred after two years. In view of the findings of these and other workers, five years should elapse from the time of operation before it is worth while assessing the cases to obtain an accurate recurrence-rate. As regards immediate healing, half our cases have been seen more than six months after operation, and only in the case of a huge umbilical hernia, which became septic after repair, has there been any sign of a recurrence.

Nylon has been used in operations for hernia by Melick (1942) in 10 cases, and by Haxton (1945), but neither of them has stated his methods. We have evolved a technique which closely simulates the darn with silk used by Ogilvie (1937): but, since we have had to overcome certain difficulties resulting from the nature of the material, we include details of technique. The advantages of nylon as a suture material have been emphasised by other workers to whom Haxton referred, and it was his article which first drew our attention to its merits. We have used nylon for many other purposes, but here we are confining our attention to its use in hernia. The cases treated by three surgeons in the fifteen months up to April 30, 1947, are analysed as follows:

	Simple hernia	*Strangulated hernia*	*Total*
With darn:			
Inguinal	140 (Indirect 116, direct 24)	13	153
Incisional	7	1	8
Umbilical	8	4	12
Total	155	18	173
Without darn:			
Inguinal	21	0	21
Femoral	18	18	36
Total	39	18	57
All cases ..	194	36	230

TECHNIQUE

The inguinal canal is approached through a crease incision. The cremaster muscle is incised and subsequently dealt with according to inclination. In direct herniæ the sac, unless large or funicular, is not excised. Next, the internal ring is examined carefully: where it is fairly well defined and has strong edges it is repaired by interrupted sutures medial to the cord. In large herniæ the ring may be virtually destroyed, and all that is left is a ragged edge of transversalis fascia. In these cases the lower edge of the internal oblique muscle is retracted upwards, and a nylon suture no. 5 on a no. 13 round-bodied half-circle needle is passed through the posterior aspect of the internal oblique muscle and then down to Poupart's ligament, picking up the ragged edges of the transversalis fascia on the way, and back again in a similar fashion, passing once again through the fascia and muscle (fig. 1). This suture is tied firmly, thus tightening the region of the internal ring about the cord, though no attempt is made to force the internal oblique muscle against the inguinal ligament.

The darn is now begun. It consists of two layers between the upper and lower boundaries of the inguinal canal. The suture used is a 40-in. length of no. 5 nylon for the first layer and no. 7 nylon for the second layer, threaded on a small round-bodied half-circle needle. After being threaded through the needle the ends of the suture are knotted together, thus preventing it from becoming unthreaded. The original 40-in. length thus becomes a double length of 20 in. and is darned as such. The first layer of the darn is started by passing the needle through the dense fibrous tissue in the medial aspect of the pubic tubercle, and this stitch is anchored by passing the needle back through the loop formed by the knotted ends (fig. 1). It proceeds as a continuous suture between the lower edge of the internal oblique muscle and the inguinal ligament, and, as in the second layer, the stitches are placed four or five to the inch (fig. 2). This layer is completed when it reaches the internal ring. No attempt is made to approximate the internal oblique muscle to the inguinal ligament, and the chief function of this first layer is to bed the structure down on the posterior wall of the inguinal canal, making ready for the next and more important layer of sutures.

The second layer starts like the first. Below, it picks up the inguinal ligament in between the points occupied by the first layer. Above, it is passed through the rectus sheath medially, and, as the outer end of the canal is approached, the suture passes through the tendinous portion of the internal oblique muscle. It is most important to carry the sutures high up laterally and to make certain that it is the tendinous portion of the internal oblique muscle that is included, so that when strain comes it can be taken by structures well able to deal with it (fig. 3).

When the internal ring is reached, two or three sutures are passed *lateral to the cord, helping to reinforce the inguinal* ring. In most cases this completes the darn; but, where a large defect exists, further diagonally placed sutures are used, interlocking with the vertical ones in a manner similar to that used for darning a sock. All sutures are placed without tension but with no slack. Nylon glides through the tissues most pleasantly and does not stick or drag like thread or silk; hence the tension can be adjusted with great ease. As the end of each suture is reached it is finished by tying two half-hitches (fig. 2). Usually three lengths of 40-in. nylon, doubled, are required, but in large defects as many as six lengths have been used.

After the darn is completed, the cord is allowed to fall back into place. The external oblique aponeurosis is repaired with a single suture of no. 5 nylon. By the bootlace method (fig. 4) a knot in the region of the external ring is avoided. The suture begins on the deep surface so that the knot lies beneath the aponeurosis. Sometimes it is difficult to finish a suture line in this manner, in which case the suture ends may be buried by the method illustrated (fig. 4). Either of these manœuvres, which are applicable in other operations, prevents the ends of the nylon from projecting through the skin later. In thin persons, if the ends are simply cut after knotting and not buried they tend to present beneath the surface, or even to work through the scar and appear like the short bristles of a brush.

Finally the subcutaneous tissue and Scarpa's fascia are closed by interrupted sutures of no. 3 nylon, and *the skin is* closed with Michel's clips, which are removed in three days. In about half these cases a frosting of penicillin and sulphathiazole powder has been dusted over each layer as it is closed.

In other types of hernia orthodox repairs were used with nylon as the suture material, and in large incisional and umbilical herniæ nylon was darned in the aponeurotic tissues across the suture lines.

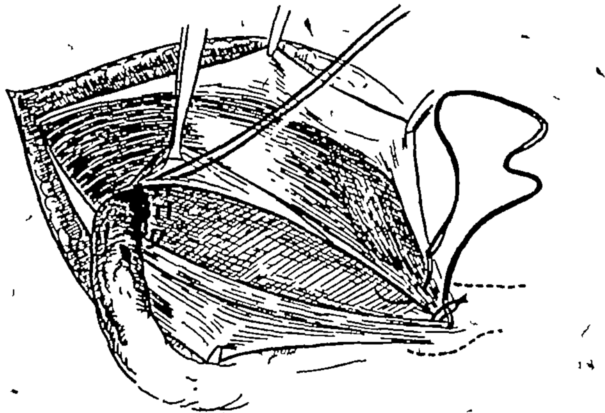

Fig. 1—Suture reinforcing internal ring, and start of darn, showing how knot is anchored.

RESULTS OF WOUND HEALING

Simple Hernia.—In 159 of 161 *simple inguinal hernia* not so much as a stitch abscess developed. The superficial tissues healed without swelling, and the deep tissues showed no sign of serum production. Six *weeks after* operation the skin-crease incisions gave a fine scar in most instances, the skin being supple and the inguinal region firm but not unduly hard. More than half of these darn cases have been seen six months after the operation with no sign in any of them of recurrence or other wound troubles. The 2 cases of sepsis were as follows:

Case 1.—A huge hydrocele on the same side as the hernia was *excised at the* time of the repair of the hernia. A scrotal

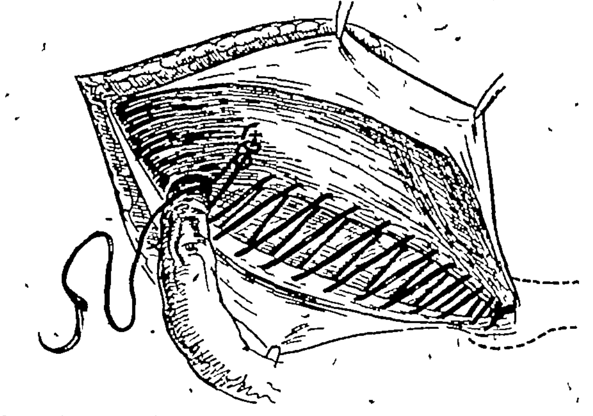

Fig. 2—Loose continuous suture between lower edge of internal oblique muscle and inguinal ligament.

hæmatoma formed and subsequently suppurated, with *discharge from the inner end of the incision, Staph. aureus* being cultured. The inflammation rapidly subsided, and the wound healed in sixteen days from the time of operation, giving no further trouble. The repair was sound six months after operation.

Case 2.—This was the only instance of infection of the repaired tissue. On the sixth day after inguinal darn the wound looked red and on the eighth day a heavy discharge escaped. For a further ten days discharge continued, *after* which the wound healed. The repair was to all *appearances* unaffected by the sepsis when seen three months after *operation*. In this instance neither sulphonamide nor penicillin was used at the time of operation or in the treatment of the infection.

There was 1 case of sepsis in 7 cases of *simple incisional hernia*:

Case 3.—About 4 yd. of nylon was used to darn a large upper abdominal defect. Owing to inadequate suturing of the cutaneous flap, a pool of serum formed which discharged from the lower end of the wound three weeks after operation Healing proceeded slowly until only a small cavity at the lower end of the wound remained. This cavity was laid open, there being no sign of the nylon, which was completely covered by granulation tissue. Subsequently, wound healing progressed in the usual way with a saucerised wound, the final result being firm union. At no time was there extrusion of any nylon. Neither penicillin nor sulphonamide was used in the treatment of this wound. Proteus was the only organism grown from the wound.

In 8 cases of *simple umbilical hernia* there was 1 case of sepsis:

Case 4.—A huge deficiency in an extremely obese woman weighing over 20 st. Several yards of nylon was darned across a Mayo overlap repair. The extensive wound suppurated on one side, *Bact. coli* and β-hæmolytic streptococci being cultured from the discharge. This wound continued to discharge until a small cavity was treated by saucerisation, after which the deficiency soon healed by granulation. There was no sign of an attempt of the tissues to extrude the nylon. This wound had been dusted with sulphanilamide at the time of the repair, but no chemotherapy was used to treat the subsequent infection. The hernia recurred at the site of wound sepsis.

In 18 cases of *simple femoral hernia* no sepsis developed

Strangulated Hernia.—In 5 cases the patients died within six days of operation; since there was not time enough for wound assessment they are not included in our figures. Of the remaining 36 cases 2 developed sepsis (1 of 13 inguinal and 1 of 18 femoral) as follows:

Case 5.—After an enormous strangulated inguinal hernia had been operated on, a hæmatoma of the scrotum became infected and a scrotal abscess formed. It was not observed early in the convalescent *home to* which the patient had been sent, and the abscess became thickly encapsulated A discharge subsequently appeared from the inner end of the incision, *Bact. coli*, proteus, and *Staph. aureus* being cultured from it.

It was necessary to drain the abscess by scrotal incisions, and at this second operation it was seen that the tissues in the region of the darn had firmly healed and the infection had not disturbed them. Owing to the thick wall of the abscess the scrotum took till ten weeks after the operation to heal. The inguinal repair was not disturbed by the adjacent infection.

Case 6.—After a hernia containing gangrenous bowel had been repaired, the wound broke down on the fifth day and discharged for six days before it healed. No subsequent weakness was found three months after operation.

There was no sign of weakness of the wound after operation on any strangulated hernia.

Comment.—The rarity of sepsis in hernia wounds sutured with nylon confirms our experience of nylon in septic wounds. We have used nylon to close in layers, with the support of a dusting of a sulphonamide powder in each layer, many infected wounds, as in appendicitis with general peritonitis, even when these wounds have been bathed in pus. In spite of the presence of infection some hundreds of cases healed by first intention. In 5 cases the wound became infected, and all except 1 healed within three weeks. In one child, two small knots were extruded before the wound healed. In the only case which did not heal—a bowel resection for carcinoma with a grossly infected wound—a sinus formed in relation to a large knot; when the small cavity was laid open and this knot excised, the wound healed by granulation.

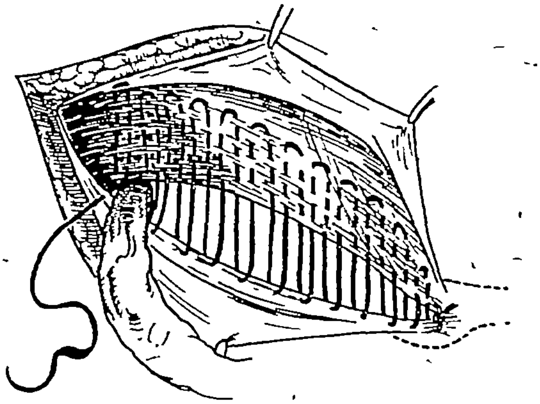

Fig. 3—Second layer of continuous suture, passing through rectus sheath medially and tendinous portion of internal oblique muscle laterally.

In a few early cases in which we used nylon for suture of aponeurotic layers the ends pointed upwards beneath the wound and even worked their way through it. It was necessary to snip away the offending spikes in 2 cases. We have described above how this difficulty is overcome.

DISCUSSION

Repair of herniæ by darning with unabsorbable material has on the whole been followed by good results. The various materials used in the past have both good and bad qualities, but the main advantage of them all is that they form a lattice which resides in the tissues as a permanent shield to a weak area. Nylon has proved to be a highly satisfactory substance with which to form this lattice.

Silk has been in and out of favour for thirty years, its main drawback being the liability to sepsis of the tissues in which it is buried en masse. Ogilvie (1937) and Maingot (1941) reported excellent results with it in civilian use, but others have been troubled by primary sepsis and by sinus formation persisting until the fibres are extruded or removed. In comparison our nylon cases show a very low incidence of sepsis and, when it did develop, there was no attempt at mass or partial extrusion of the suture, but rather was there granulation and healing over the nylon fibres. Neither has there been any sign of late extrusion of the lattice with sinus formation, as described by Edwards (1943) as a frequent occurrence with silk after many of his own operations and those of others on Service patients. This capacity of nylon to withstand sepsis probably results from its monofilamentous, non-irritative, and resistant nature. Silk can harbour organisms in the interstices of its fibres, and the fibres can be attacked and partly digested by products of inflammation. The need for strict exclusion of infection from wounds in which silk is used as a darn calls for extremely careful wound management and a no-touch technique. Though ordinary aseptic precautions were taken in this series of nylon cases, in no instance was the no-touch technique used, fingers being as often in the wound as out of it. We have already mentioned the ease with which nylon glides through the tissues, in marked contrast to the occasional tug which is necessary to drag silk through a stitch hole.

Much the same remarks apply to thread as to silk.

The silver-filigree operation undoubtedly gives excellent results in some hands and is especially valuable for direct herniæ, as Cole (1941) showed. But it is not tailored for the individual like a darn, and Cole admits to the weakness of the medial angle by the edge of the rectus muscle, through which have occurred the few recurrences with which he has had to contend. A darn which starts well over the rectus sheath protects this weak area. Cole also mentions a serous discharge from the wound in some cases, usually about the seventh day. This has not been seen in our nylon cases. Silver wire resembles nylon in that it is monofilamentous, and though silver may irritate the tissues enough to produce a serous exudate it does not appear to encourage early or late sepsis or extrusion. Cole says: "In my experience *infection compelling removal or causing extrusion of filigree is unknown*, and I have failed to trace such an occurrence either by reference or report at the Seamen's Hospital. The same claim cannot be made for silk or fascia by the most ardent advocates."

Fascial-graft repair has given good results in some hands, as instanced by Williamson (1941) and D. C. Corry (personal communication). Others, such as Burdick et al. (1937), Gray (1940), and Wakeley (1940), have been dissatisfied with it and have had a high rate of recurrence. At operation for recurrences after fascial darn they have been unable to find the fascial sutures, a mass of fibrous tissue only being evident, the penalty possibly of relying on fibrous tissue rather than on a permanent shield in the tissues such as the nylon darn supplies. But in the hands of those who have produced good results with fascia there still remain certain objections. There is the necessity to go to the thigh for the

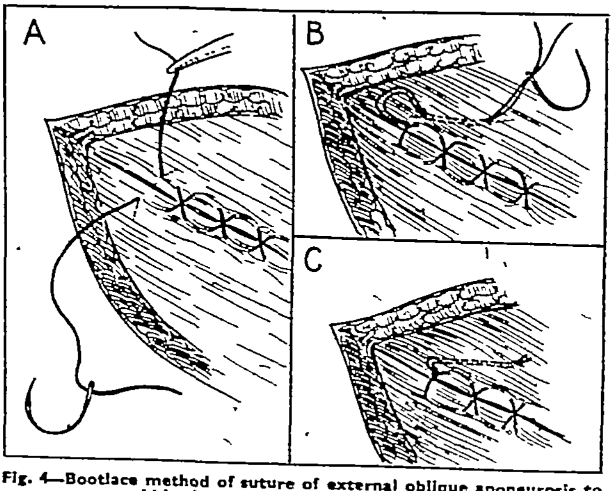

Fig. 4—Bootlace method of suture of external oblique aponeurosis to avoid having knot near external ring.

fascia, and, whether it be cut by fasciotome or open operation, a few cases show thigh disability for some time, and an occasional case even develops an ugly muscle hernia. This objection is a strong one in people who can claim pensions, such as Service personnel. Burdick et al. (1937) pointed out the damage and weakening of Poupart's ligament due to the large holes caused by the needle used to carry the fascia, leading sometimes to a slight recurrence in that region. In some patients with direct herniæ the fibrous tissues of the body are deficient and the fascia may be of poor quality and doubtful strength. The frequency of sepsis in fascial darns is high in some reports and low in others; but, if sepsis does develop, the repair is very liable to be destroyed and recurrence results (Williamson 1941).

The other objections to fascia are technical. The darn with fascia is not easy to perform, being seldom done efficiently in under 45 min. If bilateral cases have both sides treated at one session, it means a long operation. Beckman and Sullivan (1939), with an experience of 2000 cases of hernia, state that not only wound infection but also respiratory trouble was much more frequent when the operation was protracted. After an hour and a half 25% of the patients suffer from one of these complications. No doubt chemotherapy will reduce wound infection enormously, but hitherto it has had little effect on the incidence of postoperative lung complications in our own abdominal cases. The average case requiring bilateral nylon darn is usually completed in under an hour.

Though some surgeons may object to a nylon darn in uncomplicated hernia, in strangulated cases the repair of the defect by a nylon darn must be given special consideration in view of our findings. With the attendant high risk of sepsis in strangulated hernia, few surgeons, as a routine procedure, have performed with impunity a repair with thread, silk, or filigree. Fascia also is usually out of the question, for the patients are in a weakened state and react badly to the lengthy procedure of a fascial darn; moreover, as Williamson (1941) indicated, sepsis is liable to nullify the effects of a fascial darn. We have hitherto used a nylon darn in 18 strangulated cases, 5 of which required resection of bowel, and sepsis resulted in only 1 case. Further, 18 strangulated femoral herniæ have been repaired with sutures of nylon without sepsis. In all strangulated cases a sound repair has been obtained.

We have found nylon much easier to handle than other materials which might be used for a darn, such as stainless-steel wire and tantalum.

Since April 30, 1947, an additional 239 inguinal darns, direct, indirect, and strangulated, have been performed by ourselves and our assistants; sepsis occurred 5 times but all cases healed without extrusion of the darn. No inguinal case darned with nylon has yet recurred.

SUMMARY

Nylon has been used as a darning material to repair various kinds of herniæ, particularly direct and indirect inguinal herniæ, both simple and strangulated. It has given general satisfaction, especially in strangulated herniæ.

We are indebted to Sir Heneage Ogilvie for his advice and helpful criticism. The illustrations are the work of Miss A. J. Arnott, to whom we owe our thanks.

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FOUR CASES OF LEPTOSPIRA CANICOLA INFECTION IN ENGLAND

A SYMPOSIUM *

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INFECTION with *Leptospira canicola* is widespread among dogs, and the organisms are excreted in the urine for some months after recovery. Human cases of the disease were first recognised in Holland by Dhont et al. (1934), who isolated strains from 2 patients and from a number of dogs. Canicola fever in man has been reported from most European countries, North and South America, China and the Pacific Islands, but the total number is small. Minkenhof (1948) has collected from all over the world records of only 98 cases, nearly half of which were diagnosed in Holland.

In Britain one previous human case was investigated by Baber and Stuart (1946), but the source of infection was not traced, and Stuart (1938) found serological evidence of past infection in another instance. It may be of interest therefore to give in some detail the course of the disease in the present cases.

Case 1 (by L. J. M. L.).—An apprentice fitter and turner, aged 19, was admitted to hospital on Sept. 15, 1947, as a case of cerebrospinal meningitis. He had been taken ill suddenly, on Sept. 11, with frontal headache, fever, and sweating. Next day his eyes were red and the neck stiff. On the fifth day a pink blotchy rash appeared on the face and chest. The bowels had been confined 4 days and no drugs had been taken.

Previous Illnesses.—Measles and rubella.

Family History.—Nothing significant.

On Admission.—Fifth day of illness. Temperature 100·8°F, pulse-rate 68, respiration-rate 22 per min. The patient was a well-nourished young man, conscious, alert, and coöperative. The palpebral and bulbar conjunctivæ were intensely injected and red, with little discharge and pronounced photophobia. There was a pink discrete macular rash chiefly on the chest, abdomen, and back, and a little less on the face and extremities. The rash was morbilliform but lighter in colour than that of measles and not irritating. He had no cough, no Koplik's spots, and no redness or ulceration of the buccal mucosa. There was no enlargement of the lymph-glands or spleen and no jaundice. Clinical examination of heart, lungs, and abdomen revealed nothing abnormal. Blood-pressure 130/80 mm. Hg; urine, sp. gr. 1·020; no abnormality. There was no urethral discharge and no sore on the genitals. There was some stiffness of the neck on flexion but Kernig's sign was negative and he could kiss his knees. Cranial nerves, fundi, and ears were normal. There was no loss of power or sensation and all the reflexes were normal. Lumbar-puncture fluid clear and colourless with less than 4 cells per c.mm.: protein 30 mg. per 100 ml.; chlorides 690 mg. per 100 ml; and no organisms.

Subsequent Course.—On Sept. 19 (8th day) his temperature was 101·4°F, he was drowsy, his neck was more stiff, he could not kiss his knees, and Kernig's sign was positive. Lumbar puncture now gave a faintly opalescent spinal fluid with 200 cells per c.mm. (mononuclears 50%); protein 30 mg per 100 ml.; chlorides 680 mg. per 100 ml.; no organisms, and sterile on culture. White-cell count: 6800 per c.mm. (polymorphs 76·5%, eosinophils 0·5%, basophils 1%, monocytes 1%, and lymphocytes 21%). Blood-culture (twice), Widal test, Wassermann and Kahn tests, and Paul-Bunnell tests were all negative. X-ray films of the nasal sinuses showed no evidence of infection.

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* The four cases described in this communication are recorded by three clinicians and the final serological diagnoses were made by the bacteriologist. The case-reports are the work of the individual physicians, each of whom is responsible for his own stated opinions only. It seemed advisable to publish all the records together.

On Sept. 20 (9th day) his temperature was normal and it remained normal afterwards. The rash faded rapidly after that date without leaving any staining of the skin. On Oct. 3 (22nd day) his eyes were normal, all traces of meningitic signs had disappeared, and no abnormal neurological signs could be detected. He was discharged home quite well on Oct. 20, the 39th day after the illness began.

A differential diagnosis had to be made between rubella, measles, erythema multiforme, Stevens-Johnson syndrome, and secondary syphilis. The possibility of some bacterial or viral meningitis had also to be considered. Against rubella was the late appearance of the rash, its larger elements, and the absence of enlargement of lymph-glands. Against measles was the colour of the rash and the absence of staining, the total absence of cough, and the lack of swelling of the eyelids and of discharge in the presence of such a severe conjunctivitis. The shape and distribution of the skin lesions and the absence of involvement of the buccal mucosa did not suggest either erythema multiforme or Stevens-Johnson syndrome. The rapid subsidence of the eruption and the negative serological tests excluded secondary syphilis. The rash bore no resemblance to any seen in meningococcal infections, and the negative blood-culture, the sterile cerebrospinal fluid, and the patient's rapid recovery were against cerebrospinal fever.

A diagnosis of "aseptic benign meningitis" of virus ætiology—e.g., poliomyelitis, choriomeningitis, &c.—was not acceptable as it did not account for two outstanding features, the severe conjunctivitis and the macular rash. The possibility of leptospiral meningitis was then thought of,† and by a series of agglutination tests of blood taken on the 24th, 50th, and 100th days after the onset a diagnosis of infection by *Leptospira canicola* was established. The details of the serological tests are given below.

The patient had kept a puppy, six months old, just before his illness, but so far as he knew the dog was healthy. Unfortunately this dog was accidentally killed before the patient's infection was diagnosed.

TABLE I—AGGLUTINATION OF *L. canicola* AND *L. icterohæmorrhagiæ* BY SERUM OF CASE 3 AT DIFFERENT INTERVALS AFTER ONSET OF DISEASE

Serum titre against	Days after onset				
	12	14	24	32	150
L. canicola ..	1/3000	1/10,000	1/10,000	1/10,000	1/300
L. icterohæmorrhagiæ ..	1/30	1/300	1/100	1/100	0

0 = No agglutination in dilution of 1/10.

(I wish to thank Dr. H. S. Banks, physician-superintendent, for permission to publish an account of this case, Dr. J. E. McCartney for the pathological reports, and my colleague Dr. Isenberg who kept the clinical notes.)

Case 2 (by T. S. M. N.).—A woman, aged 28, was admitted to hospital on Sept. 25, 1947. She had been quite well until 5 days before admission, since when she had suffered from increasing headache, vertigo, and vomiting. Small red spots, which disappeared after 24 hours, had been noticed on the right arm and on both legs.

On Admission.—Fifth day of illness. Temperature 101°F, pulse-rate 84, respiration-rate 20 per min. The patient was pale, her tongue was furred, there was well-marked neck-rigidity, and Kernig's sign was positive. The eyes, cranial nerves, and ears were normal. Lumbar puncture (3 hours after admission): fluid turbid; 1320 cells per c.mm. (lymphocytes 80%); total protein, 100 mg. per 100 ml., excess of globulin; chlorides 750 mg. per 100 ml.; no bacteria (including tubercle bacilli) seen in films; culture sterile.

Subsequent Course.—On Sept. 26 (6th day) her white-cell count was 8000 per c.mm. (polymorphs 44%, eosinophils 3%, basophils 2%, lymphocytes 46%, large mononuclears 5%).

The patient was treated with 60,000 units of penicillin 3-hourly for 5 days, and sulphadiazine to a total of 34 g. over 4 days. Her temperature settled in 36 hours after admission and her general condition rapidly improved.

On Sept. 29 (9th day) the left pupil was larger than the right, and there was left-sided ciliary injection. Neck rigidity had disappeared, and Kernig's sign was negative. Lumbar puncture: fluid slightly opalescent; 33 cells per c.mm.; total protein 40 mg. per 100 ml., globulin not in excess; no bacteria seen in films; culture sterile.

TABLE II—AGGLUTINATION OF *L. canicola* AND *L. icterohæmorrhagiæ* BY SERUM OF CASE 3 AFTER ABSORPTION

Titre against	Serum absorbed with		Unabsorbed
	L. canicola	*L. icterohæmorrhagiæ*	
L. canicola	0	1/3000	1/10,000
L. icterohæmorrhagiæ	0	0	1/300

0 = No agglutination in dilution of 1/10.

On Oct. 6 (16th day) the pyrexia recurred and persisted for 48 hours. The tip of the spleen was just palpable. On Oct. 8 (18th day) she insisted on taking her discharge from hospital because she was worried about her four children. She attended the medical outpatient department on Oct. 20 (30th day), when she felt well but showed right-sided ciliary injection and bilateral blurring of the edges of the optic discs was seen. Between the 40th and 90th days of her illness the patient reported to the outpatient department on three occasions, complaining of severe headache. Since then she has remained well.

The combination of acute aseptic meningitis and ciliary injection suggested a leptospiral infection (Buzzard and Wylie 1947), and a diagnosis of *L. canicola* infection was confirmed by the serological findings which are reported below.

Until very shortly before the illness began the patient had a puppy which had diarrhœa and she frequently cleared up its urine and fæces. She had disposed of the puppy before coming to hospital and could not trace it.

Case 3 (by J. M.S.).—A woman, aged 40, was admitted to hospital on Oct. 1, 1947, with the following history.

On Sept. 23 she had a headache and malaise and in the evening suffered from an attack of shivering. Next day, the symptoms were worse and there were aching pains in the limbs. The patient collapsed on getting out of bed, and her temperature was found to be 105°F when she was seen later in the day by her doctor. On the 3rd day meningitis was suspected and a course of sulphathiazole treatment begun. On the 4th day vomiting became troublesome, and a mistiness of vision developed in both eyes and lasted for 48 hours. The patient was unable to see objects directly ahead but could see things "out of the corner of her eyes" fairly clearly. On the 5th day spots, similar in appearance and distribution to erythema nodosum, appeared on both legs, but they cleared in about 2 days. By the 8th day it was evident that the condition was not responding to sulphonamides and the patient was sent to hospital for further investigation.

On Admission.—Ninth day of illness. The patient still complained of severe occipital headache and pain at the back of her neck. There were now no pains in the limbs and no further nausea or vomiting. Micturition was normal, but she was severely constipated. She looked ill and was flushed and

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† I am indebted to Dr. E. T. Conybeare, of the Ministry of Health, for the suggestion in the summer of 1947 that some cases of lymphocytic meningitis might be due to leptospirosis.—L. J. M. L.

Such energies are foreign to chemical reactions, for these are concerned solely with orbital electrons and involve no disintegration of the atomic nucleus. Expressed in units similar to those used in nuclear reactions, the entire range of chemical reaction energies falls between 0 and 10 electron volts (Kamen 1947), a figure which contrasts with the beta-particle energy of the hydrogen isotope tritium, which, though classed as an emitter of low energy, achieves 0·015 million electron volts.

Some isotopes emit alpha particles as well as the foregoing; these are of large mass, low velocity, and great destructive power, but such isotopes are uncommon and infrequently used in biological studies.

Adequate information about the pathological potentialities of radioactive isotopes is lacking, especially about the late effects of isotope administration, though it is possible, in view of the large amounts of radioactive material which have already been administered to patients, that time will remedy this deficit. Meanwhile it is often necessary to draw conclusions from the better-known effects of radium emanations, which, though different in some ways from the emission of most isotopes, may be considered similar from the practical point of view. The main disturbances following undue exposure to radium or to X rays are skin effects, blood changes, genetic effects, sterility, and late neoplasia. A radioactive isotope can produce all these effects if it is present in large enough amounts and for a sufficient time.

SKIN EFFECTS

Epilation of the skin is observed commonly after undue exposure to radiations, and this effect may manifest itself upon the backs of the hands of those who handle radioactive substances; but a more serious consequence is a radiation necrosis, which appears after a latent interval and is slow to heal and extremely painful. A carcinoma is a not uncommon sequel. Certain of the rarer radioactive substances, such as plutonium, produce fibrosarcomas, even if the site of entrance is but a small cut in the finger. In animals an injection of 1 µg. of Pu^{239} is adequate to produce them, and bone sarcoma is a common occurrence after the introduction of fission products (Lisco et al. 1947).

As regards the commoner isotopes, skin tumours after beta burns from P^{32} have been noted by Raper (1947), who enclosed mice and rats within bakelite boxes containing radiophosphorus in their walls. In man, isotope burns are not uncommon, 5 millicuries of P^{32} being quite sufficient, or even a less amount if the skin is exposed to the active substance for a long time, as exemplified by the damage to terminal phalanges of those painting luminous instrument dials (Horner 1942).

The guiding star of the isotope worker is the law of inverse squares, and it is to be remembered that a specimen having a small total activity "measured across the bench" may give an enormous tissue dose underneath the finger-nail. This is of special importance to those concerned with the local application of isotopes for the treatment of skin diseases.

BLOOD CHANGES

Raper (1947) has remarked on the unchanged blood picture of the rabbit exposed to considerable amounts of beta radiation from P^{32}. It is evident that even in the case of gamma radiation the blood picture is an unreliable indicator of early damage (Lorenz et al. 1947), while Jacobson and Marks (1947) go so far as to suggest that any change should exclude a worker from further exposure.

As regards "neoplasias," Lorenz et al. (1947) have noted leukæmia and the production of carcinomas in animals not usually subject to them, and these with irradiations within the so-called tolerance range. In this connexion the raised incidence of leukæmia in those who handle radium or use X rays will be recalled. It is well to remember that, in all probability, radiation damage to the hæmatopoietic system, as to the skin, is not completely reparable (Stone 1947).

GENETIC EFFECTS

The possibility of genetic change as a result of ionising radiation has been discussed at a symposium held at the British Institute of Radiology (*Nature* 1946) and has been mentioned by McWhirter (1947) in connexion with the internal use of radioactive isotopes, by Van Roojen (1946) as a by-product of atomic warfare, and by Voegtlin (1941) in relation to clinical and laboratory personnel. Spear (1946) and Muller (1947) have provided full accounts of the genetic and other biological effects of penetrating radiations, and, although there is insufficient evidence on this important issue, Snell's (1941) observations certainly suggest that such might indeed occur, with possible evil effects on subsequent generations. As regards these effects, Newell (1941) says: "Even small doses of radiation administered to persons who may in the future have children are looked upon with extremely grave apprehension," and Henshaw (1945) has pointed out that radiation effects on genes and chromosomes occur without threshold.

STERILITY

Reduced sperm counts were observed after the atomic bombing of Hiroshima, and Platt (1947) has reported pathological changes in patients treated with P^{32}, with testicular and ovarian findings suggesting a distinct possibility of sterility, even though the doses used were only 0·1–2·5 millicuries two or three times a week. Whether such changes are reversible is uncertain, but current observations suggest, in mice, the recovery of the testis but not of the ovary. Lorenz et al. (1947) noted that total doses of 770–880r produced lasting sterility in female mice, regardless of the rate and intensity of administration, thus suggesting the possibility of cumulative damage.

EFFECTS OF INGESTION

The actions of radioactive materials taken into the body have certain special aspects. Many are familiar with the bronchial carcinomas of those who work in radioactive dusts, the bone sarcomas and aplastic anæmias of the old-time luminous watch-dial painters, and the terrible end of Dr. S. A. Von Sochocky (Martland 1929), who died with severe burns, hæmoptysis, hæmaturia, retinal hæmorrhages, and bronchopneumonia after exposure to radioactive materials in his laboratory. It may be noted, for comparison, that a lethal dose of tetanus toxin is about 220 µg., whereas 1 µg. of radium distributed throughout the body is sufficient to produce a fatal outcome, and even a tiny dust particle containing C^{14}, if inhaled, can give rise to a point dosage of radiation above the tolerance limit for tumour production. A resemblance to radium is shown by certain other radioactive substances, and Brues et al. (1947) have pointed out that Sr^{89} (half-life 55 days) is a most efficient producer of bone tumours, and that Ce^{144} causes liver damage as well as bone sarcomas. Y^{91} is almost unabsorbed from the gut, but it can produce several intestinal disorders. The tendency of the fission products to produce bone tumours depends mainly on their propensity for selective absorption in these structures (Hamilton 1947). Of the more common isotopes, there is no doubt that P^{32} can produce deleterious effects.

The clinician who proposes to administer a radioactive substance to a patient takes upon himself a grave responsibility, and such a project involves a consideration of the dose, the half-life of the element and emission energies, the manner of its body distribution—i.e., otal body (sodium) or local tissue concentration (iodine), he excretion-rate, and the extent of tissue dilution.

It is evident that, for many substances, adequate nformation is not available on all these points; and, s regards dosage, one has to admit that isotope standardisation is still somewhat unsatisfactory, and lisastrous consequences may follow inadvertent overdosage. Some estimation of the amount of radiation received is requisite and can be obtained with the help of the following formulæ:

$R = 60\ CE_{av}$, which deals with daily roentgen dose R, derived from an isotope with average tissue concentration C in millicuries per kg. of average particle energy E_{av}. For simple beta emitters $\frac{E\ max}{3} = E_{av}$. If there are gammas also, 20% must be added.

For a short-life isotope the total dose is more important d is given by the following:

$D = 1{\cdot}44\ RT$, when D = dose in R; R = initial daily se from the first formula; and T is the half-life in days.

For details Marinelli (1942) or Evans (1947) should be onsulted. The upper tolerance limit varies between 01 and 0·1 roentgens a day, according to different uthorities, but in this connexion it must be admitted at it is difficult to ascribe a tolerance dose to such diation damage as late neoplasia, premature ageing, nd genetic change. Henshaw (1945) suggests that tolerance injury" would be a better term in these ases, pointing out that, though the individual is continually bombarded by earth and cosmic radiation at bout 0·001r a day, the range of radiation exposure ompatible with life is none the less narrow.

CONCLUSIONS

It is to be emphasised that, in human experimentation, here is no excuse for using an isotope technique when ome ordinary chemical procedure would suffice. If the roblem will not yield to a chemical approach, it is esirable before using a radioactive isotope to consider the possibilities offered by a stable isotope which can be readily detected and, with the exception of deuterium, can be administered ad lib. without biological effect. Radiophosphorus should not be used in the treatment of patients in the reproductive period of life, or who have an expectation of life of five years or more (*British Medical Journal* 1947).

Isotope work is totally unsuited to a general laboratory such as the clinical laboratory of a hospital. Unless special precautions are taken, the benches, sinks, and furniture can become heavily contaminated with radioactive materials; and, if elements of long half-life, such as Co^{60}, Sr^{89}, or Zn^{65}, are used, the accumulated radiation may soon reach a dangerous level. Excellent accounts of laboratory hazards and the means for reducing them have been given by Sullivan (1947) and in some textbooks on radium.

Finally, those intending to employ radioactive isotopes for clinical purposes should make contact with the isotope section of the Medical Research Council, where advice from experts is readily available.

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NEONATAL GASTROCOLIC FISTULA

REPORT OF A CASE

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NEONATAL gastrocolic fistula being extremely rare, the following case is of interest.

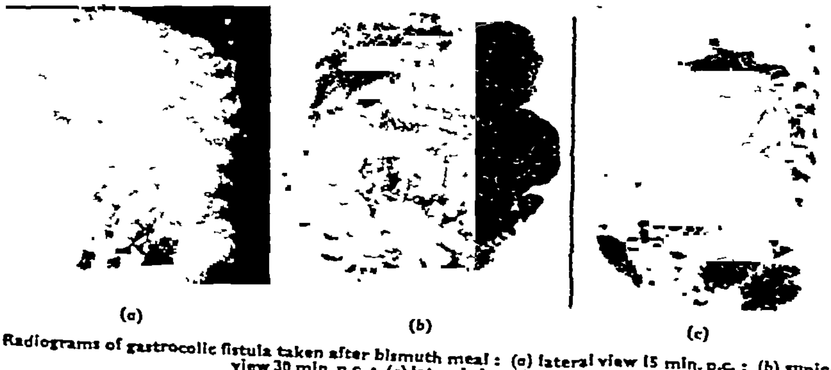
A male baby, aged 5 weeks, was admitted to the Southampton Children's Hospital because of difficulty with feeding and lack of progress.

The mother had been well during her pregnancy. The baby had been apparently healthy at birth though somewhat cyanotic on delivery and the usual methods of resuscitation had been applied.

During the first week or two the baby had been lethargic and had taken the breast poorly. Several brands of artificial milk were tried, but he continued to lose weight. Stools had become large, greenish, offensive, and slimy, and numbered about seven daily. Vomiting had increased, and the baby's condition had deteriorated sufficiently to merit admission to hospital.

On examination the baby weighed 7 lb., and, though normal in size, was obviously undernourished. His breath had an acid odour, and there was thrush in mouth and pharynx. Abdomen much distended and tympanitic; greenish slimy undigested food in rectum. Nothing else abnormal found.

Blood-count: red cells 3,150,000 per c.mm.; Hb 54%; white cells 10,400 per c.mm. (polymorphs 48%, lymphocytes 45%, monocytes 7%). Blood Wassermann reaction negative.


(a) (b) (c)

Radiograms of gastrocolic fistula taken after bismuth meal: (a) lateral view 15 min. p.c.; (b) supine view 30 min. p.c.; (c) lateral view 30 min. p.c.

Treatment was directed towards relieving dehydration and regulating feeds. Transfusions of citrated blood were given into scalp veins to combat anæmia.

Progress.—The baby put on ½ lb. in weight, which remained stationary for another ten days but then began to decrease because vomiting and diarrhœa, which had ceased on admission to hospital, began again. Vomit was highly acid, mustard-coloured, and rather offensive, and came up after each feed. Stools were at first normal in colour and consistence but, after a few days, began to resemble the vomit.

The vomit was now recognised as having a fæcal character; so gastrocolic fistula was tentatively diagnosed. This was confirmed by radiography after a bismuth meal. Radiograms taken at 15 min. and 30 min. in lateral and supine positions showed bismuth flowing directly from stomach into transverse colon (see figure).

Operation.—Next day laparatomy under local anæsthesia was performed by Mr. L. A. Richardson. Fistula between stomach and colon was easily found. It was about half an inch in diameter and connected greater curvature of stomach about its mid-point with transverse colon about 1 in. from splenic flexure.

Fistula appeared to be of inflammatory origin, since stomach easily peeled off colon, disclosing layers of œdematous tissue. Colon and stomach were closed separately, operation being rapidly completed.

Postoperative Course.—Penicillin and succinyl sulphathiazole were given, and small feeds at short intervals, but the baby died two days after operation.

Necropsy Findings.—Operative area free from infection: suture lines in stomach and colon healthy. Inside stomach an ulcer 3 mm. in diameter was found, which on section appeared to be a small chronic gastric ulcer. Microscopically mucosa showed ulcer and sinus with much subacute inflammation and granulation tissue.

COMMENT

The ætiology of the gastrocolic fistula is problematical. Any kind of developmental fistula seems embryologically improbable, whereas the inflammatory character of the tissues adjacent to the fistula strongly suggests a peptic ulcer which, starting in fœtal life, had perforated the adjacent colon.

I wish to thank Dr. K. E. Slaney for kind permission to publish this case, and Dr. G. Ormiston for his helpful criticism.

APPARENT ACUTE GLOMERULONEPHRITIS WITHOUT ALBUMINURIA

REPORT OF A CASE

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ALBUMINURIA is usually regarded as essential to a diagnosis of acute glomerulonephritis. In the following case, however, we felt justified in making this diagnosis in spite of the failure to detect any urinary abnormality apart from the doubtful presence of albuminuria on one occasion.

A girl, aged 16, employed as a pill-packer, was admitted to Hammersmith Hospital on Feb. 14, 1947. She had previously been healthy except for an attack of "eczema of the scalp" at the age of 7, and a similar attack, diagnosed as pediculosis capitis with secondary infection, in April, 1946.

Three weeks before admission she developed a dry cough and a slight sore throat. She felt ill and remained in bed for a week. She then returned to work, but the cough persisted. On Feb. 9 she had a severe frontal headache and noted that her eyes were puffy. Next day she complained of pain in the region of the lower sternum and of breathlessness on exertion. That night the pain and breathlessness were so severe that she could not lie down. On Feb. 11 she noted swelling of her face; she had 4 loose stools on Feb. 13; and on the 14th, the day of admission, her legs and ankles became swollen.

On admission her temperature was 99·8°F, pulse-rate 64 and respirations 28 per min., and blood-pressure 176/96 mm. Hg. She was pale and orthopnœic. There was well-marked puffiness of the face, a sacral pad of œdema, and gross pitting œdema of the ankles. The jugular venous pressure was level with the sternal angle. The liver was not palpable. The optic discs appeared normal. The fauces were a little reddened. The heart showed accentuation of the secon sound at the apex; occasional râles were heard at the bas of the lungs. There was no evidence of coarctation of th aorta.

Urine: sp. gr. 1·020, no albumin, no sugar; deposit contained a few epithelial cells, an occasional leucocyte, an numerous mobile bacilli, but no casts.

Progress.—The patient was treated in bed on a low-protei low-sodium diet, with fluids restricted to a litre a-day for th first week. Intramuscular penicillin, 30,000 units thre hourly, was given for the first three days. Diuresis bega within thirty-six hours of admission, and œdema disappeare by the sixth day in hospital. Her temperature reached 100° on the second evening and was thereafter normal. Her bloo pressure rose to 182/110 mm. Hg on the fourth day but ha fallen to 126/70 by the seventh. A small right pleural effusio confirmed radiologically, developed on the second day aft admission and disappeared in a few days. Transient systol cardiac murmurs appeared at the apex and in the second righ interspace as the blood-pressure fell.

The urine was examined at least once daily throughou Albumin was reported by a nurse in an early morning specime on the eleventh day; this specimen was unfortunately di carded, but another tested later the same morning showed n abnormality. Apart from this occasion, no abnormality wa detected throughout the patient's stay in hospital. She wa discharged on March 25 without symptoms or abnorm physical signs.

Investigations

Blood-urea: Feb. 17, 24 mg.; Feb. 21, 33 mg. per 100 m

Blood-proteins: Feb. 21, total 8·7 g., albumin 5·0 g globulin 3·7 g. per 100 ml.; March 5, total 7·7 g., albumin 4·2 g., globulin 3·5 g. per 100 ml.

Throat swab: Feb. 14, no hæmolytic streptococci found.

Blood-count: Feb. 15, red cells 4,100,000 per c.mm. Hb 69% (10·8 g. per 100 ml.); colour-index 0·84; whit cells 7000 per c.mm. (neutrophils 62%, eosinophils 1% lymphocytes 29%, monocytes 8%).

Blood Wassermann reaction and Kahn test negative.

Electrocardiogram: March 13, P–R interval 0·22 sec.; n other abnormality.

Antistreptolysin titre unfortunately could not be estimate owing to technical difficulties.

DISCUSSION

In spite of the normal urine, it was difficult to mak any diagnosis other than acute glomerulonephritis in an illness developing three weeks after an upper respiratory infection and characterised by fever, generalised œdema and hypertension, all of which disappeared within a few days. We have found no account of a similar case published in England or North America, though we have heard through colleagues of at least 3 cases in the British Isles. Further cases have been described on the Continent. Fenini (1872) mentioned 6 cases of postscarlatinal nephritis without albuminuria, 3 being confirmed at necropsy. Litten (1882) had a similar case, and Henoch (1899) recalled 6, in which the diagnosis was apparently confirmed at necropsy and some of which did develop albuminuria in the last few days of life; he gave a detailed account of one of these cases.

All of these cases were postscarlatinal, and in none of them, of course, is the blood-pressure recorded. Nonnenbruch (1916), in reporting a case of trench nephritis, seems to have been the first to describe hypertension, as well as œdema, occurring without albuminuria He mentioned 2 other cases in which albuminuria appeared only after several days. Topfer (1917) claimed that in many cases of trench nephritis œdema wa present without albuminuria, but since most of these occurred among Russian prisoners-of-war the condition may have been hunger œdema. Mayer (1922) reviewed the published cases up to that time and added 2 uncon vincing ones, neither of which developed a significant rise in blood-pressure. Kylin (1922) observed severa patients with a transient rise in blood-pressure but no abnormality in the urine; he suggested that these might be cryptic cases of acute glomerulonephritis but gave no further clinical details. Wickbom (1928) reported 3 cases, only 1 of which showed a raised blood-pressure; in 2 of them red cells were present in the urine in spite of the absence of albumin. He also examined his patients' urine daily during a hospital epidemic of staphylococcal sore throat and found a moderate number of red cells in 7 out of 52 cases from four to nine days after the acute infection. In 6 of these, casts of an unspecified type were also present, but in none was there albuminuria. He boldly interpreted these findings as indicating minimal acute glomerulonephritis.

In Chile Alessandri and Roeschmann (1942) have described, among 248 cases of acute nephritis, 6 in which urinary signs were either absent or minimal and transient; 5 of these occurred from seven to ten days after tonsillitis or an acute skin infection. Definite hypertension was noted in 4 of the 6, and the blood-pressure reached the upper limits of normal in the remaining 2. One patient died from pulmonary œdema 10 minutes after an intravenous injection of ether, given to measure the circulation-time. Clinically, there had been well-marked peripheral œdema, and the blood-pressure rose to 160/110 mm. Hg, though no abnormality was found in the urine. At necropsy an intense acute glomerulonephritis was found.

We will not attempt to discuss the theoretical implication of these cases. None of the necropsy accounts describes the histology of the kidneys in detail, and there is no record of serial sections having been made. Without further data, any explanation would be speculative. It seems clear that an illness resembling acute glomerulonephritis but lacking urinary abnormality can occur. More records and fuller investigation of this illness are desirable.

SUMMARY

A girl of 16 developed transient hypertension and œdema consistent with a diagnosis of acute glomerular nephritis but no urinary abnormality was found except for doubtful albuminuria on one occasion.

The published examples of acute glomerulonephritis without albuminuria are briefly reviewed.

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> "... In brief, I hold that from the very beginning of human evolution the conduct of every local group was regulated by two codes of morality, distinguished by Herbert Spencer as the 'code of amity' and the 'code of enmity.' There were thus exposed to 'natural selection' two opposing aspects of man's mental nature.... How the neural basis of such qualities, both good and bad, came into existence during the progressive development of the human brain, we do not know, but it is clear that the chances of survival of a struggling, evolving group would be strengthened by both sets of qualities. These two sets of opposite qualities must be balanced to secure continuous, progressive evolutionary changes.... It will thus be seen that I look on the duality of human nature as an essential part of the machinery of human evolution. It is the corner-stone of my mosaic edifice. Human nature is both a product and a process. It has been built up as a product of man's evolution, but it has been developed so as to serve in the process of evolutionary change."—Sir ARTHUR KEITH, F.R.S., in a *New Theory of Human Evolution*, London, 1948.

EPIDEMIC OF BULLOUS ERYTHEMA ON LEGS DUE TO BED-BUGS

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IN June, 1947, a woman presented herself complaining of recurring blisters on her legs. The lesions had appeared at intervals for some months. A band of erythema was found across the back of both calves just above their maximal circumference. This erythematous zone was studded with bullæ varying in size up to that of a pigeon's egg. The lesions were considered to be most likely due to insect bites, but no history of duties at home or at work likely to expose the calves to attack in this manner was obtained. The question of a chemical burn was gone into, but this appeared very unlikely, and there had been no marks on the stockings. There was no possibility of a dermatitis striata bullosa pratensis.

A few days later a second patient appeared with exactly similar lesions—a zone of erythema studded with bullæ across the back of both calves at about the same level from the ground as in the first case. This patient was, however, more observant than the first; she said this was not the first attack she had had, and that the blisters always appeared a few hours after she had been in a tram-car on a certain route.

Within a fortnight some half-dozen further cases were seen, all exactly similar and all with a history of using the same tram route. All were women. A local practitioner telephoned to ask if I knew about the epidemic of blisters on ladies' calves, since he had had several cases. I told him to find out if his patients used this tram route, and he informed me later that they all did. News of further cases was also obtained from medical and non-medical sources, but the total number of women affected is not ascertainable.

Meantime the medical officer of health had been informed and the opinion given that a crawling insect was most likely to blame, not a "jumper" or a "flier," and that the trams on this route appeared to contain the culprits. At his request I inspected a tram-car similar to those used on this route and found that the seats on the lower deck (which was the one used by all the patients) consisted of two parallel leather-covered cushions running the length of the interior of the car. Each seat was kept in place by a vertical slat of wood running in front of the cushion. The lower edge of this slat of wood appeared to be the same height from the floor as the lesions, and, on sitting down and putting their feet as far back as possible, passengers would bring the calves of their legs into contact with the lower edge of the wood.

Representatives of the sanitary department thereupon inspected all the trams using the affected route. They were found to be free from infestation except for one car. In this vehicle the lower edges of the slats of wood were grooved, and these grooves were the habitat of numerous bed-bugs which evidently reversed their normal mode of life, lying hidden by night when the tram was in the garage and by day sitting in a row along the edge of the wood extracting nourishment from the legs of unsuspecting lady passengers. Men were never affected, their stouter nether garments providing sufficient protection.

The tram was disinfested, the grooves were planed out to prevent a recurrence, and the epidemic came to an abrupt stop. The interesting clinical point was the severity of the reaction to bed-bug bites. All cases seen and reported were frankly bullous.

Medical Societies

GENETICAL SOCIETY OF GREAT BRITAIN AND BRITISH EMPIRE CANCER CAMPAIGN

Genetics of Cancer

THESE two bodies held a joint symposium in London on June 24 and 25. On the first day the chair was taken by Mr. E. B. FORD, D.SC., F.R.S. and Mr. A. W. GREENWOOD, D.SC., and on the second by Prof. A. HADDOW, M.D. and Dr. CUTHBERT DUKES.

INHERITANCE OF CANCER IN ANIMALS

Dr. W. E. HESTON (Bethesda, U.S.A.) gave an account of work done at the National Cancer Institute showing the influence of hereditary factors on the production and transmission of the milk agent. This hereditary influence is shown by experiments on the offspring of matings between high and low cancer lines, whose children could be made to contain a variable quantity of high or low cancer nuclear material depending on whether they arose from back-crosses to the grand-parental strain with a high or low tumour incidence. Further experiments have been done using mice of a high cancer strain which had been deprived of the milk agent. These indicated that the milk factor accelerates genetic processes underlying tumour growth but is not active by itself.

Dr. R. KORTEWEG (Amsterdam), dealing with the influence of œstrogenic substances on tumour susceptibility, described experiments which have shown that the amount of hormone required to produce œstrus in spayed females of a high cancer strain is much higher than in low cancer strains. Excessive quantities of œstrone and possibly progesterone seem to be required in high cancer strains to produce physiological effects. Quantitative estimates of the relative sensitivity to œstrogens can be obtained by using the response of the mammary gland to find the least dose causing a physiological effect. Experiments have been confined to mice of the C57 and dba strains, the former having a low incidence of spontaneous tumours and the latter a high one. Males of the C57 strain have been shown to have a higher resistance to œstrone than females—an apparently contradictory finding since their incidence of mammary tumours is very low. This is apparently due to the antagonistic influence of male hormone. Dr. Korteweg suggested that the incidence of mammary tumours in high cancer lines is partly due to their excessive secretion of œstrogens, and consequently increased stimulation of the mammary gland.

Dr. L. DMOCHOWSKI (Leeds) showed that there are hereditary differences in the production of the milk agent. The differences in production could be demonstrated by an experiment in which it was shown that as mice grow older larger quantities of milk agent are required to initiate the development of mammary tumours. The amount of milk agent required in this experiment was found to vary according to the strain from which the extract was prepared, larger amounts being required from moderately high tumour strains than from very high tumour strains. Other experiments have indicated that there is a variation from strain to strain in the efficacy of sex hormones as factors in the causation of cancer.

Dr. P. A. GORER (London) outlined the history of tumour-transplantation studies. It was shown many years ago that the transplantability of a tumour is determined by complexes of dominant genes. Since then some of these genes have been found to determine the production of antigens which can be demonstrated serologically. Dr. Gorer suggested the term histo-compatibility antigen to describe these antigens. They can be found in all tissues, though it is easiest to work with red cells. Recent work has shown that the gene determining the production of one of the known antigens in mice is located on the same chromosome as the gene for Fused, an anomaly of the tail. The apparently high mutation-rate of the genes for histo-compatibility frequently makes transplanting between different sublines of the same pure line impossible. A high degree of polymorphism in relation to antigens may be desirable from an evolutionary point of view owing to the danger of fœtal/maternal incompatibility. The more antigens that a mother carries, the less likely is she to kill the fœtuses produced in mating at random with a variety of males. Such polymorphism has been found in some studies on the histo-compatibility antigens of wild mice. In some cases Dr. Gorer has found that a transplanted tumour may grow even in an antigenically incompatible host. This appears to be because in some cases the presence of a tumour depresses the antibody-producing powers of the host, a fact which is of some clinical interest.—During the discussion Dr. STRONG questioned the reality of the high mutation-rate suggested by Dr. Gorer. He has not noticed the same effect in his own mice and suggested that some of it can be accounted for by inadequate records or contamination in the breeding colony.

Dr. G. HOGREFFE (Copenhagen) described experiments on the genetics of leukæmia. The Aka strain of mice have an extremely high spontaneous incidence of this disease. When this line is out-crossed to another with a negligible incidence it is found that the frequency of leukæmia in the F_2 and back-cross experiments can be explained on the hypothesis that the disease is determined by the segregation of a single Mendelian factor. The results are complicated by the fact that in hybrids the age of incidence is greatly increased over that in the original Aka mice. Subsequent experiments on the transplantability of the leukæmia have shown that this process is far more complex in its determination than is the hereditary transmission of the disease.

Dr. C. C. SPICER (London) gave an account of a statistical approach to the problem of assessing the tumour susceptibility of pure lines. The simple percentage of tumour deaths is not adequate for this purpose as it is liable to be greatly altered by differences in the non-tumour death-rate, though the true tumour-susceptibility is unaltered. Application of this method to some existing data has given results diametrically opposed to those which would be deduced simply from the percentage of cancer deaths.—In the discussion Prof. J. B. S. HALDANE, F.R.S., who initiated the work, emphasised that the method can only be used on homogeneous material. Sharply heterogeneous data, such as that arising in an F_2 generation, cannot be treated by the same technique.

VIRUS- AND CARCINOGEN-INDUCED MUTATIONS

Dr. L. C. STRONG (Yale) gave a historical summary of work bearing on the possibility that cancer arises as a somatic or germinal mutation. In this connexion he defined mutation as the occurrence of an inheritable novelty passed on in all subsequent cell divisions. Germinal mutations are well known and the occurrence of somatic mutations has also been noted—for instance, in plants where some branches may show a different genetic structure from others on the same plant. In one case two tumours growing in the same mouse were found to have genes determining their transplantability although they were histologically identical. In recent years Dr. Strong has produced mutations in mice with methylcholanthrene by founding a line of animals selected for resistance to tumour formation at the site of injection of the carcinogen. A great variety of tumours have been produced by this method, including stomach and breast cancers histologically very similar to those in man. These tumours are inherited and appear to be due to germinal mutations. The sex-incidence of gastric cancer is similar to that in human beings. Somatic mutations as well as disturbances of growth and development have been produced by methylcholanthrene. This substance does not act purely as a carcinogen but apparently as a mutagen also. Dr. Strong mentioned the different effects on the nucleus that carcinogenic agents can have—for example, X rays and the nitrogen mustards produce chromosome breaks, whereas the classical carcinogens as a rule do not do this.

Dr. N. DEMEREC (Washington, U.S.A.) described his experiments on the production of mutations in *Drosophila melanogaster* by carcinogens. The technical difficulties in administering the carcinogens have been overcome by using aerosols of solutions containing the substance under test. A semi-automatic experimental technique has been devised by which controlled dosages can be given over a long period. The experimental results have shown that not all carcinogens can cause mutations since some quite powerful ones have not increased the mutation-rate. An interesting discovery arising from the work is that the mutation-rate can be controlled by a gene.—Dr. C. AUERBACH in the discussion suggested that the gene controls penetration of the carcinogen rather than the actual mutation-rate, but Dr. Demerec replied that experiments have indicated that this is not the case. Dr. Demerec remarked that if cancer is due to somatic or germinal mutation there seems to be little possibility of its prevention or control.

Mr. C. D. DARLINGTON, D.SC., F.R.S. (London) suggested that a continuous gradation exists in the hereditary mechanism from the transmission of plastid, which has apparently always been part of the cytoplasm, through the killer factor discovered by Sonneborn in paramecium, to viruses such as those causing Shope papilloma or contagious warts, which are believed to arise outside the cell and are regarded as infective organisms. The case of killer represents an intermediate stage, since it can be passed from one organism to the other in prolonged copulation, though this is not usual and it is normally passed on in cell division as a cytoplasmic inclusion. The killer factor has also been shown to be under genetic control.—In the discussion Dr. DEMEREC said that recent work has suggested that the killer factor is a parasite rather than a virus or a plasmagene.

Prof. P. B. MEDAWAR, D.SC., (Birmingham) gave an account of work which has shown that cells tend to breed true to type. For instance, the typical behaviour of cells from the sole of the foot is carried on when they were transplanted to the chest wall, and similar results have been obtained with claws and with cornea. He described the infective transformation of pigment cells in the guinea-pig. These are dendritic cells, some of which contain melanin while some do not. When a dendrite of a pigmented cell makes contact with a non-pigmented cell of the same species, then this cell becomes able to produce melanin and hence becomes pigmented.—In the discussion Dr. GEORGIANA BONSER suggested that the appearance of satellite melanomata may be accounted for in this way, and also that amelanotic melanomata may arise because the rate of growth of cells outstrips the rate of the infective process of pigmentation.

Prof. A. HADDOW (London) reviewed the work bearing on the relation of carcinogens and virus investigations of the origin of cancer. He contrasted the two kinds of agent. The carcinogens are of many different kinds but are usually of low molecular weight, not very specific in their effects, and not necessary to continued growth once a tumour has been induced. Viruses, on the other hand, are complex proteinoid substances very highly specific in their effects and necessary to continued growth of the tumour. The link between these two fundamentally different agents may be found in the influence of the carcinogen on some pre-existing cytoplasmic body analogous to a virus, either directly or through the nucleus.

Dr. J. G. CARR (London) described his experiments on the production of mutations in mice by carcinogens. He has used the descendants of a cross between members of an inbred high-tumour line and a stock of loosely inbred laboratory mice. The number of mutations observed has greatly exceeded what would be expected from spontaneous mutation.—Dr. E. B. FORD pointed out in the discussion that no controls were used. Dr. Carr suggested that there is some specificity in the action of carcinogens as mutagens, some loci being more mutable than others. Under these circumstances the offspring of parents exposed to the same carcinogen in industry may be expected to be carrying similar mutant genes, so that intermarriage among the children of similarly occupied parents may lead to some of the ill effects of inbreeding among relatives. This point was questioned by Professor HALDANE on statistical grounds and also by Dr. DEMEREC, who has found no specificity in the mutagenic action of carcinogens.

Prof. R. D. PASSEY (Leeds) described his electron microscope studies on the milk factor for tumour induction in mice. This work is still incomplete because only temporary access to the electron microscope has been possible. Once the technical problem of obtaining satisfactory defatted specimens of milk was solved, particles of fairly constant size (about 200–300 Å) were demonstrated in the milk of mice from high-tumour lines. Similar particles were absent or very scarce in the milk of mice from low-tumour lines. Further work is in progress to determine more precisely whether these particles are identical with the milk factor. At present it is not possible to assert this or even that the particles are viruses.

Dr. A. W. GREENWOOD (Edinburgh) discussed some work on the inheritance of susceptibility to the Rous sarcoma in fowls. This showed that both susceptibility and resistance to the tumour can be inherited, though in neither case can the heredity be explained on a simple Mendelian hypothesis. Attempts to develop a susceptible line of animals were discontinued owing to the war, but a resistant line has been successfully established by selection.

Dr. R. G. GOTTSCHALK (Liège) dealt with the relative susceptibility to carcinogens of adult and embryonic tissues. He pointed out that many writers have suggested that the embryonic state implies a special liability to cancer. His experiments have shown that, as judged by growth-rate of induced tumours and histological criteria, there is no difference in the liability of adult or embryo epidermis, though both are more susceptible than connective tissue.

INHERITANCE OF CANCER IN MAN

Prof. TAGE KEMP (Copenhagen) spoke of the work of the University Institute of Human Genetics at Copenhagen. Two major studies have been produced, one by Jacobsen on breast cancer and one by Videbaek on leukæmia. Jacobsen investigated the family history of 200 patients with breast cancer, and of 200 controls of the same age and class. He found that there is a hereditary disposition to breast cancer, possibly accompanied by a general susceptibility to all cancer. He also found that people with a family history of breast cancer tend to develop cancer at an earlier age than those who have no such history. Videbaek showed that there is no clear-cut hereditary predisposition to leukæmia although there is an excess of cancer over expectation in the families of leukæmic patients.

Mr. P. C. KOLLER, D.SC. (London) described two cases of xeroderma pigmentosum, a disease of the skin in which cancer sometimes develops. The inheritance of this disease has been explained by Haldane on the basis of partial sex-linkage, though the pedigrees shown by Dr. Koller did not support this suggestion very strongly. —In the discussion Professor HALDANE pointed out that Dr. Koller's two cases were not sufficient evidence to prove or disprove the partial sex-linkage of xeroderma.

Dr. T. BUSK (Copenhagen) gave an account of the studies carried out by the Danish Cancer Registry on cancer in twins. These have shown no excess of cancer in the other members of pairs of twins when one is suffering from cancer. This is true of both monozygotic and dizygotic twins. There is however a strongly marked correlation in the site of localisation of cancer, when it does occur.

Prof. D. W. SMITHERS, M.D. (London) has collected family histories of a large number of cases of breast cancer. They show a very strong familial tendency to breast cancer, though in distinction to the findings of the Danish workers he has found no signs that people with a family history of breast cancer tend to develop it younger than those without a family history.

Prof. L. S. PENROSE (London) has been collecting family histories of breast-cancer patients admitted to University College Hospital. The problem of a control group has been solved by using the Registrar-General's statistics, from which it is possible to calculate an expected proportion of breast cancer and cancer deaths among relatives dying at all ages and at most periods of the immediate past. In this way the expected number of cancer deaths and cases of breast cancer can be calculated for the relatives and compared with the observed figures. This work has shown that there is not an excessive amount of cancer as a whole among the relatives of breast-cancer patients, though there is a considerable excess of breast cancer among their mothers and sisters. There is no indication that the relatives of breast-cancer victims themselves develop the disease at younger ages. A secondary investigation has been made to discover whether anything analogous to the milk factor of mice can be found in man, by comparing the incidence of cancer in breast-fed and non-breast-fed children. No significant excess among the breast-fed has been found.—In the discussion Professor SMITHERS remarked on the extreme practical difficulty of obtaining reliable information as to whether a patient was breast-fed or not; almost all were breast-fed for at least a short time.—Professor PASSEY mentioned an investigation into the inheritance of breast cancer now in progress at Leeds; the work is still incomplete but the results differ from those of Professor Penrose in some respects.

Reviews of Books

Hallmarks of Mankind

FREDERICK WOOD JONES, D.SC., M.B., F.R.C.S., F.R.S., Sir William Collins professor of human and comparative anatomy, Royal College of Surgeons of England. London: Baillière. 1948. Pp. 86. *10s. 6d.*

ZOOLOGICALLY, it has for many years been generally accepted that man is one of the higher primates and that, on the usual morphological criteria employed for assessing taxonomic affinities, his closest relationships are evidently with the anthropoid apes. Yet it is obvious that in a number of anatomical features (such as the complexity of the brain, the form and disposition of the teeth, the construction of the foot, and the proportions of the limbs) man contrasts rather strongly with the apes. Prof. Wood Jones makes an interesting attempt to ascertain just how far some of these distinctively human features are really fundamental and how far they may be taken to indicate a relatively long independence of the human line of evolution. He lists a series of characters which from time to time have been advanced as distinctive of the human family, and emphasises their possible significance as indirect evidence of human phylogenesis. It will be apparent to the reader, however, that many of these features are by no means as distinctive of man as some authorities have supposed. For example, he points out that the sphenoparietal contact of the human skull, though very rare in the gorilla and chimpanzee, is the normal condition in the Asiatic apes and many types of monkeys. Multiple pyramids in the kidney are also to be found in the gorilla and chimpanzee as well as in man. The human pattern of origin of the large arteries from the aortic arch is also found in 90% of gorillas. Although this type of evidence in itself is thus bound to be inconclusive (for the details of human evolution will only be finally established by the fossil record), nevertheless it provides a broad basis for speculative inquiry and at least indicates possibilities or probabilities.

As usual, Prof. Wood Jones writes in an attractive and animated style, and his trenchant criticisms of some views which are now fairly widely accepted make lively reading. But in developing some of his arguments for the anatomical uniqueness of man he shows a tendency, by quoting isolated sentences out of their proper context, to caricature the opinions of his fellow anatomists. They will find themselves in good company, however, for both Charles Darwin and T. H. Huxley are vigorously censured for their mistaken ideas.

The Postnatal Development of the Human Cerebral Cortex

Vol. III. The Cortex of the Three-month Infant. J. LEROY CONEL, professor of anatomy, Boston University. Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1947. Pp. 158. 70*s.*

THE first two volumes, published in 1939 and 1941, described the development of the infant's cortex at birth and at one month. Now, at three months, the infant is just at the end of the inhibitory phase of the grasp reflex; he can converge his eyes on stationary and moving objects, and can make purposeful movements of the arms. Control of function is just beginning in the hands. All the histological criteria used in the analysis of the cytology of the cortex in this study agree in indicating that the region of the brain, FAγ, controlling muscular function in the upper trunk, arm, and forearm, is more advanced than elsewhere. The visual cortex, too, is sufficiently developed to suggest that some cortical vision is possible. Function in the acoustic area of the cortex may also be beginning, but is evidently slight according to histological criteria.

Histologists will be reassured to find that the Nissl bodies and neurofibrils are vindicated afresh as significant cytoplasmic furniture, and not artefacts. Along with other evidence of approaching maturity their evolution is traced by Conel from the earliest stages in different parts of the cortex, and they reach their highest point of development in this age-period in the motor area FAγ. The study is based on a standardised investigation of six normal brains, the technique and presentation conforming with those of the earlier age-groups. The plates again call for special commendation, and it is a pleasure to note that Miss Etta Piotti is still producing beautiful drawings of the neurones from Cox-Golgi preparations.

The Pathology of Nutritional Disease

RICHARD H. FOLLIS, Jr., M.D., associate professor of pathology, Duke University, Durham, North Carolina. Oxford: *Blackwell Scientific Publications.* 1948. Pp. 291 35*s.*

IN Professor Follis's own words, this book was written "to gather together the available information which deals with the physiological and morphological changes, occurring naturally or produced experimentally, which accompany deficiencies of one or more of the 40-odd nutrients now known to be essential." In a way he has succeeded in his task, for he has produced a fair-sized book with nearly 800 references. All the same, it is remarkable how little the histological and morphological changes seem to have been studied. Over and over again he has to record the absence of any work on a subject, and if the book merely draws attention to our ignorance it will have served a useful purpose. It contains chapters on the inorganic elements, essential amino-acids, fat-soluble and water-soluble vitamins, and the essential fatty acids, and it may be recommended to anyone wishing to look up the effect of a deficiency of any of these on the mammalia (he has excluded birds, bacteria, and invertebrates from his investigations). Unfortunately, however, the book is an uninspired production, with some curious lacunæ. Nothing is said, for example, about calories; though these are surely as important as inositol. Rather too much prominence is given to the writings of investigators with whom the author has collaborated, and there are very few references to the German, French, Italian, Swiss, Dutch, or Spanish work: readers must not expect a review of the international literature. But the book is well printed and there are over 70 beautifully reproduced photographs and photomicrographs. The sections on vitamins A, D, and C are particularly well illustrated.

La radiothérapie anti-inflammatoire

JEAN HUGUET, electro-radiologiste des hôpitaux de Marseille. Paris: Doin. 1947. Pp. 200. Fr. 440.

Dr. Huguet divides his account of the use of radiotherapy for the treatment of inflammatory diseases into three parts—a first period during which a tentative approach produced some good results but also some disasters, a second period during which the scientific basis was sound and a third the contemporary period of accurate dosage and physiopathological study. The conditions for which radiotherapy may be beneficial are described at length, and it is interesting to see how many and how varied are the lesions which have responded to different methods of treatment. The last two chapters are the most important; here the *mode of action of irradiation* is discussed and it is concluded that small doses act on the sensitive lymphoid and reticulo-endothelial hæmopoietic tissues; that the threshold of sensitivity is very low; and that the margin of safe dosage is very narrow before the point is reached where increased dosage does harm. Dose must, therefore, be low; and the more acute the condition the lower the dose. Treatment should not be repeated within 48 hours; and, if it is continued, doses should be increased together with the interval between treatments.

THE LANCET

LONDON: SATURDAY, JULY 10, 1948

Gamma-globulin in Measles

ANTIBODIES, as has long been known, reside mostly in the globulin fraction of the blood. Modern methods of fractionating the plasma proteins, as by electrophoresis and ultracentrifugation, have shown that the antibody is concentrated particularly in the gamma-globulin which constitutes about 11% of the total protein. When, early in the war, E. J. COHN and his colleagues at Harvard undertook the large-scale fractionation of human plasma by alcohol precipitation in the cold, with the primary object of supplying albumin for combating shock, they naturally used the same methods to separate the other protein moieties like fibrinogen and the globulins. Eventually, a viscous substance called fraction II, containing about 16% protein as practically pure gamma-globulin and with the natural antibodies concentrated 20- to 30-fold, was submitted to clinical trial. Whole blood, normal adult serum, and convalescent serum have all been used with varying success in the prevention or attenuation of measles, and the new gamma-globulin was therefore first tried in this infection. The results were astonishingly good; not only was the disease prevented or attenuated by small doses given early in the incubation period, but it was even claimed that the rash could be aborted when larger doses were given in the prodromal stage of infection.

The method of fractionation elaborated by the Harvard workers, involving such variables as pH, salt concentration, protein concentration, and the use of alcoholic solvents at a temperature range of 0 to − 10°C, could not readily be used extensively in Britain during the war. When, therefore, a gift of a litre of gamma-globulin was received from America in 1943, a small working party under the chairmanship of Sir PERCIVAL HARTLEY was set up to organise carefully controlled trials with the precious material. Their results are reported at the front of this issue. It was known from earlier experience, particularly in the London County Council fever service, that convalescent measles serum would protect a high proportion of contact children, aged 6 months to 5 years, if given in doses of 5–10 ml. within five to six days of exposure to measles; so this first batch of gamma-globulin was used in a comparative trial with convalescent measles serum on groups of susceptible children intimately exposed to infection in hospital, in day or residential nurseries, or in their own homes. The results in 139 children given gamma-globulin and a comparable group of 136 children given convalescent serum showed that the concentrated globulin was about twice as potent as the convalescent serum. Thus, in the most susceptible age-group of children aged 1–4 years, only 2 out of 28 given 2·5–3·5 ml. of globulin developed (mild) measles, compared with 7 out of 33 children given 5 ml. or more of convalescent serum. In contrast with earlier experience with placental globulins, there were no local or systemic reactions although the viscous solution had to be injected with a needle of fairly wide bore.

With the demonstration that gamma-globulin was both safe and effective, subsequent trials with fresh supplies received from America were devised to assay appropriate dosage for prevention or attenuation, to compare the potency of different batches, and to assess the keeping qualities of the antibody in liquid solution. When a dose of 0·1 ml. per lb. body-weight was used, a protection-rate of 92·6% was obtained from the sum of 13 different batches of globulins; 4 of the 5 unprotected children in this group developed mild measles. While the figures are too small to allow comparison of the potencies of different batches, there was at least one batch of low-potency globulin (omitted from the analysis above) which protected only 16 out of 28 children in the standard dosage of 0·1 ml. per lb. body-weight. Whatever was the cause of this deficiency, it seems unlikely, in a highly urbanised community where 80–90% of children develop measles, that concentrated globulin from pools of adult serum will vary much in their content of measles antibody. When attenuation rather than protection is desired, the American workers have recommended a quarter of the protecting dose, but the present study and experience with convalescent serum suggest that about half the standard dose should be used. Potency seemed to be maintained fairly well in the liquid preparation kept in cold storage for two years or more, though it should be noted that in the highly susceptible age-group of 1–4 years, 22 out of 110 children given "protective" doses of the outdated globulin developed measles. It would be wise, therefore, to freeze-dry batches of globulin that may have to be kept for some time before use.

Measles is not the killing disease it was even as late as twenty years ago, but it may still be a serious infection in young children and lead to crippling complications like otitis media and bronchopneumonia. Most doctors would therefore prefer to abort or attenuate the attack in susceptible children of 6 months to 3 years of age known to be exposed to infection. The supply of convalescent serum is always very limited; normal adult serum may modify but not usually prevent an attack unless given in large doses, and there is the small risk of homologous serum hepatitis. Concentrated globulin in amounts of 2–3 ml. will either give temporary protection or will so modify the attack that the risk to the child is minimal. And there has been no recorded instance of homologous serum hepatitis after many thousand injections of gamma-globulin. The main problem facing us is the large-scale supply of this commodity. The raw material will probably be obtainable in sufficient amount through the National Blood Transfusion Service. A method of concentrating the antibody-containing globulins, using precipitation with ether instead of alcohol, has been developed by

KEKWICK and his colleagues [1] at the Lister Institute, and already experimental batches of this globulin are being tested in controlled clinical trials with encouraging results. Meanwhile, until supplies become more generally available, normal adult serum, which is distributed by the Public Health Laboratory Service, may be used in doses of 5–10 ml. to modify the attack in young children.

There are other uses for gamma-globulin. It has already proved effective in the prophylaxis of infective hepatitis, and has even had some success against upper respiratory infections.[2] Like other preparations, it has failed to abort the paralytic stage of poliomyelitis and has given negative results in the control of chicken pox and mumps. Here it may be necessary to prepare a concentrated globulin from pools of convalescent serum; in one study [3] such a globulin apparently reduced the incidence of orchitis when given in doses of 20 ml. after the onset of mumps in young adults. We do not yet know whether it will protect the pregnant woman against rubella; but we can fairly hope that this substance, originally almost a waste product, will prove an effective new weapon against the still intractable virus infections.

A Tax on Knowledge

FROM time to time attention is drawn to the discouraging attitude of our income-tax law towards such professional expenses as the purchase of textbooks and scientific journals and subscriptions to societies. A correspondent serving in the Forces complains that no rebate is allowed him in his efforts to use these means of keeping abreast of current medical knowledge on a fixed salary. He suggests that a medical man in the Services is in this respect denied privileges which civilian doctors enjoy. But subject to the mysterious distinctions discoverable in the expense rules under schedules D and E, it does not appear that civilians obtain much greater advantage from the Inland Revenue than doctors serving in the Navy, Army, or Air Force.

The material passage for the latter seems to be found in schedule E, which charges tax "in respect of every public office or employment of profit." Rule 9 of this schedule allows a deduction of expenses "necessarily incurred and defrayed" in travelling in the performance of the duties of the office or employment or" (a pleasant old-world touch) "keeping and maintaining a horse to enable him to perform the same," or otherwise spending money "*wholly, exclusively, and necessarily in the performance of the said duties*" No-one, of course, expects the Inland Revenue to be soft-hearted in applying these words which we have italicised. An air pilot was not allowed to deduct the cost of a telephone to his house. The nearest case for our present purpose is Simpson *v.* Tate where in 1925 Mr. Justice ROWLATT held that a county medical officer was not entitled to deduct the cost of subscriptions to medical and other professional societies. "I think," said the learned judge, "that all subscriptions to professional societies and all taking in of professional literature and all that sort of expense which enables a man to keep himself fit for what he is doing are things which can none of them be allowed. If they were allowed, every professional man would say: 'I have to belong to this and I have to belong to that society; I have to take in this publication and I have to take in that publication, and to do all sorts of things,' and there would be no end to it. I think the principle is quite clear; nothing of that sort can be allowed." The latest edition of Judge KONSTAM's *Law of Income Tax* observes that this decision seems doubtful. It was followed nevertheless in 1945 in Blackwell *v.* Mills where there had been a condition in an employee's contract of service that he should attend classes at the Chelsea Polytechnic; the expense of the classes was not allowed as a deduction. One other case is worth noting—Wales *v.* Graham, in 1941. Here the taxpayer, a divisional engineer employed by the London County Council, sought to deduct the cost of his subscription to the Institution of Civil Engineers. Candidates for the post of divisional engineer had to be corporate members of the institution or to hold qualifications approved as equivalent. It was not specifically required that membership of the institution should be continued after the candidate was appointed, but there was substantial evidence that relinquishment of membership would make impossible the continued efficient discharge of the full duties of the office. The Crown argued that the subscription to the institution was not money expended wholly, exclusively, and necessarily in the performance of the taxpayer's duties: it was not enough to show that it was "necessarily" incurred to secure or retain the appointment or to obtain promotion in the service The court refused to allow the deduction.

Private practitioners are assessed, of course, under schedule D of the Income Tax Act and not under schedule E. This seems to permit a slightly more generous attitude. Where schedule E speaks of sums "wholly, exclusively, and necessarily expended in the performance of the duties of the office or employment," schedule D speaks of sums "wholly and exclusively laid out or expended for the purposes of the trade or profession." Significance is attached to the word "necessarily" in schedule E and to the words "purposes of the profession" in schedule D There seems no reason why the expense rules should be more niggardly in the one case than in the other Practitioners in medicine and surgery who serve in H.M. Forces are not unreasonable in thinking themselves at some disadvantage in their efforts to keep abreast of current developments. Their anxiety to give of their best should not be taxable.

Among the expenses "necessarily and reasonably incurred" by specialists "in the course of their work," the last Spens Committee includes "the cost of books and journals, preparation of scientific papers, and subscriptions to professional societies" and it presumes that the Inland Revenue authorities "would be prepared to consider favourably as legitimate allowances for income-tax purposes any items of expense which had been approved by a public hospital authority." We hope that the Minister of Health may indeed be able to persuade the Treasury to take this wise view.

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Leptospirosis Canicolaris

CANICOLA fever (leptospirosis canicolaris) in man provides some puzzles for both the clinician and the epidemiologist. The organism, *Leptospira canicola*, primarily infects dogs, and in all countries where serological surveys have been made a considerable proportion of the canine population shows evidence of past infection. STUART[1] obtained 40% of positive reactors among street dogs in Glasgow, and BROOM and MACINTYRE[2] found 26% of positives among dogs from different parts of England. In spite of this high proportion of infection among dogs, only 100 human cases have been diagnosed during the fourteen years since *L. canicola* was first isolated from dogs and man by DHONT and others.[3] The distribution of these cases was listed by Dr. MINKENHOF in his paper last week, and it is noteworthy that, though the disease has been reported from many parts of the world, no less than 61 of the records come from Holland and Denmark. The work of SCHÜFFNER and his co-workers has led to a general awareness of leptospirosis in Holland, and all sera sent to the State Serum Institute in Copenhagen for Widal tests are also examined for leptospira agglutination.[4] It may be therefore that the figures for these countries give the best indication of the general prevalence of the disease. If so, a large number of cases go unrecognised elsewhere.

So far as is known, *L. canicola* is not carried by rodents, like other leptospiræ; so dogs are the only important source of infection. The disease in dogs has not yet been fully elucidated, but nephritis is usually the outstanding feature. If the dog recovers, leptospiræ continue to be shed in the urine for a variable period, generally a few months but occasionally a year or more. Direct transfer of leptospiræ by infected urine is probably the common method of spread among dogs, and also from dog to man. This is well illustrated by the cases described by Roos et al.[5] and by SENTHILLE et al.[6] In each of these instances a bitch and her puppies were excreting leptospiræ, and canicola fever developed in their owners and also in people who received puppies. It is possible to trace the source of infection by laboratory tests in many cases, but not in all. In the case described by BABER and STUART[7] the patient had had no apparent contact with dogs, and these workers consider the possibility of infection while bathing. This is of course a well-recognised means of contracting Weil's disease. Rivers, ponds, and especially stagnant water are contaminated by rat urine containing *L. icterohæmorrhagiæ*, and the organisms probably gain access to man through the conjunctiva or tonsils.[8] In Holland VAN THIEL[9] found that *L. icterohæmorrhagiæ* could retain its virulence for at least twenty-two days in muddy water, and he suggested that canicola fever also might be contracted in water fouled by dogs which were excreting *L. canicola*. WINSSER[10] thinks that dogs too sometimes become infected through contaminated water, because a history of direct contact could not be established in some of his canine cases. Little is known about the capacity of *L. canicola* to infect man. Rodents and other small laboratory animals, however, are highly resistant; guineapigs generally show merely a transient infection, and the hamster (*Crycetus auratus*) is the only animal in which fatal leptospirosis occurs consistently. These findings, together with the considerable chance of contact with infection which the close dog-man association must entail, suggest that the pathogenicity of *L. canicola* is in fact low for humans, but much more information is required on this question.

Canicola fever is classed among the benign leptospiroses, and only one fatal human case has been described.[11] The clinical signs and symptoms are very variable. WALCH-SORGDRAGER[12] drew attention to the relative frequency of meningeal signs, and further experience has confirmed her observation. As a rule the onset is abrupt with fever, vomiting, muscular pains, intractable headache, and some stiffness of the neck. The patients are often admitted to hospital with a diagnosis of poliomyelitis or serous meningitis. A variety of eye signs may appear during the illness—conjunctival or ciliary congestion, photophobia, mistiness of vision, blurring of the optic disc, and optic perineuritis. SNAPPER et al.[13] noted the development of vitreous opacities in one patient eight months after recovery. Similar eye signs arise in meningitis due to *L. icterohæmorrhagiæ*.[8] Abdominal pain and vomiting are common in canicola fever, and the liver and spleen are occasionally enlarged, but jaundice has been recorded in only 6 cases. Rashes of various types are described, and a few cases have had epistaxis, but severe hæmorrhages such as occur in Weil's disease are seldom seen. Acute nephritis is typical of the disease in dogs, but it has been recorded only a few times in man—for example, in the severe case reported by MEYER et al.[14] where both jaundice and nephritis were well-marked. In most of the reported cases the urine has contained albumin with erythrocytes, leucocytes, and casts, but only for a short period, and the blood-urea has been within, or slightly above, normal limits. When more cases are brought to light it may be found that, as in Weil's disease, the symptoms are either mainly meningeal or mainly hepatorenal in origin. In meningeal cases the protein content of the cerebrospinal fluid is raised. Either segmented or mononuclear cells may predominate. The number of cells may be normal in the early stage and increase later, as in the case described by Dr. LAURENT in the symposium published in this issue; or the rise may occur in the first few days as in Dr. NORRIS's first patient. The variability of the symptoms makes clinical diagnosis difficult, and in the past a correct decision has not usually been reached until the later stages of the disease. When a rash is present syphilis, the exanthemata, and various skin diseases

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1. Stuart, R. D. *Vet. Rec.* 1946, 58, 131.
2. Broom, J. C., MacIntyre, A. B. Unpublished results.
3. Dhont, C. M., Klarenbeek, A., Schüffner, W. A. P., Voet, J. *Ned. Tijdschr. Geneesk.* 1934, 78, 5197.
4. Brammer, E., Petersen, C. B., Scheel-Thomsen, A. *Ugeskr. Laeg.* 1938, 100, 419.
5. Roos, C. J., Walch-Sorgdrager, B., Schüffner, W. A. P. *Ned. Tijdschr. Geneesk.* 1937, 81, 3324.
6. Senthille, F., de Boys, P., Kolochine-Erber, B. *Rev. Path. comp.* 1946, 46, 161.
7. Baber, M. D., Stuart, R. D. *Lancet*, 1946, ii, 594.
8. Buzzard, E. M., Wylie, J. A. H. *Ibid*, 1947, ii, 417.
9. van Thiel, P. H. *Ned. Tijdschr. Geneesk.* 1937, 81, 6106.
10. Winsser, J. *Z. InfektKr. Haustiere.* 1943, 50, 103.
11. Ruys, A. Ch. (1947) quoted by van Thiel, P. H. The Leptospiroses. Leiden, 1948.
12. Walch-Sorgdrager, B. *Bull. Hlth Org. L.o.N.* 1939, 8, 143.
13. Snapper, I., Chung, H. L., Chu, L., Chen, K. *Chin. med. J.* 1940, 58, 408.
14. Meyer, K. F., Eddie, B., Anderson-Stewart, B. *Proc. Soc. exp. Biol., N.Y.* 1938, 38, 17.

KEKWICK and his colleagues[1] at the Lister Institute, and already experimental batches of this globulin are being tested in controlled clinical trials with encouraging results. Meanwhile, until supplies become more generally available, normal adult serum, which is distributed by the Public Health Laboratory Service, may be used in doses of 5–10 ml. to modify the attack in young children.

There are other uses for gamma-globulin. It has already proved effective in the prophylaxis of infective hepatitis, and has even had some success against upper respiratory infections.[2] Like other preparations, it has failed to abort the paralytic stage of poliomyelitis and has given negative results in the control of chicken pox and mumps. Here it may be necessary to prepare a concentrated globulin from pools of convalescent serum; in one study[3] such a globulin apparently reduced the incidence of orchitis when given in doses of 20 ml. after the onset of mumps in young adults. We do not yet know whether it will protect the pregnant woman against rubella; but we can fairly hope that this substance, originally almost a waste product, will prove an effective new weapon against the still intractable virus infections.

A Tax on Knowledge

FROM time to time attention is drawn to the discouraging attitude of our income-tax law towards such professional expenses as the purchase of textbooks and scientific journals and subscriptions to societies. A correspondent serving in the Forces complains that no rebate is allowed him in his efforts to use these means of keeping abreast of current medical knowledge on a fixed salary. He suggests that a medical man in the Services is in this respect denied privileges which civilian doctors enjoy. But subject to the mysterious distinctions discoverable in the expense rules under schedules D and E, it does not appear that civilians obtain much greater advantage from the Inland Revenue than doctors serving in the Navy, Army, or Air Force.

The material passage for the latter seems to be found in schedule E, which charges tax "in respect of every public office or employment of profit." Rule 9 of this schedule allows a deduction of expenses "necessarily incurred and defrayed" in travelling in the performance of the duties of the office or employment or" (a pleasant old-world touch) "keeping and maintaining a horse to enable him to perform the same," or otherwise spending money "*wholly, exclusively, and necessarily in the performance of the said duties.*" No-one, of course, expects the Inland Revenue to be soft-hearted in applying these words which we have italicised. An air pilot was not allowed to deduct the cost of a telephone to his house. The nearest case for our present purpose is Simpson *v.* Tate where in 1925 Mr. Justice ROWLATT held that a county medical officer was not entitled to deduct the cost of subscriptions to medical and other professional societies. "I think," said the learned judge, "that all subscriptions to professional societies and all taking in of professional literature and all that sort of expense which enables a man to keep himself fit for what he is doing are things which can none of them be allowed. If they were allowed, every professional man would say: 'I have to belong to this and I have to belong to that society; I have to take in this publication and I have to take in that publication, and to do all sorts of things,' and there would be no end to it. I think the principle is quite clear; nothing of that sort can be allowed." The latest edition of Judge KONSTAM's *Law of Income Tax* observes that this decision seems doubtful. It was followed nevertheless in 1945 in Blackwell *v.* Mills where there had been a condition in an employee's contract of service that he should attend classes at the Chelsea Polytechnic; the expense of the classes was not allowed as a deduction. One other case is worth noting—Wales *v.* Graham, in 1941. Here the taxpayer, a divisional engineer employed by the London County Council, sought to deduct the cost of his subscription to the Institution of Civil Engineers. Candidates for the post of divisional engineer had to

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1. Kekwick, R. A., Record, B. R., Mackay, M. E. *Nature, Lond.* 1946, 157, 629. Kekwick, R. A. *Proc. R. Soc. Med.* 1947–48, 41, 217.
2. Adams, J. M., Smith, H. *Proc. Soc. exp. Biol., N.Y.* 1946, 63, 446.
3. Gellis, S. S., McGuinness, A. C., Peters, M. *Amer. J. med. Sci.* 1945, 210, 661.

evidence against the day in the late 'sixties when the country was ready for the next step—a Royal Commission.

Then there was Mr. Beaumont of East Bridgford, in Nottinghamshire, who insisted on giving evidence to the commission. Pollution of the Trent by Nottingham, higher up the river, had brought fever to his village; and when he had read up "everything in the way of Acts of Parliament and handy books to get up the question" he had found them unintelligible. The cholera epidemic of 1866 contributed its share to the change of temper. The feminist movement turned slumming ladies into practical social workers, and Mrs. Baines, addressing the Manchester Statistical Society, foreshadowed the great body of women social workers on which our modern public-health service is largely based, when she said: "If the women of England could be so persuaded, we might raise up a whole army of women workers in this hitherto neglected field." Public imagination was stirred in another way when, in the famous five-case outbreak, typhoid struck the Prince of Wales, an earl, a butler, an indoor servant, and a stable-boy. In this social hierarchy, the butler and the indoor servant suffered lightly, the earl and the stable-boy perished, and the Prince was in danger of death.

The result of all was an Act of which no one thought much at the time—a patchwork, workaday Act, to amend and consolidate existing sanitary law, passed quickly in a defeatist mood at two consecutive sittings between tea and dinner, with the Derby in between. Yet, says the report, "it would be difficult to pick out any piece of defunct legislation and say that it had been in its day a better and more faithful social servant than the Public Health Act, 1875." Its successors in 1906 and 1925, the Ministry of Health Act, 1919, and the Local Government Act, 1929, have all been part of a piecemeal development along the same lines, giving us "good services but a bad service."[2] Now, in 1948, the temper of the times demands a fresh grouping. What seems a tidal wave to us is perhaps after all no more than the seventh breaker travelling a little farther up the beach.

MAN INTO WOLF

Even if Singh and Zingg[3] had not lately collected and published authentic instances of "feral man," no-one could now doubt that human beings have at times abjured, or failed to acquire, human behaviour. Their adoption of many of the habits of beasts has often been the outcome either of mental disease of upbringing by a feral fostermother—especially olf, as in the striking instance related by Gesell,[4] the earlier more famous one mentioned by Livy. Robert Eisler, however, in a lively address to the ion of psychiatry of the Royal Society of Medicine June 8, took a bolder, wider view of the genesis of ine traits in human beings. Ranging freely through hropological and psychopathological data, and with ch evidence of philological virtuosity, he examined sadism and masochism, especially the latter, and w a distinction between algolagnia and algobulia—a n he coined forty years ago to denote an enjoyment pain which could not be regarded as a perversion. his view sadism and the qualities related to it are human; it is scarcely correct to call them atavistic, by atavism one means reversion to the primitive age, since primitive savages are neither the noble iple men of Rousseau's imagining nor the cruel and rlike creatures we know in some peoples. But reversion re certainly is. Originally, long before Neanderthal Piltdown man, we were frugivorous and mild; at some remote time a change occurred, and man became capable of murder and warfare. Many myths and folklore tales refer to this change and to the persistence in women of man's original gentleness. The names of many tribes and groups—e.g., the Lycians—attest the wolf-like qualities they developed as the result of some mutation, so that they came to imitate the behaviour of predatory animals like wolves. Hence the werewolves who have been described in so many countries; hence also the survival of wolf-like religious rituals, as in North Africa today (Dr. Eisler illustrated this with slides of a dilaniating sheep-clad officiant in Morocco). Dr. Eisler's exposition followed a line of thought akin to that of C. G. Jung in his theory of archetypes, and still more reminiscent of the pseudobiological speculations of the late F. G. Crookshank.

THE NEGLECTED CHILD IN HIS OWN HOME

The Curtis report on children deprived of a normal home life called attention to the many other children "who, though suffering neglect, malnutrition, or other evils, are still in their own homes under their parents' care." Such children, who are equally deprived of a "normal" home life, are the subject of a study[1] made last year by a committee of the Women's Group on Public Welfare, in association with the National Council of Social Service—the same group whose book *Our Towns*, published a few years ago, threw into such clear relief the social conditions revealed by evacuation. The children affected in this new inquiry, though only a small proportion of the total child population, are exceedingly numerous. Thus in 1944–45 alone the National Society for the Prevention of Cruelty to Children dealt with 107,312 children coming from 41,050 families—nearly as many as the whoel group of deprived children studied by the Curtis Committee. Wilful physical cruelty is uncommon, and fortunately getting rarer. Thus in Liverpool there have been 7000 recorded cases of neglect in the last ten years, but only one case of cruelty in each of the last two; and similar figures are reported elsewhere. "Neglect" has been interpreted by the Women's Group as "failure to make adequate provision for the physical, emotional, and intellectual needs of a child"; and this includes gross failure to provide affection and security. Yet it is evident that even a neglectful mother can often give her children a sense of security scarcely to be replaced in any other way: "the unhappiness of the victim . . . at being parted from the offender" greatly complicates the management of these cases. And indeed the offender is often herself a victim. She is most commonly, as Mr. J. B. Priestley says in a preface to this report, "an unhappy creature who is by no means a thoroughly bad sort, who is not really mentally warped, but who, because of ill luck, indifferent health, too much child-bearing, a poor fish of a husband, or no husband at all has just let things slide and slide until at last she cannot even pretend to be coping with her job as a parent." Mothers sentenced for child neglect, the Women's Group found, gave as explanations of their offence such things as bad housing, lack of money, and lack of anyone to look after the children while they were away at work or elsewhere. Often a neighbour had accepted responsibility and then let them down. Not one of the mothers gave ill health as a reason for their failure, though 75% of them were below average health standards when sentenced.

The Women's Group think prison an ineffective remedy in such cases; and indeed it is doubtful whether most of the mothers would be sentenced if they had someone to plead their cause. Set before a prosecuting solicitor and a magistrate, the dazed uncomprehending woman hears herself committed to prison, or learns that her children

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State of the Public Health During Six Years of War. Report of the Chief Medical Officer, Ministry of Health, London, 1946.

Singh, J. A. L., Zingg, R. M. Wolf Children and Feral Man. New York, 1941.

esell, A. Wolf Child and Human Child. New York, 1941.

[1] The Neglected Child and his Family. A Study made in 1946–47. London: Oxford University Press, 1948. Pp. 140. 5s.

must be excluded. Other cases may have to be differentiated from poliomyelitis, meningitis of bacterial or virus origin, acute nephritis, or the various forms of hepatitis. The similarity of the symptoms to the meningeal form of Weil's disease or to "swineherd's disease"[15] may suggest leptospirosis, but the diagnosis depends finally on laboratory investigations. If leptospirosis is suspected during the first week, the organism may be isolated by inoculating blood and cerebrospinal fluid into hamsters and into appropriate culture media. The agglutination reaction usually becomes positive about the eighth to tenth day, but the appearance of agglutinins is delayed in some cases. Repeated tests should be done, especially when penicillin treatment has been given, because there is some evidence that this drug curbs the production of antibodies, perhaps by reducing the number of leptospiræ and so lessening the antigenic stimulus. During the third and fourth weeks leptospiræ may be present in the urine, and, provided the specimen has been made slightly alkaline, the organisms can be isolated from this by animal inoculation. Only very rarely can leptospiræ be found in wet blood films, but "blood filaments" derived from the cells are fairly common, and these fine threads often seem motile because of the brownian movement of particles in the fluid; this is a likely source of error. Treatment in most cases has been symptomatic because of the difficulty of early diagnosis. There is as yet no specific antiserum, and *L. icterohæmorrhagiæ* antiserum would be ineffective since there is no cross-protection between the two types of leptospira. The relatively benign character of the human disease makes it difficult to assess the value of drug therapy in man, but penicillin has given strikingly good results in dogs.[16]

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[15] Gsell, O. *Bull. schweiz. Akad. med. Wiss.* 1944, 1, 67.

[16] Joshua, J. O., Freak, M. J. *Vet. Rec.* 1947, 59, 595. Mills, E *Ibid*, 1948, 60, 267.

Annotations

SIR RONALD ROSS

WHEN, in July, 1898, Ronald Ross finally established the mosquito theory of the origin of malaria, he cleared a path along which we have travelled far enough for the control of this disease to be a routine and its extermination a vivid possibility. Ross's early studies, after he joined the Indian Medical Service in 1881, were undertaken in ignorance of Laveran's identification, in 1880, of the malaria parasite. But while in England in 1894 he met Patrick Manson, who showed him the parasites and suggested that they might be transmitted from man to man through the mosquito. Returning to India the next year, he set out to discover what happened when the blood of a malaria patient was swallowed by a mosquito; and after many disappointments he proved, on Aug. 20, 1897, that the mosquito was the intermediary in transmission.

This week the Ross Institute marked the jubilee of the completion of this work, by a reception and an exhibition. Here were to be found Ross's letter to Manson, recording step by step the course of his labours. Here also was depicted the gradual, and still evolving, mastery of the infection from the day that his work in India ended. Even after 1898 all was not easy for him. Part of his life was embittered by rival claims to those laurels that were properly his; and, as often happens with people that have something new to say, he had to overcome what Mr. John Masefield (speaking at the reception) stigmatised as "the vast dark sullen apathy of the multitude of man." The full significance of his discovery came to be recognised through his own application of it in Sierra Leone and elsewhere, through Sir Malcolm Watson's initiative in Malaya, and through successful imitation by others. By the time that he died, in 1932, he knew that his place in history was assured.

Though no dilettante, Ross was a man of many interests, ranging from research on pure mathematics to the devising of a system of phonetics. He chose, too, to express himself in poetry, of which the Poet Laureate said: "If the verse will jar your ear, the intelligence will jar your complacency." The passing of the years has underlined our debt to him. As Ross himself said in his Nobel prize lecture: "The spring had been touched, the door flew open, the path led onward full in the light, and it was obvious that science and humanity had found a new dominion."

CAVALCADE OF PUBLIC HEALTH

A HUNDRED years ago, when the first Public Health Act was passed, the sanitarians were playing for high stakes, since the future of industrial civilisation depended largely on their success. The Industrial Revolution had huddled its rapidly recruited army of wage-slaves into a squalor which inevitably bred pestilence; long years of uncontrolled industrialism had blighted great areas of our towns, and stunted the men and women in them. Much of that blight is still with us as a main obstacle to decent town life; but even by the end of last century, with sanitation under way, attention could be turned to the national physique, whose deterioration was bitterly deplored with each threat of war. How the empire of public medicine gradually widened by stages is shown in the "cavalcade of public health" so cleverly presented in the latest annual report from the London School of Hygiene and Tropical Medicine.[1] First there was the pioneering of the personal health services, the school medical service, maternity and child welfare, and the tuberculosis services. And then came modern State provision for the sick, with home doctoring under National Health Insurance, and the provision of public general hospitals after 1929. Each service was good of its kind but developed in isolation from the others.

In 1854, when the General Board of Health, of which Chadwick was chairman, was undermined by opposing public opinion and lost most of its powers, it was felt that the Public Health Act of 1848 had miscarried. Yet, as Disraeli was to say twenty years later, "In legislation it is not merely reason and propriety which are to be considered, but the temper of the times." The "cavalcade" shows that the subtle change in the temper of the times between 1854 and the passing of the next Public Health Act in 1875 was brought about less by reforming zeal than by hard work and [illegible] accidents. Much of the hard work was done by F[illegible] and Simon. Dr. William Farr, of the Registrar-General's office, was a statistician with a vivid pen who brought the confused facts of sanitary science "into light, harmony, and order." He had a skilful disseminator of his vital statistics in Sir John Simon, M.O.H. for the City of London. Simon piled up news of yellow fever brought by barques from Cuba, distress in Lancashire from the cotton famine, cholera brought by Ba[illegible] emigrants, malaria in the Isle of Sheppey, epidemics [illegible] smallpox, typhus, typhoid, and scarlet fever. Fr[illegible] such facts he built his famous reports—a mass of ha[illegible]

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[1] Report of the work of the school for the year 1946–47.

BRITISH MEDICAL ASSOCIATION

IN dull weather with bright intervals the association last week concluded the first annual meeting it has held for nine years. The attendance was larger than might have been expected in the difficult circumstances, and Cambridge left nothing undone to give its visitors a stimulating and refreshing few days. For the two great receptions, presidential and civic, the Old Schools provided a noble setting; and a most friendly welcome as given in the colleges.

At the annual dinner the VICE-CHANCELLOR (Canon aven) and the MAYOR (Mr. G. F. Hickson) replied to e toast of the University and Town of Cambridge, oposed by Sir HUGH LETT. Prof. G. M. TREVELYAN, M., spoke of the zealous care given to the people of his n countryside by their doctors, "a willing service that o private fees nor State salary can buy." That 50 illion people could live in so small an island as ours as due, he thought, as much to the work of doctors as f captains of industry, and their part was more innocent. r. GUY DAIN described the B.M.A. as a voluntary ssociation of doctors to preserve their honour and nterest: who else was in a position to hold together the arious sections of the profession? This year it had chieved what had never been done before: it had organised, or modified the organisation of, a service in which the freedom of the profession and the public were preserved. "We are on the point of starting a service such as has never before existed." Now that the struggle was over and freedom had been attained, doctors would put their best efforts into making it a really fit and proper and good service. But the price of freedom was still eternal vigilance, and that would be the B.M.A.'s work. Dr. V. H. L. ANTHONISZ (Ceylon) was also hopeful, though the National Health Service would no doubt suffer from infantile troubles such as convulsions and growing pains, as well as "the difficulties attending the arrival of an unwanted child." Responding for The Guests, proposed by Dr. ROBERT ELLIS, the LORD LIEUTENANT (Capt. R. G. Briscoe) said he had known for some time that something awful was going to happen in 1948, "because here in Cambridgeshire we've had the worst apple crop for many years." And finally Sir LIONEL WHITBY replied to the toast of The President, proposed by his professorial colleague, Dr. E. D. Adrian, O.M.

On Friday evening Sir HENRY DALE, O.M., delivered the popular lecture on Accidents and Opportunism in Medical Research.

Scientific Sections

MEDICINE

President: Dr. LESLIE COLE

Thiouracil in Thyrotoxicosis

Wednesday, June 30, was cold and wet; but neither cold, rain, nor poster maps prevented the assembly of a fair crowd to hear Prof. H. P. HIMSWORTH's vigorous defence of thiouracil. This drug, he said, can certainly bring the symptoms of thyrotoxicosis rapidly under control, and it is now known that an initial dose of 200 mg. a day of methyl thiouracil, followed by a maintenance one of 25–50 mg. a day, is usually just as effective as the much larger doses formerly used. Of his cases treated for between nine and twenty-one months two-thirds have secured a long remission. Judged by symptoms, gain in weight, pulse-rate, effects on lid-retraction, and so on, thiouracil is as effective as surgery, except that it only rarely gets rid of the goitre. Harmless toxic reactions occur in 10% of cases, but granulocytopenia in only 2%; and with early diagnosis, and penicillin treatment, only 25% of the latter, or 0·4% of all cases treated, die of this complication. Regular white-cell counts are worse than useless in guarding against agranulocytosis, because they give a false sense of confidence. Patients should be told to consult their doctor immediately if they have fever, sore throat, or any illness, and the doctor should simply examine a stained blood-film to see whether polymorphs are deficient or not. There is no danger of producing carcinoma with therapeutic doses. Pressure symptoms, a suspicion of malignancy, and the occurrence of agranulocytosis during thiouracil treatment are absolute indications for surgery. For the rest, the mortality from surgery is 2% in the best hospitals, and considerably higher elsewhere. Thiouracil can do all that surgery can, with a mortality of 0·4% and at a cost simply of swallowing one small tablet each evening.

Mr. CHARLES DONALD, dismissing the Gospel according to Gower Street in favour of the Book of the Word from Whitechapel, had little use for figures. Control with thiouracil, he said, is no more than a damping-down of symptoms which makes life more or less tolerable. Some patients who had been treated with apparent success with thiouracil, and had afterwards come to thyroidectomy, said they had thought they felt well while on the drug, but after operation they knew what it was to feel really well. Thiouracil means a long period of therapy under constant supervision, during which the patient is often made into an invalid. The mortality from surgery should not be greater than 1%. It offers dramatic and immediate amelioration of symptoms, a rapid return to normality, a surer return to health, and a relapse-rate of less than 5%.

Subsequent speakers made useful contributions in an attempt to resolve this conflict of opinions. Thiouracil, it seems, is admittedly better than a bad surgeon. There is still much to be learnt about its use, and better thiouracil may some day be better than any surgeon, in properly selected cases. Meanwhile, thiouracil has made surgery much safer, and thiouracil followed by operation is possibly, for the moment, the treatment of choice in the majority of cases. Dr. COLE has found thiouracil of particular use in the treatment of exophthalmic ophthalmoplegia, and for therapeutic test in the diagnosis of doubtful cases of toxic goitre.

Phonocardiography

Dr. E. D. H. COWEN gave a lucid explanation of phonocardiography and showed two patients to illustrate the kind of problems it may help to solve.

Surgery in Hypertension

Thursday morning was merely bitterly cold, but a combined meeting of the sections of medicine and surgery crowded the zoology theatre to hear Dr. R. H. SMITHWICK (Boston, U.S.A.). He confined his remarks to 256 cases he has been able to follow for from five to nine years. Distinguished pioneer of the subject that he is, his contribution dwarfed that of anyone else; but his work must be read in detail. Hypertension, he said, kills more people than cancer: has surgery anything to offer? Of five different techniques for sympathectomy, he favours for most purposes that which removes in two stages the sympathetic chain from the 8th thoracic to the 1st lumbar ganglia, together with both splanchnic nerves. His operative mortality has been 2%. Mortality in the months after operation is highest below the age of twenty and over the age of fifty, but depends on the state of the patients before are to be committed to others until they are 18 or for a period to which no term may be set. The Women's Group recommend that parents should be legally represented when charged with cruelty or neglect, and that the power of placing parents on probation should be more freely and fully used. A child, they consider, should not be removed from his parents until the question of keeping the family together has been fully examined. They describe various schemes for training the mother in her craft, including the residential recuperation home for mothers with their children set up by the Community Council for Lancashire at Brentwood, near Manchester. They also advocate more "rest break" and holiday homes for mothers, development of home-help schemes, and an extension of family case work by local authorities, either directly or through voluntary bodies.

RESEARCH ON PHYSICAL FITNESS

THERE are good reasons why the interest in physical fitness, renewed by the war, should be sustained. The term has a wide usage, both lay and medical: the doctor is interested in the fitness of his patients for various types of work, the physical educator in the athletic skill and precision of his pupils, the manufacturer and the State servant (civil or military) in the efficiency with which a job of work is done. Yet the physiologist and the psychologist, on whom we must depend for clarification and systematisation in this field, have as yet only stalked warily round the hedges. The wariness extends beyond the laboratory, too, and is the chief characteristic of a recent American report by a subcommittee of the Baruch Committee on Physical Medicine.[1] The authors of this report point out that at least four aspects should be included in any tests or survey—(1) general cardiovascular, respiratory, and neuromuscular fitness and efficiency for moderate prolonged or rapid exhausting work; (2) skill and agility of the neuromuscular system, partly inborn and partly acquired; (3) special physical strength for specific heavy or exacting tasks; and (4) motivation, the will to carry out the task to the very best of one's ability.

The various physiological tests of the first three aspects have lately been summarised and discussed in Cureton's book,[2] half monograph, half textbook. Both constitutional factors (notably physique and sex) and more transitory disturbances (such as "a night out") affect the various test scores. It has been shown, for instance, that women, on the average, have a higher blood lactic acid after moderate exercise of a few minutes' duration than do men.[3] Trained men produce less lactic acid than untrained,[4] and men suffering from a neurosis produce the highest lactic-acid levels of all, as has been shown by Maxwell Jones and his associates.[5] [6] Thus the lactate levels parallel the degree of fatigue complained of by each group.

Two recommendations of the subcommittee will, we believe, be enthusiastically received. First, "the routine medical history and physical examination can and should do more than assess physical defects": it should include tests designed to measure aspects of fitness. Secondly, the medical schools, and especially the departments of physiology, should spend more time teaching the student the reactions of the intact healthy human organism to various stress conditions, as is now done by Professor Landis at Harvard.[7] In such an endeavour psychologists should also have their say. We may hope that in this way both fundamental research and its intelligent application would be fostered.

PAIN IN ANIMALS

THE humane will welcome guidance about the capacity of animals to feel pain. In a pamphlet,[1] published by the Universities Federation for Animal Welfare, Mr. John R. Baker, D.SC., reviews the evidence.

Human reactions to pain and fear are a struggle to escape, contortions of the body and particularly the face, and production of mournful sounds; and we are likely to attribute sensations of pain to an animal which shows any of these manifestations. But we cannot always be certain that their presence indicates pain or their absence the lack of it. Thus a frog whose brain has been destroyed will still draw its foot away from the touch of acid, and a mollusc, which has no gift for flight, cannot betray pain by an effort to escape. Animals that live in groups, especially when the young are tended by parents, are apt to call attention to pain in ways that resemble our own. A non-social animal, on the other hand, gains no help or consolation by calling attention to pain or fear; and may mislead us by its silence and stillness. Psychological fear, from memory and apprehension, is probably confined to the higher animals: those in which the cerebral hemispheres are poorly developed may experience immediate pain through the thalamus, but are likely to suffer less than man from memory of past pain or fear of pain to come. The vertebrates, with a nervous system akin to our own, are presumably able to feel pain in the same sorts of way as we are, but the primitive invertebrates, with a diffuse nerve-net and no cerebral ganglia, cannot be supposed to be any more "conscious" than our own bowels, which can be cut and handled painlessly. "We can only base our opinions as to whether invertebrate animals are conscious of pain," Dr. Baker says, "on considerations of the size, complexity, and degree of integration of the nervous and sensory systems, and on the intelligence of the animals as shown by their capacity to learn and adapt their behaviour to unusual circumstances." He credits the higher arthropods and molluscs with consciousness; which suggests that those who feel uncomfortable about the boiling of lobsters are only too right

WORLD HEALTH ORGANISATION

THE World Health Assembly last week unanimously decided that the headquarters of W.H.O. shall be in Geneva. This decision is subject to final confirmation by the General Assembly of the United Nations, but no opposition is likely. The British Government's tentative invitation to the organisation to bring its headquarters to England[2] was withdrawn some weeks ago.

ROYAL SOCIETY OF MEDICINE

LAST Tuesday, at the annual meeting of fellows, Sir Maurice Cassidy, the president, presented the diploma of honorary fellowship to Sir Archibald Gray, Prof. Charles Singer, and Sir Henry Tidy. The other three recipients are Prof. Georges Debaisieux (Louvain Dr. Mathew Makkas (Athens), and Field Marshal Smu Sir Henry Dale, O.M., G.B.E., F.R.S., was elected president for 1948–49. The society now has 9028 fellows, member and associates, of whom 1290 live abroad.

Dr. J. W. S. BLACKLOCK, professor of pathology at Glasgow since 1937, has been appointed to the university chair of pathology tenable at St. Bartholomew's Hospital. Dr. James Whillis has succeeded to the chair of anatomy at Guy's Hospital.

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1. Darling, R. C., Eichna, L. W., Heath, C. W., Wolff, H. G. *J. Amer. med. Ass.* 1948, 136, 764.
2. Cureton, T. K. Physical Fitness Appraisal and Guidance. London, 1947.
3. Metheny, E., Brouha, L., Johnson, R. E., Forbes, W. H. *Amer. J. Physiol.* 1942, 137, 318.
4. Taylor, C. *Ibid*, 1944, **142**, 200.
5. Jones, M., Scarisbrick, R. *Psychosom. Med.* 1946, 8, 188.
6. Tanner, J. M., Jones, M. *J. Neurol., Neurosurg., Psychiat.* 1948, 11, 61.
7. Landis, E. M. *Harv. med. Alumni Bull.* 1944, 19, 9.

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1. The Scientific Basis of Kindness to Animals. Obtainable from UFAW, 284, Regent's Park Road, Finchley, London, N.3.
2. *Lancet*, 1948, i, 758.

and the results, though not perfect, were better than with any other. In the light of over 300 cases, most of which had been followed up, Mr. Ronald Reid thought that constitutional treatment in an institution, assisted sometimes by splinting of the neck, and sometimes by tonsillectomy, should be continued until the glands became quiescent. Only then should diseased glands be removed, through a transverse incision. Block dissections and chasing of gelatinous glands up and down the neck were condemned. In 291 of the 302 cases followed up there had been no recurrence of the glands. One case had subsequently developed tuberculous meningitis and two pulmonary tuberculosis.

Tuberculous mediastinal glands are very difficult to diagnose, in Mr. Hugh Reid's experience, and these cases may present as bronchitis, bronchopneumonia, or collapse, or as general malaise and listlessness. He thought that tuberculous mesenteric adenitis might be treated either conservatively or by appendicectomy. He regarded the appendix as a sort of abdominal tonsil.

Other speakers deplored the almost insuperable difficulty of getting patients with tuberculous adenitis into sanatoria. Many of the physical methods used were condemned as attempts to do something, faute de mieux. The real treatment of tuberculous glands was to prevent the sale of tuberculous milk. Only Mr. F. Stock advocated radical excision of abscess cavities and outlying glands; most speakers favoured small incisions, some with judicious use of the sharp spoon: bipp was not considered of much use. Hamilton Bailey's method of excising skin and leaving the wound to granulate found some support in cases with sinuses. Mr. R. D. Porter mentioned that he had sectioned 200 " cold " appendices and found evidence of tuberculosis in 20%.

Treatment of Carcinoma of the Breast

In discussing the lymphatics of the breast, Sir Cecil Wakeley pointed out that there were no direct connexions between the breast and the supraclavicular glands; so if these were involved they were invaded via the internal mammary chain. Nor did the apical axillary glands drain into the supraclavicular glands. The symptoms which brought the patient to the doctor were a lump in the breast and pain, and pain was a late symptom. Any doubtful lump in the breast should be excised and examined histologically. The laity should be convinced that early cancer of the breast was curable. In stage-I cases—i.e., those with no enlargement of axillary glands—radical mastectomy was the treatment of choice. If the growth was in the inner part of the breast the internal mammary glands might be invaded, though there was no clinical indication to show that the growth had in fact become a stage-II growth. In stage-II cases preoperative irradiation should be followed by radical mastectomy. For stage-III and stage-IV cases, irradiation was the treatment of choice. Testosterone should be given an extended trial in stage IV. A common error of treatment was to underestimate the extent of the disease and under-operate or under-irradiate. Deep X-ray therapy should be standardised. Lack of facilities for X-ray treatment throughout the country was largely responsible for the poor results. Dr. Frank Ellis preferred deep X-ray treatment to radium as a means of irradiating breast cancers, because it was more uniform in application. Radium gave a localised effect, too much so for treating the internal mammary lymphatic chain (which could well be irradiated with deep X rays), and in the axilla it tended to cause brachial neuritis. Dr. Ellis did not fully agree with Professor McWhirter on the desirability of irradiation and simple mastectomy. Many fallacies crept in when comparing different series of cases. Mr. J. B. Oldham contended that the chief factor in getting cases too late was economic. The busy mother or the self-supporting spinster felt she could not afford the time off work. The public still often believed that cancer was painful in its early stages. All stage-II cases should have preoperative irradiation. In operable cases, a radical mastectomy was more important than radiotherapy. Like Sir Cecil Wakeley, he thought that radical mastectomy should start with the dissection of the axilla, and the brachial artery and nerves should not be stripped bare.

In Mr. R. L. Holt's view we had not advanced far from Halsted's results. Halsted had found that 2 early cases out of 3 could be cured, but when the axilla was involved 3 out of 4 succumbed. There was still great divergence of opinion among leading authorities on the best form of treatment. Radical mastectomy gave much better results in stage I and II than some enthusiastic radiotherapists would lead one to believe, but it must be done well. Radiotherapy was a " holding " treatment, and a series of over 100 cases treated at the Christie Hospital initially with X rays and subsequently operated on showed that there were viable cancer cells in the treated areas in 80% of cases. In another series treated by X rays it was found that the longer the patient survived the more certain was it that the primary tumour would show signs of reactivity. Radium was on the whole more effective than X-ray treatment, but it was more difficult to get even dosage. Radiotherapy had not greatly improved the results of surgery. The real answer to the problem was to get the cures earlier and to teach students that the so-called signs of malignancy in the breast were signs of late malignancy. Mr. R. S. Handley thought that the reason why 25% of stage-I cases subjected to radical mastectomy died within five years of operation lay in invasion of the internal mammary glands. He had explored the 2nd or 3rd intercostal space in 31 cases of carcinoma of the breast and Dr. A. C. Thackray had found invasion of the internal mammary chain in 15 cases. Three of these 15 cases had had no deposits in the axilla and would have been looked on as stage-I cases if the intercostal space had not been explored. Mr. James White pleaded for hormone treatment in late cases and showed X-ray films of pelvic deposits which had almost disappeared under androgen therapy. Prof. E. F. Finch mentioned leucotomy in cases of intolerable pain with untreatable secondary deposits. He urged that the treatment of cancer cases did not finish when the growth had been operated on.

The *Surgery of Hypertension* was discussed jointly with the section of medicine (see above).

ORTHOPÆDICS

President: Prof. T. P. McMurray

Lesions of the Intervertebral Discs

The differences of opinion on this subject are still capable of introducing a certain amount of passion into debate.

Prof. Norman Dott (whose paper was read, in his absence, by Mr. G. L. Alexander) indicated the size of the problem by estimating the incidence of new cases of lumbago-sciatica due to disc prolapse at something like 300 per million of the population per annum. From the standing position, with its evolutionary weakness, the lesion throws the sufferer back to an older and more crouching attitude. Though the hazards of the upright posture are unavoidable, physical unfitness should be prevented, for it predisposes to the common causative " trauma in suprise," when weak postural muscles are caught off their guard; a significant local trauma of this kind occurs in half the cases, while the strain of pregnancy is also a common factor. There are several types of prolapse, and it is easy to miss a small lateral protrusion at the intervertebral foramen or the diffuse bulge caused by nuclear rupture into the annulus. The escape of free nuclear material into the epidural fat sometimes provokes a chronic granulomatous reaction, with severe symptoms and a greatly raised protein level in the cerebrospinal fluid, which may be mistaken at operation. The outlook is bad for patients with congestive failure or poor renal function, and very bad for those with both. In the majority, five to nine years later there has been improvement or no change in the state of the fundi, of the electrocardiogram, and of the renal function. The diastolic pressure is reduced in a good proportion, but this proportion grows less as the follow-up exceeds five years. Symptomatic relief is often striking and very satisfactory. A control series treated medically is hard to find, and has to be broken down into groups before any real comparison is possible. So far as comparison can be made at present, the mortality in Smithwick's series is noticeably lower than in those treated medically.

Dr. Horace Evans briefly reviewed hypertension from the days of Bright to the recent work of Trueta and his colleagues, and pleaded for more careful study of the types of hypertension. In selecting cases for sympathectomy, cardiac asthma is always a contraindication. A blood-urea above 100 mg. per 100 ml. is a contraindication in malignant hypertension but not in nephritis. The family history should not be neglected. Benign hypertension presents the greatest problem in selection, since patients with this condition often live happily for many years without operation. The majority of cases operated on show symptomatic improvement, especially relief of headache; and often great improvement in the condition of the fundi. We need more careful assessment and selection of cases, control series treated medically, biopsies of the kidney at operation, and a study of invalidism before and after operation; but sympathectomy, though only a palliative, certainly has a place in the treatment of hypertension.

Mr. D. W. C. Northfield gave his results in 46 cases operated on up to the end of 1947, and pleaded for discrimination in the use of sympathectomy. Dr. A. Rae Gilchrist reported fairly comparable series of cases treated medically and surgically in Edinburgh, which confirmed that surgery has its place, especially in malignant hypertension. Mr. F. E. Stock discussed sympathectomy in hypertension following toxæmia of pregnancy in young women, in which the operation has produced some of its best results. Dr. William Evans proposed a novel definition of hypertension which was designed to prevent unwarranted invalidism, but would certainly be a shock to doctors in insurance practice. His criteria for the selection of patients for operation included changes in the T wave in certain leads. Mr. A. Dickson Wright didn't care if the T wave was upside down or not, provided he could relieve a patient of a shocking headache and enable him to work and support his family. He favoured a transthoracic approach, which, he said, gives the surgeon a beautiful view, leaves the patient with nothing worse than a Horner's syndrome and a nice warm foot, and is apparently particularly acceptable to hypertensive high-pressure business men.

Modern Management of Megalocytic Anæmias

At the final meeting Sir Lionel Whitby began by reading a communication from Dr. George Minot, who was unhappily prevented by illness from being present. This told the story of pernicious anæmia down to the isolation by Rickes and his associates in America of a crystalline material in small red needles. This substance is said to be potent in pernicious anæmia in a single intramuscular dose of 3 microgrammes, and must surely be the active principle of liver extract at last. Omitting with characteristic modesty any mention of his own name, Minot concluded: "Despite the great advances in knowledge of pernicious anæmia that have occurred during my thirty-six years in medicine, there are puzzles enough to attract the curious for a long time to come."

Sir Lionel Whitby dealt ably with the principles of diagnosis and treatment. Macrocytosis, he said, is a symptom, just as anæmia is. It can be measured in various ways, but most satisfactorily by cell-volume determination, supplemented by the examination of a stained film. Sternal puncture is essential for distinguishing between the megaloblastic marrow of pernicious anæmia and the macronormoblastic marrow of the other macrocytic anæmias. Liver extract and folic acid are active when the marrow is megaloblastic, but folic acid has the disadvantage that it fails to prevent, and sometimes precipitates, neurological complications. Probably a complicated enzyme system is involved and its coördination is upset by too massive a dose of one constituent.

Dr. J. F. Wilkinson, having treated 1600 cases of pernicious anæmia in nineteen years, is frankly optimistic about the results, provided treatment is properly carried out. But liver extracts, like many other things, are not what they were before the war; and this is not surprising, since only liver rejected as unfit for ordinary human consumption goes to the pharmaceutists for the manufacture of a drug needed to cure a fatal disease. None of his patients treated with liver extract and hog-stomach preparations have developed neurological complications, but 15 of 20 patients treated with folic acid have done so.

Dr. C. C. Ungley described his experiences with the red crystalline substance isolated from liver in England by Lester Smith. This is probably, he said, the same substance as that found by Rickes in America Good hæmatological responses were produced by as little as 8 to 10 microgrammes, and the substance was as effective in subacute combined degeneration as liver extract is.

Dr. R. R. Bomford discussed errors in diagnosis and management which may result from confusion between pernicious anæmia and anæmia in hypothyroidism. These, he said, still occur, not perhaps in the great temples of hæmatology, where some of his audience had their dwelling, but in the outer courts and out-patient departments, where general medicine is still practised.

SURGERY

President: Mr. Vernon Pennell

Treatment of Tuberculous Lymphadenitis

Speaking on tuberculous cervical glands in children, Mr. Denis Browne stressed the importance of the tonsils and adenoids as a portal of infection, and called for further work on tuberculous infection of the adenoids, which he had found 3 times in a series of 15 adenoids sectioned. One of the difficulties in diagnosis was to detect mixed infection of cervical glands with tuberculosis and streptococci—grave infection by either organism was easily recognised. In treating tuberculous cervical glands he waited till the skin was becoming adherent, then made a $^1/_4$ inch incision, and, using the full strength of his fingers, expressed the swelling. He squeezed perhaps a dozen times until the squeezing yielded pure blood. Packing and drains were contra-indicated. The tonsils and adenoids must also be considered. Sea air and ultraviolet light were useful in misdiagnosed streptococcal infections. In his view splinting was ineffective and aspiration incapable of removing necrotic debris. Incision and curettage might fail to remove a necrosing gland and might open the jugular vein. Wide incision and wide excision of skin, leaving the wound to heal by granulation, left scars, which were only invisible a long way off. Block dissection though an excellent surgical exercise, would not eradicate the entire lymphatic system of that side of the neck and it carried a definite mortality, a big disadvantage where one was dealing with a disease which did not kill. The method Mr. Browne used did not spread infection.

Chronic Arthritis

Mr. W. GRANT WAUGH showed a short film on injection treatment with lactic acid, and the technique and results were discussed. It was agreed that the method has shown itself of use as an additional weapon in the attack on chronic arthritis, even though it is hard to separate the benefits of the treatment as such from those of the energetic physiotherapy which accompanies it.

DERMATOLOGY

President : Dr. C. H. WHITTLE

Occupational Dermatoses

Dr. J. T. INGRAM emphasised that investigation of the occupational dermatoses requires not merely study of a group of eruptions but comprehensive inquiry concerning the patient, his activities, and his environment. Occupational factors included not only the physical and chemical nature of the materials with which the patient came into contact, but also prophylactic and cleansing procedures, and atmospheric and other physical characters of the environment in which he worked, and the social, psychological, and economic aspects of his position. Dr. Ingram classified occupational dermatoses into three groups :

1. Those peculiar to particular trades or processes, and ranging from oil acne to anthrax, and from pitch warts to erysipeloid.
2. Traumatic dermatoses, caused by irritants which would damage the skin of any normal subject.
3. Those essentially constitutional, precipitated by wear and tear of the skin or by the development of personal sensitiveness.

Dr. Ingram stressed the importance, in diagnosis, of the patch-test, and, in treatment, of obtaining the patient's collaboration by explaining to him the nature of his disease.

Dr. SIBYL HORNER said that for prevention it was important to attend to inspection, selection, and cleanliness, and also the enforcement of minimal contact with irritants. She suggested that those who were to work with serious hazards should be introduced to them gradually by slowly increasing exposure to the irritant ; in this way susceptible persons could be weeded out before serious skin reactions appeared.

Dr. J. C. BELISARIO (Sydney) referred to dermatoses caused by mites, to slag-wool dermatitis, and to lesions associated with solar irritation. Dibutyl phthalate applied to the clothes had proved one of the best prophylactics against mites.

Dr. JAMES WARNOCK mentioned friction as a factor contributing to the development of dermatitis. In his opinion the increased incidence of occupational dermatoses in textile workers was due to inexperience among the personnel, longer hours of work, and changes of technique whereby more hazardous oils were used. In engineering much of the increased morbidity was due to the increase in high-speed work which necessitated the use of cutting oils. Examination had shown that of french-polishers 1 in 8, and of cloth scourers 1 in 3, had dermatitis but continued at work.

Dr. G. A. HODGSON said that of patients with dermatitis due to oil, 48% developed the eruption within two years of commencing the work. Dermatitis due to abrasives, as seen in coalminers, developed, in 82% of cases, after as much as 20 years at the work ; while dermatitis due to soap and cleansing agents also appeared after some 20 years.

Dr. W. J. O'DONOVAN recalled that work was the curse of Adam ; therefore anything unfortunate which occurs during working life must be due to this curse. Moreover, if work was a curse, leisure must be the right pursuit for man. Eruptions arising from psychological causes were thus often attributed by the worker to his occupation ; but the physician had to keep an open mind. Men, he observed, suffered from dermatitis; women with the same eruptions had eczema. Mother-fixation was often the cause of eruptions on the hands of young women, affording an excuse to return to the shelter of the maternal home.

Dr. A. THELWALL JONES discussing prevention, said that correct design of plant, education of the worker, avoidance of overcrowding, and proper facilities for personal hygiene were all important. Though not a dermatologist, he warmly advocated the provision of many more beds for dermatological departments.

Dr. R. M. B. MACKENNA said that in reablement there were two sets of problems, depending on whether one was dealing with early or long-standing cases. He discussed briefly "hardening" and the problems presented by "green labour," the necessity for rapid assessment and diagnosis, change of occupation, and the importance of keeping early cases at suitable work under supervision. Finally he described the problems of a rehabilitation centre for chronic cases.

Dr. ROBERT FORBES said that in arbitration or other court proceedings the doctor had to preserve an unbiased outlook. His attitude and conclusions in the early stages of discussion and report were of great importance ; and no statement should be made which might have to be retracted later.

NUTRITION

President : Prof. R. A. MCCANCE, F.R.S.

Importance of Proteins

Dr. D. P. CUTHBERTSON began by demonstrating that although protein consumption varies widely among different races and even among individuals in the same race, the proportion of calories derived from the protein of the diet is remarkably constant. In infancy, with its rapid growth, the figure averages 13·5% ; in adolescence it is still of the same order—11·9%. It seems to be largely independent of protein intake, for it is fairly constant among all social classes, and even under famine conditions it does not drop much below 11%. Before the days of rationing, the social class of an individual provided a good index of protein consumption. Today protein tends to form some 11–12% of the diet of all adults and from 13–14% of that of children. Requirements are increased during the latter half of pregnancy and during lactation. Protein loss after trauma and operations can be remedied by giving the patient as early as possible a diet rich in protein, to restore the negative nitrogen balance ; and if operations must be done on debilitated patients they should receive a preoperative diet rich in protein. One of the richest protein foods for this purpose is milk in which skim-milk powder is dissolved. Dr. Cuthbertson made the interesting observation that the protein-sparing action of carbohydrate is greater if the carbohydrate is consumed at the same time as the protein and not as a separate meal. Civilised man unconsciously recognises this by eating a carbohydrate dessert after a meat course.

Miss HARRIETTE CHICK, D.SC., explained that whereas some protein foods eaten alone will not produce optimum growth they will do so in combination. Thus beef-tea, which is now considered to have very little nutritive value, will not support the growth of young rats, but it will do so if supplemented with white flour. The combined effect of beef-tea and flour is greater than that of either alone. These observations suggest that beef-tea might be of some value to invalids if given with other foodstuffs, even white bread. Similarly potato protein will not support optimum growth, but whole potato fed to rats produces a rapid increase in growth. Dr. Chick suggested that since a mixture of proteins from barley, wheat, and soya-bean produces almost as good growth in rats as milk proteins, such mixtures might be used for feeding the undernourished infants operation for a purely inflammatory process. A transverse ridge, the intermittent protrusion of Falconer or concealed disc of Dandy, may not be shown to be pathogenic until the spine is hyperextended on the table. In spondylolisthesis root symptoms are often due to prolapse of the disc *above* the level of vertebral displacement, occasionally to prolapse below, but never (in Professor Dott's experience) to prolapse at the same space.

Just because the prolapsed disc is the cause of at least 90% of sciatica and lumbago-sciatica, it is particularly necessary to search for the oddities in the clinical picture, such as a suspicious umbilical nodule or an abnormally high C.S.F. protein, which may point to the radiculitis, extradural granuloma, tuberculosis of disc, or tumour, which may actually be present. The level of prolapse is usually clear from the root picture alone, but, since an obvious lesion at the expected site at operation may overshadow a second protrusion at another space, there may be a case for routine myelography.

In treatment, because manipulation is potentially dangerous and because of the inconstancy of any relief from manipulation or epidural injection, the issue lies between rest and operation; but the rest must be real rest and not just pottering about. On the whole, Professor Dott's bias lies towards operation, for since there is no evidence that rest, even in plaster, is really effective it is so much time deducted from the patient's life. If a month's rest gives no real relief, there is no point in delaying operation further, and the waiting period should be even less for those of neurotic temperament; in severe cases immediate operation can be guaranteed to relieve the pain. After operation, patients do early exercises, are up at the tenth day, and are back to sedentary work at six weeks and to strenuous occupations by six months. In 900 operations there have only been 3 deaths, and 1 of these was due to heart-failure.

Mr. NORMAN CAPENER vigorously defended the conservative position in treatment. "Disc lesion," he said, is a loosely used phrase. The actual prolapse is a mere incident in a long degenerative process in only one part of the complex intervertebral articular system, and the explosive clinical onset upsets the physiological control of the whole spine. Immobilisation in a plaster jacket, with the re-establishment of this control by active exercises, gives very good long-term results, and also separates out those cases which, by their failure to improve, will clearly need eventual operation. The results of poorly judged operations are often appalling, and without careful serial radiography it is only too easy to misdiagnose a tuberculous spine.

With equal emphasis, Mr. R. H. YOUNG maintained the value of operative treatment, on the basis of experience with 791 laminectomies performed in association with Mr. B. H. Burns. He was prepared to be quite dogmatic in asserting that the ordinary patient with sciatica or recurrent low back pain can be taken to have a prolapsed disc unless radiography shows some other disorder. Clinical examination is of the simplest, and the picture is characterised by rigidity of the lumbar spine in attempted flexion, with freedom of side bending. The neurological features are quite useless in localisation, and indeed no localisation is possible before operation, when both the 4th and 5th discs must be inspected; double lesions are found in 12–20% of cases. It should not be thought, however, that Mr. Young advocated operation for all, or even for most, cases. The mild ones get better if left to potter about without any interference from the physiotherapist. Severe cases should be rested in bed for two or three weeks in the most comfortable position they can find, and operation should not be deferred too long if pain persists, since this makes for neurotic complications. A five-year follow-up showed that 83% of patients with lumbosacral lesions were symptom-free and back at their old job, compared with 73% of the patients with a prolapse of the 4th disc. But the cure-rate fell steeply for re-explorations, which was why all lesions must be found at the first intervention.

The general discussion which followed showed that operation versus conservatism remains a vexed question and one which may be decided for the individual by such a personal experience as that of Prof. T. P. MCMURRAY—a single attack of sciatica recovering spontaneously without recurrence.

Operative Treatment of Recent Fractures

Proceedings on the second day were on a less controversial level. Everyone agreed with Mr. BRYAN MCFARLAND's theses: that the fracture patient should be at least no worse off after treatment than if left alone; that he should be positively better treated than untreated; that operation should leave him in a better state than non-operative treatment; and that the added risk of operation—a real one—should be commensurate with the expected benefit. The terrible result of one badly performed or infected plating of a fractured femur far outweighs any number of good results. He divided fractures into those in which operation is essential, as for the olecranon with retraction; where it is permissible, as for a difficult fracture of the forearm bones; and where it is inadvisable, as for the scaphoid at the wrist. Mr. JAMES PATRICK, agreeing with these sentiments, pointed out that an obsession with X-ray appearances results in far too many operations. The most perfect X-ray reduction is no index whatever to the function of the part. Surgeons too often still use dissimilar metals for their plates and screws, with inevitable electrolysis and the risk of spontaneous fracture after many years.

Mr. CAPENER mentioned the relative but valuable indication for operation in the mobilisation of elderly patients with intertrochanteric fractures of the femur. Here the early insertion of a combined pin-plate makes all the difference to reablement.

Treatment of Acute Osteomyelitis

Dr. J. TRUETA said that even the experience of four years with adequate supplies of penicillin has not led to agreement on methods of treatment and on results in osteomyelitis, so that some authorities like Leveuf could even declare that there have been no changes of importance. Leaving aside the relatively benign condition in infants, the clinical picture in young children should have been completely changed by chemotherapy; but in fact, though the initial septicæmic phase can now be controlled, the effect on the bony focus is not always so satisfactory. Here there is a septic thrombosis of the nutrient artery, with pus elevating the periosteum, and massive death of bone can be prevented only by a rapid restoration of collateral circulation through the periosteal vessels. This requires that the periosteum be kept applied to the shaft, and that intraosseous tension and œdema be reduced so as to leave the vessels patent. To secure this, operation is essential, except in the earliest cases with complete dramatic response to penicillin and disappearance of local pain and tenderness. Delay of even 48 hours allows irreversible damage to take place; hence the importance of the general practitioner in referring to hospital at once any possible case of osteomyelitis. Operation means simple incision (not reflection) of periosteum where ballooned by pus, drilling of the bone to either limit of the diseased segment, and primary suture, followed by immobilisation. Penicillin should be continued for up to three weeks, and in large doses; for the concentration of the drug within the bone is often much lower than in the blood-stream. Only in this way will a radiographic return to normal accompany clinical subsidence and only thus can recurrent flares of infection be abolished.

Surgery of Congenital Heart Disease

Dr. **Maurice Campbell** analysed the possibilities and place of active therapy in three conditions—patent ductus arteriosus, coarctation of the aorta, and cyanotic heart disease. In the presence of the classical murmur and enlarged pulmonary trunk the diagnosis of patent ductus is not difficult, but the existence of cyanosis would contraindicate operation, for in such a case the ductus might be a valuable compensatory channel. Where there is an uncomplicated patent ductus surgical occlusion is a complete answer and should be considered wherever there are significant symptoms. The mortality is small, but with a symptomless patient it cannot be ignored. The results, however, are excellent and operation is best undertaken between the ages of 7 and 20.

Coarctation is more difficult to evaluate from the surgical standpoint. The operation is undoubtedly difficult and carries a definite risk, but it should be considered in patients under 20 years where there are severe symptoms or where the blood-pressure is unduly high. In older people the general condition is often very good and, even without operation, the chances of survival into middle or late life are much better. It should not be forgotten that the development of atheromatous changes in the aorta as years advance makes surgery more difficult and may preclude it completely. In the cyanotic group of heart lesions, however, there need be few qualms about advocating surgery, if it can be undertaken, since the prognosis is so bad and there is no alternative treatment. The basic lesion in all types consists of lack of blood-flow to the lungs, and this is usually produced by stenosis or obstruction in the region of the pulmonary trunk. The surgical remedy consists in an operation which provides an anastomosis or artificial ductus between a systemic and pulmonary arterial trunk. Fallot's tetralogy is the best known and most common form of cyanotic disease which has responded well to the Blalock-Taussig operation. The suitable case for surgery is a child who is cyanosed soon after birth and has a high red-cell count. Size and intelligence are usually normal, though the child is under weight. The main disability appears on exertion when even a short walk of 40–50 yards is as much as can be managed without distress. On clinical examination the heart is usually small and shows the classical "sabot" shape in only a third of the cases. The pulmonary shadows are diminished in size and pulsation. Diagnosis is often straightforward, but there are instances in which cardiac catheterisation and cardio-angiography are needed in order to establish the nature of the lesion. Deaths are inevitable with any form of surgery in this condition, and a mortality-rate of 16% is probably the lowest that can be achieved at present. The results in those who survive are, however, remarkably gratifying, and there seems to be little, if any, ill effect from the newly constituted ductus.

Mr. **Holmes Sellors** felt that all cases of acyanotic ductus should be regarded as potential candidates for surgery, though clearly extreme youth or old age or other factors might modify this outlook. The apparent lack of symptoms in many cases does not necessarily mean that the patient is suffering from no disability, and in nearly every instance a condition of cardiac invalidism is established as a result of knowing that an abnormal heart condition exists. The low mortality of the operation of ligature of the ductus and the excellent results that are obtained are most gratifying. Recanalisation of the channel, which is said to occur fairly often, is probably not as great a danger as has been suggested though fear of its occurrence has led some surgeons to divide the ductus and oversew the cut ends.

Coarctation is not always a simple lesion, and associated cardiac lesions are not unknown. Crafoord's operation, in which the stricture is excised and a junction made between the cut ends of the aorta, is the procedure of choice, but may have to be modified if unexpected disproportions in the region of the stenosis are found. The general fitness of many young patients with this condition is often remarkable, and it is felt that surgery should only be undertaken when the symptoms are severe.

In pulmonary stenosis the form of operation has not been finally settled though the results of the Blalock procedure have been satisfactory. In Pott's operation a small anastomosis with a lumen of 4-mm. diameter is constructed between the left pulmonary artery and the aorta just below the arch, and good results have been recorded. More recently, if the stenosis has been shown to lie at the pulmonary valve deliberate division of this structure has been successful.

Mr. **Brock** described his experiences in cyanotic heart conditions and emphasised the urgency of their relief in children. The disability is often so severe as to make life barely tolerable, but a successful operation leads to dramatic recovery. The risks of surgery are certainly worth taking.

Dr. **A. Rae Gilchrist** has observed over 100 cases of patent ductus and considers that the lesion is usually an isolated one and amenable to treatment. Early recognition is important, and operation can be considered at the age of 7. In the cyanotic group the difficulties of operation are considerable, but good results in his own patients have been achieved by Pott's operation.

Upper Respiratory Disease and the Lung

Infection of the paranasal sinuses, Dr. **W. Paton Philip** said, often results in atelectasis of a lobe or segment of a lobe, most commonly the right and left lower lobes, and right middle lobe. The atelectasis is often transient, but recurs unless the sinus infection is successfully treated. Among an average of 2375 new cases referred to an outpatient chest clinic each year, approximately 372 cases of sinus infection with atelectasis were found: these patients were referred because of a history of cough, rise of temperature, or (most frequently) recurrent attacks of "pneumonia." In treating the sinus infection, Dr. Philip has found short-wave diathermy of the greatest value, though in many cases antrum puncture and Caldwell-Luc procedures are necessary. Prolonged and energetic treatment is essential for if the condition goes unrelieved, it may progress to frank bronchiectasis.

Dr. **Trail** agreed that there is a strong correlation between sinus infection and bronchiectasis, but was doubtful as to which comes first. In bronchiectasis he said, it is always the *two lower lobes, the right middle* lobe, or the lingula that are involved—never the upper lobes unless these have been affected by a previous lung abscess. Experimentally, vitamin deficiency during pregnancy causes maldevelopment of the finer bronchioles and this finding deserves further attention. Dr. **F. H Young** made three points:

> (1) In a recent case, an X-ray film of the sinuses was taken immediately after a bronchogram, and this showed iodised oil in the antrum. There is therefore no doubt that infection in the lung can be transferred to the sinuses, and probably in most cases there is a vicious circle of sinus-lung-sinus infection.
>
> (2) Removal of tonsils and adenoids before the age of 4 may predispose to sinus infection.
>
> (3) Can it be assumed that, if the antra are clear, the other sinuses are also uninfected ?

Dr. **Philip** thought that when the antra are shown to be clear it is probably unnecessary to exclude infection in the other sinuses.

Treatment of Pneumonia

Dr. **Lindsey Batten** wondered whether lobar pneumonia has changed its character during the last thirty years; his own impression is that it was already becoming milder before the advent of chemotherapy. At and children of Central Europe, where the daily milk ration is barely $2\frac{1}{2}$ oz.

The most interesting and certainly the most provocative paper of the meeting—*Investigations in Germany on Wheat Flour of Various Extractions as a Source of Protein for Growing Children*—was read by Miss E. M. WIDDOWSON, PH.D., who described her experiments on 150 children of a Duisberg orphanage fed on different kinds of bread. The children, who were divided into five similar groups, had the ordinary German rations, except cereals, and in addition as much of the bread under test as they liked. Each group received bread made from flour of different extraction, some of the bread being enriched with B vitamins and iron.

The flours were (1) 100% extraction; (2) 85% extraction; (3) 70% extraction; (4) 70% extraction, enriched with as much vitamin B_1, riboflavine, nicotinic acid, and iron as is present in 100% extraction flour; and (5) 70% extraction enriched with the B vitamins and iron present in flour of 85% extraction. The diet was also supplemented with calcium carbonate and vitamins A, D, and C in sufficient amounts. At the beginning of the test all the children were under weight and under height. Before the test the children were examined clinically; their hæmoglobin and hæmatocrit values were determined, their bones and gastro-intestinal tract were radiographed, and records were made of their height, weight, and dental condition. The amount of bread consumed varied considerably, but averaged 800 grammes daily, this amount providing 2000 calories. The bread formed the bulk of the protein consumed, only 7–8 grammes of protein a day being derived from animal sources.

At the end of a year no difference was found in the health and general condition of the five different groups of children. Dr. Widdowson was careful to point out that this experiment does *not* prove that white bread is as good as brown for children; but unfortunately some newspapers ignored her statement that this was proved true only under the particular conditions of this experiment and not under all conditions. She afterwards showed five of the German children who participated in the test.

Dr. L. E. GLYNN, speaking on Protein Deficiency and Liver Disease, outlined the results of experimental protein deficiency in animals. These are increased susceptibility of the liver to chemical poisons, such as chloroform and carbon tetrachloride; gross fatty infiltration of the liver, leading to cirrhosis if the deficiency is continued long enough; and massive necrosis of the liver if the protein deficiency is accompanied by vitamin-E deficiency. Dr. Glynn discussed the part played by the sulphur-containing amino-acids, methionine and cystine, in protecting the liver against chemical damage and fatty infiltration.

Other Subjects

Professor SANTOS (Portugal) read a paper on Disturbances of Metabolism and the Neuro-endocrine System after Psychic Trauma during the Second World War.

A film on agenised flour and canine hysteria was shown by Sir EDWARD MELLANBY, F.R.S. This was followed by a film, produced by the staff of the Rowett Institute, on lambing in relation to the feeding of the pregnant ewe. This demonstrated very clearly that when ewes are given a diet low in protein the result is an increase in stillbirths and neonatal mortality. Dr. GILLMAN (Johannesburg) said that he had made similar observations on maternal diet and the newborn among the native population of South Africa.

The recent purification of the anti-pernicious-anæmia factor (vitamin B_{12}) by Lester Smith was explained in detail, and the results of clinical trials with it were graphically demonstrated by Dr. C. C. UNGLEY. Other exhibits illustrated the effect of diet on resistance to tuberculous infection (Dr. S. R. SENGUPTA), blindness in cattle resulting from vitamin-A deficiency (Mr. T. MOORE, D.SC., and colleagues), the results of combined deficiency of vitamin E and protein in rats (Dr. MOORE), and the effect of chronic partial vitamin-C deficiency on muscles and joints in guineapigs (Dr. E. KODICEK and Mr. P. D. F. MURRAY, D.SC.).

DISEASES OF THE CHEST

President: Dr. R. R. TRAIL

Bronchial Carcinoma

The main emphasis here was on avoidance of delay in establishing the diagnosis. The high incidence of bronchial carcinoma, and the realisation that early cases can be successfully treated, should make the profession more alive to the possibility of its presence.

Mr. R. C. BROCK pointed out that the early symptoms may easily be overlooked or attributed to more innocent conditions. Cough, the earliest and most prominent symptom, is often put down to smoking or influenza. Hæmoptysis, pain, and signs of infection are other early features. In any suspected case radiography is essential, and bronchoscopy may confirm the diagnosis. The one form of treatment that has proved its worth is radical surgical excision, but unfortunately only a small proportion of sufferers are suitable for surgery. Mainly through earlier recognition, an original operability-rate of 8% has lately increased to 11% in 666 cases and reached 21% in the last year. Of 96 patients on whom excision was practised 78 survived, and of these 50 are still living. The type of operation is one in which the hilar structures are secured individually and the lung and glands removed. Recent developments, such as dividing the vessels intrapericardially, have extended the scope, and a more complete clearance of the mediastinal tissues, in the form of a block-dissection-pneumonectomy, has obvious possibilities.

Mr. G. A. MASON provided figures from an experience of 1000 cases. Of these 353 were explored operatively and 202 were found suitable for excision, giving an operability-rate of 20%. Analysis of early symptoms shows that cough and pain are the most common initial features, followed by dyspnœa, lassitude, and hæmoptysis. The delay between early symptoms and diagnosis is assessed at over eight months, and of this delay the medical profession can be held responsible for at least half.

The prominence given to surgery as the only form of treatment was balanced by Dr. E. L. G. HILTON's remarks on radiotherapy. It is popularly held that a patient excluded from surgery should be referred for deep X-ray therapy, but many patients recommended for this form of treatment are quite unsuitable. There must be careful selection, and out of 360 patients seen in the past seven years only 213 were accepted for therapy. Also therapy can be divided into palliative and radical forms, so that strictly only patients accepted for radical treatment (89 in this series) should be included in assessing the value of radiotherapy. Of those radically treated, some return to work and survive for an appreciable period in comfort. Problems of dosage in the depths of the chest and the inadvisability of using therapy in the presence of sepsis have to be considered, but patients should not be made ill by treatment, and after two or three weeks they show a steady increase in weight and general improvement.

Dr. TRAIL mentioned the periodic character of the cough in the early stages and how there is often a steady decrease in the intervals between coughing bouts. Mr. RONALD EDWARDS pointed out that the incidence of bronchial cancer is higher than that of gastric cancer, and only just below that of mammary growths. Dr. F. H. YOUNG said that pneumonectomy is not followed by gross disability, and physicians need not worry about the effects. Important though radiography may be in diagnosis, the first positive evidence of malignancy may come from bronchoscopy.

Special Articles

SCIENTIFIC INFORMATION

THE ROYAL SOCIETY'S CONFERENCE

In 1946 the Royal Society held an Empire Scientific Conference in London, and about the same time a British Commonwealth Scientific Official Conference was convened to consider the best means of ensuring collaboration between civil government scientific organisations of the Commonwealth. These two conferences thought that certain aspects of this subject needed more detailed examination, and the Royal Society therefore resolved to call another conference to which representatives of the Dominions and Colonies, and observers from the United States, should be invited, and at which the interests of scientists as users of scientific information should be especially considered, and the question of abstracting services examined.

This second conference was held in London from June 21 to July 2; but much-work had previously been done by the Royal Society's officers and by steering committees: no fewer than 46 papers, some very long, had been circulated before the opening day.

The plan of the conference was, briefly, that there should be four main sections, that each section should hold two plenary sessions, and that detailed work should be done by working parties within each section. At the first plenary session the agenda already drawn up for the working parties was approved or modified, and the composition of the working parties decided; at the second plenary session the recommendations of the working parties were reviewed and approved. The four sections were concerned with (1) publication and distribution of papers reporting original work; (2) abstracting services; (3) indexing and other library services; and (4) reviews, annual reports, &c. A session of the full conference to approve the final form of the recommendations for submission to the council of the Royal Society was held on the last day, and a closing session at the very end.

In welcoming the delegates, Sir Robert Robinson, P.R.S., explained that the conference was concerned with the sciences, but not with social science or the "so-called humanities." But he protested against the term "humanities" when, as so often, it is used to represent something to which science cannot attain. He made the point that science is concerned with human welfare and with spiritual values. Speaking of publication, he recalled Faraday's opinion that the research-worker should do three things: begin his research, end it, and publish it. At present the amount of money spent on publication of results of scientific inquiry was less than 1% (more probably $^1/_8$ to $^1/_2$%) of the amount spent on the research itself. This could well be increased, since publication is so essential and important a part of the spread of scientific knowledge.

After Dr. E. Marsden, of New Zealand, had emphasised the importance of speed in the spread of scientific information, in relation to economic development, Sir Edward Appleton, F.R.S., made a vigorous appeal for some system by which scientists could receive the information they want, sifted from the enormous mass of literature now produced. A man doing nothing but read current papers on fundamental science for 8 hours each day would be 10 years behind after the first year of work, yet "scientists live chiefly on the printed word." The scientist must get what he wants quickly and in the right form, and for Sir Edward this means reprints of the relevant original papers, and prompt short abstracts of related subjects. The whole subject of scientific literature is of the very greatest importance.

Sir Henry Tizard, F.R.S., put forward another point of view—that of the scientists rather isolated from the main centres of investigation either in Britain or the Dominions, and especially, perhaps, in the Colonies. The great need is to get what is already known across to those who need it but who cannot have that easy access to literature or to other scientists which is a feature of the big institutions.

BACKGROUND INFORMATION

One feature of great interest in this conference was the use of questionaries, two of which had been circulated several weeks previously, to various individual scientists and organisations. These questionaries had been carefully compiled. One, addressed to individual scientists, was designed by Prof. J. D. Bernal, F.R.S., "to find out in as much detail as is practical the habits of scientific workers in 'searching the literature'." Many questions were asked, and opinions, as well as statements of reading habits, were invited. The analysis of the results comprises some 30 pages of the paper issued on the subject, and required a great effort by a large number of people. The questionary was distributed to 8 scientists working for the Medical Research Council, and to 200 scientists engaged in non-medical work; the evidence indicates that in assiduity of reading the Medical Research Council led the field by several lengths, with 20·4 papers looked at, per person per week, against 10·5 for the (Cambridge) runners-up, and with 7·4 studied, against 4·8 at Cambridge. Rothamsted, the Department of Scientific and Industrial Research, and industrial scientists (to continue the metaphor) also ran. Between 82% and 100% of the scientists who answered the questionary used abstracts in the course of their scientific work. As Professor Bernal remarked in introducing his report on this interesting piece of operational research, the general trend of the replies indicated the need for more reviews, more reprints, and better library services.

The questionary addressed by Sir David Chadwick to various abstracting agencies sought information on organisation and technique, but also contained questions relating to the needs of users of abstracts and the quality and scope of abstracts provided for them. The replies indicated substantial differences in content and method. Some abstracting organisations aim to cover all papers in their fields, usually providing short objective abstracts whose purpose is chiefly to help readers to decide which original papers they should read. Other organisations adopt a selective method, abstracting only the more important papers on their subjects, and usually providing abstracts containing more detail than those of the first group. The needs of the readers of the abstracts issued in the various fields of science should, and indeed usually do, determine the types of abstracts provided. Certain abstracting agencies of long standing collaborate to produce abstracts of common interest; for instance, besides producing their own separate publications, the Commonwealth Mycological Institute and the Bureau of Hygiene and Tropical Diseases jointly produce the *Annotated Bibliography of Medical Mycology*. Some abstracting agencies provide information services in addition to their published matter. Some are sponsored and supported by Commonwealth governments; others are attached to societies.

PUBLICATION AND DISTRIBUTION

Professor Bernal drew attention to the plethora of material published and the confusion as to distribution which the present system entails. He wished, like Sir Edward Appleton, to obtain for the scientist the maximum of relevant information in the minimum of time and at the minimum cost. His proposals have unfortunately been misunderstood by some people outside the conference: he would continue to make use of existing agencies—societies, editors, and referees—but lays emphasis on the desirability of publishing papers that time the problem was not to cure a self-limited disease but to sustain the patient's resistance until he recovered. The length of the illness was all-important, and exhaustion the danger most feared. Rest, nourishment, and economy of exertion were first objectives, and expert nursing in hospital the obvious means. Chemotherapy, by greatly shortening the course of fever and toxæmia, has largely eliminated the danger of exhaustion in those not handicapped by age or serious incidental disability. Endurance, as a rule, is scarcely in doubt, and the means to secure it thus lose their dominating importance. Home, not hospital, may be the place of choice, and the management of pneumonia at home thus assumes a new importance. Many details of management, however, are still open to discussion—e.g., the temperature of the room and relative importance of ventilation and warmth; the allocation of priority among sleep, food, and drugs; hot, tepid, or cold water for sponging; the patient's position in bed; the choice and dosage of drugs for relief of pain and cough, for sleep, and as aperients; the usefulness or futility of poultices; the place of oxygen and of cardiac or respiratory stimulants in treatment. Chemotherapy is not yet, and is perhaps not to be, standardised. No close agreement appears between recent authorities on the choice or dosage of sulphonamides; the precise place of penicillin, and even the method of administration, have probably still to be determined. The considerable minority of pneumonias, benign or virulent, which are untouched by chemotherapy, must not be forgotten. Apart from trial and error their recognition depends largely on the help of the pathologists, who may give warning of dangers not otherwise to be foreseen and can greatly increase the possibilities of intelligent therapeutic tactics.

Dr. Young also thought that pneumonia was becoming less virulent before the introduction of sulphonamides—judging by the decreased number of cases visited in consultant practice. Dr. Trail said that rusty sputum is less commonly seen nowadays, though the pneumococcus is still the causal agent in the vast majority of cases. Dr. Batten attributed this to cure of the pneumonia before any sputum, rusty or otherwise, is produced.

OTORHINOLARYNGOLOGY

President: Mr. V. E. Negus

The Sphenoidal Sinus

The sphenoidal sinus is out of sight and out of mind. But only a thin sheet of bone separates it from very important structures, and where there are dehiscences the mucosa may actually evaginate and come into direct contact with these structures. Thus the symptoms of infection may be very varied. Air exchange inside the sinus is slow and evaporation slight, and the glands of its mucosa are therefore sparse. But the mucous membrane around the ostium on the nasal side is thick and readily swells; which means that blockage of the opening can usually be overcome by shrinkage there. Recalling these facts, Dr. Arthur W. Proetz (St. Louis, U.S.A.) said that the changes in sinus mucous membranes caused by infection and allergy are more fully reversible than was thought, and cilia will persist even on a very chronically infected and thickened mucosa. In treating sinuses great care must be taken to preserve the natural action of the cilia, avoiding destruction of mucous membrane, especially at the ostium. Sphenoiditis on the whole is of low grade; hyperplasia is restricted and irreversible changes are rare. In treatment the congestion should be reduced by displacement therapy, using $^{1}/_{4}$% ephedrine and continuing for ten days; antiseptics added to the fluid are probably of no value. Fulminant cases (which are rare) require chemotherapy, and surgery may be necessary both in these and in chronic cases not reacting to conservative measures. Dr. Proetz believes in making a narrow vertical oblong opening through the inner part of the anterior wall, well medial to the ostium and leaving it untouched. The middle turbinate is usually left in situ, but he does not object to removal of part of it if it is found to obstruct the surgeon's view.

Mr. F. C. W. Capps, who fully agreed about the need for a conservative attitude, said that, while acute sphenoiditis is rare, chronic infection is commoner; and here the treatment of the associated posterior ethmoiditis usually suffices. Operating in acute cases he enlarges the natural opening downwards, but often a partial middle turbinectomy is advisable. Less severe cases can be treated by washing out the sphenoid via the normal ostium. In his opinion retrobulbar neuritis is seldom improved by operating on the sphenoid. Dr. T. C. Graves stressed the relationship between sphenoidal sinus infection and mental disease; but Mr. J. C. Hogg has found the treatment of sphenoidal sinusitis disappointing in mental cases. Aspiration of the sinus, he said, is often essential to confirm the diagnosis.

At the end of the discussion Mr. Capps said he was glad to feel that there was general agreement as to treatment. He summed it up as: for acute cases, chemotherapy, and drainage from the sphenoidal sinus by suction or by enlarging the normal ostium; for chronic cases, conservative measures such as displacement therapy, followed (if they fail) by operation as described by Proetz.

Poliomyelitis and Tonsillectomy

Dr. A. M. McFarlan told how, 9–14 days after tonsillectomy, five children in one family developed bulbar paralysis of which three died. The operation apparently converted a symptomless poliomyelitis infection into a highly fatal form of the disease. Of cases of poliomyelitis developing within 30 days of tonsillectomy an unusually high proportion are bulbar, and in monkeys introduction of poliomyelitis virus by the tonsils often leads to bulbar paralysis. Histological studies have shown that in man the pharynx is a favourable portal of entry for the poliomyelitis virus, and these findings are in accordance with the idea that there may be a causal relation between tonsillectomy and bulbar poliomyelitis. In Dr. McFarlan's opinion there is very little evidence that recent tonsillectomy renders children more liable to infantile paralysis, but it seems to increase the risk of the disease being of the bulbar type. The risk is greatest during epidemics, when the virus is spread widely through the population, and at such times postponement of tonsillectomy can be expected to eliminate some cases of bulbar paralysis.

Dr. J. Alison Glover felt that the risks of tonsillectomy are definitely increased during an epidemic of poliomyelitis and that they outweigh the harm likely to be done by postponing operation. Mr. G. Bateman said that there is no unanimity among ear, nose, and throat surgeons in the United States on this subject. He thought that there probably is some increased risk of the bulbar type arising, but there are also disadvantages in postponing the tonsil and adenoid operation, including prolongation of general malaise and the danger of complications. He suggested the use of isolation cubicles. Mr. Negus pointed out that statistics will show the increased risk of poliomyelitis, but not the various troubles caused by not doing the operation. Major-General E. A. Noyes (U.S.A.) stated that the policy of the United States Army has been to stop tonsil and adenoid operations during epidemics of poliomyelitis.

In answer to Mr. Hogg, Dr. McFarlan said there is no evidence that dental or other operations increase the risk. He was strongly in favour of cubicles for ear, nose, and throat cases.

(*To be concluded*)

refinement, or extension of present-day methods of spreading information. Subjects which needed consideration were discussed at some length, and recommendations were made to which the attention of the Royal Society was invited. As the arguments were stated and restated it became evident to some, if not to all, delegates that the sciences represented are so different that procedures suitable to one are by no means always suitable to another. This fact was responsible for some confusion of thought and much vigorous argument, and one of the valuable results of the conference was that the particular needs of many branches of science were stated. When the recommendations are published in their final form, readers will be able to see how far they can be applied to medicine.

In winding up the conference at the final session, Sir **ROBERT ROBINSON** referred to the resolution that the Royal Society be invited to set up a standing committee on scientific information services to implement the recommendations made, and added the rider that funds would be needed for this purpose, and that they must presumably come from national sources Mr. **SAUNDERSON**, on behalf of the Dominions, complimented the Royal Society on the efficiency with which the conference had been conducted, and Mr. D. W. **BRONK** (representing the U.S. National Academy of Sciences) spoke of the need for internationalism in science and in scientific journals. Tributes were paid to Professor Bernal and the editors of the other sections, whose interest was inspired solely by the desire to advance the cause of science.

MEDICAL PRACTICES COMMITTEES

THE Minister of Health has appointed the following as members of the Medical Practices Committee, constituted under the National Health Service Act:

Dr. W. E. **DORNAN** (Sheffield), chairman; Dr. J. A. **PRIDHAM** (Weymouth); Dr. **ANNIS GILLIE** (London); Dr. J. F. **MURPHY** (London); Dr. D. T. **MACDONALD** (Belford, Northumberland); Dr. D. B. **EVANS** (Wrexham); Dr. P. V. **ANDERSON** (Shildon, Co. Durham); Mr. **HENRY LESSER**, chairman of London executive council; and Mr. R. **WILBERFORCE** (London), barrister-at-law.

The committee's functions include the consideration of applications by general practitioners to join the National Health Service in England and Wales, and to decide whether further doctors are needed in the public service in the area to which the application refers. They will also, on request, advise doctors whether transactions into which they propose to enter comply with the provisions of the Act prohibiting the sale of goodwill. The committee's offices will be at Devonshire House, Mayfair Place, Piccadilly, London, W.1.

SCOTLAND

The Secretary of State for Scotland has set up, under the National Health Service (Scotland) Act, a similar committee with the following members:

Dr. A. F. **WILKIE MILLAR** (Edinburgh), chairman; Dr. I. D. **GRANT** (Glasgow); Dr. W. **JOPE** (High Blantyre, Lanarkshire); Dr. J. R. **ANDERSON** (Fortrose); Sir **WILLIAM MARSHALL**, chairman of Lanarkshire executive council; and Mr. H. A. **SHEWAN** (Edinburgh), advocate.

The committee's offices are at 12, Carlton Terrace, Edinburgh, 7.

Disabilities

8. PULMONARY TUBERCULOSIS

ANY serious long-continued illness such as pulmonary tuberculosis is bound to impose some modification of outlook and of behaviour on even the least impressionable of patients. In the early stages of the disease the consciousness of the fact that one is "T.B." pervades almost every waking thought and imbues the outlook with anxiety or actual fear. In retrospect, I can well remember what an intensive process of adjustment I had to undergo when I was told I was suffering from pulmonary tuberculosis. Career, job, financial prospects, social relationships, and a goodly measure of happiness seemed closely bound up with physical well-being; and all were being plunged into the melting-pot at a time when I was far from being at my best either physically or mentally and when my knowledge of the true facts regarding my health was fragmentary and even distorted.

The tendency at this time is for the patient to speculate endlessly on every possible aspect of his illness. Will he get better? How long will it take? Will he become a chronic invalid dependent on others? How long will his salary continue? Will he lose his job? What will other people think? Has he already infected other members of his family? What will happen to them now and in the future, &c., &c.? In short, he is at this time in need of as much material reassurance as he can get—not the "Don't worry, everything is going to be all right" type of thing but good solid reassurance on specific points such as: "Your salary will continue as before," or "The tuberculosis allowance will be so much a week, supplemented by so much towards rent and other expenses," or "Peter and Marjorie were X-rayed yesterday and they are all right."

Even if the outlook is less satisfactory the patient will derive some satisfaction from knowing the worst *provided he feels confident that whatever possible is being done to remedy matters.* He himself will be glad to escape the actual responsibility of settling family, business, and social affairs. The impulse towards escapism is, indeed, distinctly strong in the early stages and some temporary retreat from reality is not a bad thing; personally I shall always be grateful to the author of a long, rambling, and entrancing novel which swept me off to another world for hours at a time when the real world was grey and full of menace.

In the early stages of his illness, therefore, I should say the tuberculous patient requires three things to tide him over his psychological crisis:

(1) Material reassurance on specific points which are causing him anxiety and concern.

(2) Helpful advice regarding his many problems from someone (preferably his physician) on whom he feels he can rely.

(3) Some harmless avenue of escape to divert his attention from his various troubles, both immediate and prospective.

When, this first, somewhat intensive, phase of adjustment is over, there ensues a period of chronic dissatisfaction. Recovery is still a long way off and apt to recede even further with little or no warning; problems have had time to harden and the patient time to appreciate his own incapacity to solve them while he remains an invalid; the unpleasant effects of tuberculous toxæmia may still be present, and positive signs of advancement in health are distressingly slow in appearing; the sense of being "cut off" and "out of things" persists uncomfortably and the predominant inclination is still to get back as quickly as possible not only to normal life but to the pristine stage of full activity.

* * *

As time goes on the patient becomes more at ease with his environment and somewhat less impatient with his enforced limitations. Gradually his attention becomes caught up with smaller, more immediate interests. When bigger and more unpleasant issues loom up, and depression threatens to close in, a new departure along some hitherto unexplored path often helps to keep interest fresh and alive. Writing instead of reading, doing something with the hands such as toy-making, rug-making, or even jig-saw puzzles, all help to provide concentration on the immediate and practical to the exclusion of greater but more remote problems. At this separately so that the worker may receive what he wants and no more.

The conclusions and recommendations of the section were extensive. They related partly to an educational campaign, which should be undertaken by all learned societies, to improve the standard of scientific papers. The aim should be to produce the best papers as quickly and in as short a form as possible, and at the lowest effective price; but the emphasis should be on quality. The working parties made practical suggestions on these points. They also made recommendations relating to the issue of short versions of papers when the full versions are too long to interest more than a few persons; in such cases the complete experimental details could be deposited in some stated place, to be consulted or copied on request, but not to be printed. Consultations between editorial boards of journals having similar interests were advocated, and better reprint and library services, with attention to the need for making papers more rapidly available than they are at present to readers in the Commonwealth. More controversial was the suggested *production of fairly full précis by the authors of original* papers, which might be published separately in "federated précis journals"; but the distinction between these and informative abstracts was admittedly indefinite. Opinion on this suggestion was divided; many delegates could not see much practical value in the proposal, which was adopted on a bare majority vote only.

ABSTRACTING SERVICES

Sir David Chadwick, for many years secretary of the Imperial (now Commonwealth) Agricultural Bureaux, said that abstracts should serve the needs of scientists, and the readers should constantly be kept in mind. *Abstracts are not bibliographies, and numbers are not so important as quality, accuracy, and general cover.* Abstracters must be in close touch with those they serve, and should cast the abstracts in a form which fits the needs of the particular readers for whom they cater. There is some overlap between different existing abstracting services, but this is not an important matter.

Sir Alfred Egerton, SEC.R.S., commented on the importance of good indexes in abstracting journals.

The point of view of agricultural workers in the tropics was put by Mr. B. A. Keen, F.R.S., who said that their very diverse needs are well served by the Commonwealth Agricultural Bureaux. They include on the one hand scientists who require abstracts of information on abstruse chemical and physical subjects, and on the other hand non-specialist officers whose work is in the field, remote from libraries, but who must keep in touch with the broad trends of research so that they may apply modern knowledge to their everyday problems. These field workers have neither opportunity nor time to look through a flood of literature; they need periodical reviews, which could perhaps be produced by the bureaux, but organised by some institution half-way between themselves and the bureaux which could also maintain a flow of information in the reverse direction, keeping the bureaux informed of the activities and problems of the field workers.

Mr. J. E. Cummins, representing Australian scientists, suggested that the preparation of abstracts of important papers must eventually be a responsibility of the authors of the original papers. Authors should provide their own abstracts, and these should be sent by the editors of the journals concerned to such organisations as their subjects indicate to be published in abstracting journals. Dr. C. H. Desch pointed out that different abstracts of the same paper, stressing different aspects, are needed by different readers.

Towards the end of the session, Professor Bernal gave his opinion that scientists should not be obliged to read more than two or three abstract journals to cover their own special work and related subjects. Abstracting organisations could well become centres for services distributing reprints.

When the working parties reported their conclusions and recommendations at the second plenary session, it was evident that there was agreement on many basic principles of abstracting. For instance, it was recognised that as the needs of different categories of readers differ, so the abstracts of a single original paper should differ. This being so, it is undesirable to suggest that only one abstract be made of any paper; the particular needs of readers are paramount in abstracting. Some institutions prefer abstracts which are no more than statements of fact, but others are convinced that critical comments, by expert abstracters competent to make such comments, may greatly add to the value of an abstract. The formation of a standing consultative committee of representatives of abstracting organisations was suggested, this committee to have only advisory functions. In this way mutual cooperation might be advanced, with general benefit. *Abstracting is an important branch of the* scientific information services, and the editors of abstracting journals should choose their material, and their abstracters, with care, and should ensure that the accounts given of published papers are factually accurate.

INDEXES AND REVIEWS

Section 3 concerned itself with indexing and other library services, and made a large number of recommendations on such matters as systems of classification, methods of reproducing copies of papers, the training and status of librarians, and other subjects.

In section 4 Sir Edward Salisbury, SEC.R.S., said that the writers of reviews should take into account the readers for whom they are composed, and should decide whether the reviews are to be objective statements of work done, or critical and selective accounts of significant work. The same point was taken up by Prof. Munro Fox, F.R.S., editor of *Biological Reviews*, who thought that critical reviews may be synthetic in that they may crystallise out new and fruitful ideas. The difficulty is to get them written by competent scientists, who are usually working to full capacity already. There is also a place for more comprehensive summaries of recent work, which, while still retaining a critical outlook, serve to guide especially those who are starting new research. This also was the view of Mr. A. King, who thought that in these days of increasing specialisation and team-work reviews are more necessary than ever before. Reviews may be written for the general public, for interested laymen, for general scientists, or for specialists.

The importance of reviews to scientists isolated from libraries and centres of research was stressed by Mr. Hugh Saunderson, of Canada. Publication of papers contributed to "symposia," or of lectures in which the speakers sum up recent work, helps to solve this problem, but needs development.

Mr. L. J. F. Brimble (*Nature*) said that the choice of reviewers was most important, and that it is wise not to retain one reviewer too long on one subject; variety and change are essential, and foreign reviewers should be asked to write for British publications. The international point of view is essential.

Finally, Prof. Murray Luck, of the United States, wondered, gently, whether the spate of original papers would be replaced by a spate of reviews; but he was not unduly depressed about it, and agreed that reviews are needed.

CONCLUSION

The conference as a whole made no proposals for revolutionary change in existing practice, but many important suggestions were made for development, progress the author, feeling it imperative to add more recently acquired knowledge, was forced to dispatch his corrigenda up the same route. He rightly feared that the eventual date of publication would find many corrigenda breathlessly but vainly on the ascent, and his colleagues would remain unaware of these improvements. I cannot but think, however, how pleased I shall be to have a statutory public of senior officials for my articles. It is surely better to be read with distaste then to be completely ignored.

This recalls to my mind an incident in my humble service in His Majesty's Forces. My length of service and lack of any outstanding characteristics in my opinion warranted promotion. It merely remained to bring my name before those in authority. A recent circular had particularly stressed the chances of original thought and research available to all M.O.'s in the Service. Those who complained of lack of work were self-confessedly incapable of profiting by the material at hand. I forthwith took this to heart. My work was the inspection of a large number of men for pediculi pubis, an arthropod which as a backward student I had never seen, and, since the men I inspected had been thoroughly examined a few days previously, I did not expect to see now. However, watching the inguinal regions flicker like a moving picture past my field of vision, I sat casually visualising their owner's facial appearance. After the first few thousand I became remarkably proficient. The words of the circular came to my mind and I set down a few notes on my technique. Tables of frequency distribution and standard errors were to follow. Maybe, I thought, identity-card photographs and fingerprints would become things of the past. Spies could be recognised instantly. A short preliminary note was prepared for publication and submitted.

Alas, all that came of my patient work was a telegram dispatched with quite incredible promptitude, stating that the article was not, repeat not, to be published. My dreams of the new science of inguinal-phrenology were dashed to the ground and I ended my service with he same rank.

* * *

The poison pen of an anonymous-letter writer became busy in our hospital. At last his efforts could no longer be ignored; he alleged "something shocking in the woodshed." Suspicions all *pointed to one* man, whom I proceeded to interview. I had imagined myself something of a sleuth and by *no means unsuccessful* as a cross-examiner; but, try as I might, I could not penetrate his protestations of innocence. *Later the police* referred the specimens of handwriting to distant experts who quickly and confidently diagnosed that he, and only he, could have written the letters. I was amazed by this calligraphic certainty and by the speed by which a detective secured, in as many seconds as I had wasted minutes, a signed confession and complete retraction. Incidentally, we did not prosecute; the man resigned and showed his gratitude for leniency by writing openly to those in high places making unfavourable comment against our services.

* * *

Attending the B.M.A. Representative Meeting gave one a grand opportunity to visit Cambridge once more. To live again in college after nearly a quarter of a century is a wonderful experience. Apart from the delightful set of rooms, the marvellous cooking, and the service, there is the atmosphere, hard to describe but very real—something not apart from everyday life but an inspiration to live a full life, surrounded by beauty. To men in their formative years this contact with a society dedicated to learning as the ideal must have a profound and lasting effect, shaping their attitude to the world at large for the rest of their lives. Despite the many superficial changes the fundamentals are the same—to be afraid of nothing strange or new while keeping the best of the past; to be confident in the superiority of the mind while enjoying the things of the body; to be determined to give of your best to the material world but seeking inspiration, uninhibited by prejudice, in the spirit.

Letters to the Editor

BENEVOLENT FUND APPEAL

SIR,—Westmoreland Lodge has been opened as a residence for some of our beneficiaries; and we now need a sick bay or hostel where care and special attention can be given to residents during illness and in their declining years. This is a most urgent and pressing problem.

There recently appeared in the medical press the statement that the Medical Insurance Agency had entrusted to the Royal Medical Benevolent Fund £1000. I should like to amplify this. The cheque we actually received from the Medical Insurance Agency was for £1200. The agency gave full discretionary powers to the committee, though expressing the desire that £1000 be allocated to form the nucleus of a fund to establish proper provision for the sick and infirm. My committee, realising that the need is so very urgent, has allocated the whole of the gift of £1200, together with the income-tax which will be recoverable under this covenant payment, to form the nucleus of a special fund. With this magnificent opening I am making an appeal to the profession to enable us to complete the project. Whole-hearted approval has been shown of our determined efforts to give residential accommodation which we have been able to do through the generous bequest of the late Dr. Arthur Holdsworth Davis. We now ask the profession for the necessary financial support to establish a hostel for the sick and infirm.

Contributions should be marked "Westmoreland Lodge Sick Bay," and forwarded to 1, Balliol House, Manor Fields, Putney, London, S.W.15.

C. L. BATTESON
Honorary Treasurer,
Royal Medical Benevolent Fund.

SUPERNUMERARY NIPPLES AND NEUROSIS

SIR,—Dr. Harper's observations (June 12) may be extended in a curious way. Many years ago I was interested in the charming of warts. It is common knowledge that the application of the milky fluid from the broken stems of various plants is one of the many recommended cures. So is that of saliva.

My first attempt at charming was an encouraging success. When an intelligent boy of about 13 stretched out his hand for his case-sheet I noticed that it was covered with warts. There must have been at least 50 altogether, for I counted 10 large ones on the thumb alone. Most of us have used a thumb as a supernumerary nipple; and how else shall a cigarette or a pipe be regarded?

The boy, who had access to a chemical laboratory, had for some months tried several reagents, including strong acetic acid, without success, and now eagerly agreed to try my method. I took him on one side, and, after binding him to the utmost secrecy, told him to touch each wart with the tip of his wet tongue every morning the moment he awoke, before any food whatever had passed his lips, for then the saliva was peculiarly poisonous to warts; and in a month they would have gone. They went. By a subterfuge the boy had been weaned.

I related this success to the sister in charge of the school clinic, who asked if I thought that she could cure in the same way a boy of 8 whose many warts persisted in spite of all her treatment. I thought she might if she attended to the ritual properly. A month later she reported total failure, whereupon I sent for the boy and asked how he had carried out the instructions. He said that each morning he had got some spit on the tip of his finger and touched the warts with it. As for secrecy, he had only told his school-teacher, who had laughed mockingly. I looked grave, chided him for his slackness, and said that if he really wished to get rid of the warts he must steal a potato from his mother's store, halve it, touch each wart with the raw surface, and then bury the potato in the backyard by the light of the full moon—all in the greatest secrecy. At the end of a month the warts had disappeared. Another subtle weaning.

A sceptical colleague, a man in his fifties, amused by my fantastic stories, asked if the process would work stage the sufferer may begin to appreciate that although the larger satisfactions may have to be deferred for some time at least, life has still a good deal to offer on a somewhat lower plane. When interest is kept alive, even by matters of apparently trivial import, frustration and depression are largely kept at bay.

During this phase, therefore, the patient needs to be encouraged both to take an interest in his immediate environment and to become, as it were, a natural part of it. Hospital competitions, entertainments, and talks on the internal broadcasting system all combine to create a community feeling, and if the patient himself can take even a minor *active* rôle in such things his interest will be magnified and he will get to know and be more at ease with his surroundings. Some form of occupational therapy should also be undertaken—preferably of such a nature as to prove a lasting source of interest.

As recovery proceeds attention shifts once more from the comfortable and comforting minutiæ of the little sanatorium world to the realities of life outside. But there is no longer an impulse to rush back full tilt into the turmoil—the outside world now assumes a somewhat frightening aspect. Depending, of course, on the patient's temperament, the length of his illness, and the satisfactoriness of the result obtained, there is nearly always a lack of confidence, combined with an unwillingness to leave the safety of the harbour for the perils and buffetings of the high seas.

The patient now needs to be prompted to increase his range of activity and interests, and it is well to turn his gaze more and more in the direction of the outside world. Step by step this return towards normal life, modified by suitable precautions, should be encouraged, the patient gradually gaining confidence and losing his sense of incapacity and dependence.

After leaving the sanatorium confidence may return rather too quickly, and the danger then lies in succumbing to the temptation to resume full normal activity. In the sanatorium rest-hours and regular habits are accepted without question; outside they may lead to a raising of eyebrows, awkward questions, and general inconvenience. Usually the patient feels too well to experience any physical need to continue his routine and does not realise how thin may be the ice beneath him. There is even a perverse determination to prove to himself and others that he can do as much or more than the next man, in spite of his having had tuberculosis. Advice to go slow is quietly ignored, or may even be resented, according to its source.

A sharp lesson is often required at this stage to underline the fact that the ex-patient has limitations, and that it is better to carry part of the burden all the way than all of it for a short time only. This is not easy to realise; it may well be only after a relapse has occurred that its essential wisdom becomes clear.

* * *

From the foregoing it will be apparent that in pulmonary tuberculosis the emotional factor plays a highly significant part at all stages of the disease. The difficulty lies in securing an acceptance of limitation without developing an invalid outlook. The limitation may be relatively little or very considerable, and the optimum level of activity has to be determined in each case—largely by the patient himself regarding day-to-day matters.

One rather good way of looking at the problem is to regard oneself as entirely normal except for requiring considerably more rest than other people, and this is best secured by keeping to a regular routine. Anything causing undue tiredness should be noted and not allowed to happen again. Rest hours may not be sacred but they are certainly very important to the physical economy of the tuberculous patient, and the more he does the more important they become.

In England Now

A Running Commentary by Peripatetic Correspondents

AT Wimbledon today I studied nervous reaction to excitement on the Centre Court. A svelte case in front of me threw her head into her hands with each match-point, and at 40–30 would pull the lobe of her father's left ear, until it became quite ragged at the end of play. A man on the other side of me lost his chin in his collar with every rally. Somebody else stood up in frenzied passion just when the climax of a match was reached and yelled a protracted gibberish which sounded like the alphabet backwards. In the mixed-doubles I found mental solace in taking an occasional mouthful of the white tulle veil which formed the hat of a beautiful girl in front of me. By the end of the day her head was bare and I had acute indigestion.

* * *

Old Joe Honeysuckle, who "does" our garden, is a great believer in herbal remedies. "There'd be no need for this loan from Ameriky if people only knowed the treasures that lay under their feet," he said. "That there dock you're treadin' on, for instance. Tim Gurglethwaite had two boils on the back of his neck and tried all sorts of medicines and went time and again to the doctor, but they wouldn't go. I told him to dig up a dock root, boil it, and drink the water. They went, and they didn't come back. When I was a young man I once had a boil, and dock root got rid of it, and I've never had another since." "But," said I, thinking on post-hoc-propter-hoc lines, "I once had a couple of boils thirty years ago, and whatever I put on them then, and whatever I didn't put on them, must have cured them, because I've had none since." "Ah," replied Joe wisely, "but, you see, in my case I didn't put nothin' on them. I drank the water."

"Then there's broom tea," he added after a pause. "George Puddyphut came along one day to see me with three new cuts in his boots. 'What's wrong with your feet?' I asked him. 'I bin in hospital three weeks,' he said, 'and under the doctor afterwards. They tell me I've got lumbago and rheumatiz, and they can't do nothin' for me.' 'That's no lumbago nor rheumatiz,' I told him, 'that's dropsy.' And I showed him how to make broom tea to cure it. He come back a week later wearin' proper boots, and a week after that he went to work in leather gaiters."

Joe was a shepherd in his younger days, and it must have been from watching the vet. that he acquired his interest in experiments. Two sheep died, one of galloping consumption, the other of pneumonia. Joe put a piece of lung from each in separate jam-jars, dated and labelled them, and put them in the sunshine. After a while the tuberculous lung, according to Joe, was full of "little white germs," falling down like a snowstorm, and the lung became smaller and smaller till there wasn't none left, only water in the bottom of the jar. The other lung, the pneumonia one, stayed hard and didn't fall away to nothin'. "That shows," opined Joe, "that the two sheep died of different diseases, doesn't it?"

On another occasion Joe took a potato infested with wireworm and put it in a glass jar with a metal lid Long before the wireworms pupated, many small cocoons appeared on the walls of the jar, and from these hatched minute flies. "That," said Joe, "proves there was flies' eggs in the potato, don't it?" I pointed out that the cocoons were on the sides of the jar and not close to the potato; that he had pierced the metal lid with a hole large enough for the fly to enter and lay eggs; and that he had probably not sterilised the jar in the first instance. Joe looked reproachfully at me for criticising his scientific experiment, and stoutly maintained that it proved the folly of using artificial manures.

* * *

Some writers have expressed fears that the National Health Service Act may lead to censorship of medical articles. One learned and apparently prolific author has described the fate of his works when on military service. His communication passed from one senior officer to another in an ascending and vicious spiral; during this hospital at all. However, in spite of this early treatment in bed, the paralysis-rate of 0·36 per 1000 troops at Catterick Camp compares unfavourably with 0·12 in Eccles[6] and 0·06 in Glasgow[7] per 1000 persons over 15 years of age in 1947.

Southern General Hospital, Glasgow. G. JOLY DIXON.

ATTACK ON RHEUMATISM

SIR,—The many letters you have published under this heading have demonstrated the wide interest in the subject; but few have had any bearing on the aspect that was in my mind in the letter that I wrote at the outset. This stressed the importance of the general practitioner in the attack, and pointed out how he might be better trained for the important part he will always have to play. Probably the most important stage of all in the campaign is the recognition of the earliest signs and warnings, and of the influence of hygienic conditions, food, housing, occupation, psychological factors, &c., which come under the observation of the family doctor. The specialist in whatever branch seldom sees these in action; he sees only their effects. One may perhaps compare the rôle of the general practitioner to that of the politician who sees and is concerned with those causes which lead to war, while the specialist only comes into action when the conflict has begun or may even be far advanced. Too often the attempt to control and to remedy the resulting damage is only begun when it is too late. The orthopædist, for example, who might be called in at the earliest stages, is by many only supposed to be of service to devise splints and supports, or even to operate at the last stage in the disastrous history.

Let the family doctor and the medical student be taught the ætiological factors and the prodromal signs, so that if his efforts fail to prevent or cure he may recognise the moment to call in the colleague who has wider knowledge and experience, under whatever designation he may elect to practise, provided it is not a narrow specialty. The specialist with a limited outlook may be a danger rather than a help, and the last state of the patient be sans teeth, sans tonsils, sans money, sans everything which makes life worth living. The general practitioner should be assisted, not superseded, whenever possible.

Too often one hears a patient say: " Oh, my doctor takes no interest in rheumatism "—a deplorable reflection on the education which has failed to teach him that no disease or group of diseases touches medicine at so many points or needs a wider knowledge of medicine in general. On the other hand, many practitioners could make valuable contributions to our knowledge of the rheumatic diseases, both as to cause and treatment, from their wide observation and experience. I should like to hear more from them before this correspondence ceases. We are wandering too far from the highway into fascinating byways which may prove of little practical value.

Ashbourne. CHARLES W. BUCKLEY.

SCHOOL DOCTORS AND THE ACT

SIR,—Your correspondent " Father of Eight " asks " What is the position of school doctors under the Act? " He then proceeds to give not only the wrong answers to his own question but to make definitely misleading statements.

The Medical Officers of Schools Association, of which I was president from 1946 to 1948, asked the Governing Bodies Association to negotiate with the Ministry of Health on our behalf, and the result was a letter from the secretary of the Ministry of Health stating that for additional services not covered by the provision of general medical services, such as the carrying out of routine or special examinations and the giving of advice on general health matters to the school authorities, the school authorities would presumably wish to make some special payment to the doctor. This applied particularly to the part-time doctor, and a separate sentence was added for those public schools which employed whole-time doctors to the effect that if this doctor was receiving a whole-time salary from the school authorities, arrangements could be made with him to authorise payment of the appropriate remuneration due from the executive council direct to the school authorities. " In any event, these authorities will wish to remunerate such doctors for services provided outside the scope of the National Health Service, such as those referred to earlier." This has been confirmed by administrative memorandum no. 284 of June 18, 1948, from the Ministry of Education. This refers to the Minister of Health's circular to local education authorities, governing bodies of special schools and secondary schools with boarders, training colleges, &c., and says:

> " Where the doctor provides general medical care under the National Health Service in accordance with the arrangements set out in this memorandum, he will be paid by the Executive Council. He will not be entitled to charge any additional fees for these services, but it will be open to the authorities of the school or other residential educational establishment to pay him for, e.g., routine medical examinations made in particular cases at their request. If the doctor is receiving a whole-time salary from the school or establishment, he will be able to authorise the Executive Council to pay direct to his employers the fees due to him from the Council."

These quotations from official letters show that the verbal message that " Father of Eight " obtained from the Ministry of Health is, in the words of a popular comedian, " Not worth the paper it is written on."

The amount of extra work that the school medical officer has to do over and above just seeing after the sick is enormous if he really takes his duties seriously, and the Governing Bodies of Schools Association rightly appreciate that the labourer is worthy of his hire. I think " Father of Eight " will appreciate the justice of the Ministry of Health's and the Ministry of Education's official recommendations.

Rugby. R. E. SMITH.

LEUKÆMIA PRESENTING WITH NEUROLOGICAL MANIFESTATIONS

SIR,—Having read Dr. Gauld's article (June 19), and since only 5 out of 69 cases of leukæmia presented initially as a meningitis in the series of Schwaub and Weiss,[1] I feel it may be worth recording the following case, which also presented as meningitis.

A boy aged 4 years and 4 months, an only child of a healthy family and with no history of previous significant illness, was admitted to the Hospital for Sick Children, Great Ormond Street, under Dr. Sheldon, with the history that six days before admission he complained of a " nasty taste " which caused him to vomit once. Later the same day he knocked his head with no undue violence, but complained of the pain far longer than was thought usual for him; subsequently and up to admission he did not complain of any headache. Five days previously he had vomited twice in an effortless manner, and, becoming increasingly drowsy and listless, had vomited repeatedly. A dry cough had been noted for 3–4 days only.

Examination.—Normal size for age. Temp. 100°F; pulse-rate 110 per min.; respirations 36 per min., face flushed. Practically comatose, but consciousness varied and he responded to questions slowly. Enlarged tender glands in the posterior triangle of the neck, and smaller enlarged glands in the axillary, epitrochlear, and inguinal regions. Right side of chest bulging forwards slightly, and respirations irregular. Liver felt one finger-breadth below the costal margin; spleen just palpable. Flexion of the neck produced severe pain and rigidity; Kernig sign positive. Pupils constricted, but reacted to light. Some early papillœdema with engorged vessels; no choroid tubercles seen. No petechiæ or other abnormal physical signs.

Progress.—At first the child was thought to be suffering from *miliary tuberculosis* with accompanying meningitis, but the cerebrospinal fluid was normal in every respect. Next morning he complained of occipital, arm, and leg pain. The liver had enlarged to 2 finger-breadths and the spleen to one finger-breadth below the costal margin.

Until now a definite diagnosis had not been made, but a blood-count revealed acute lymphatic leukæmia, the blood-picture being as follows: red cells 3,300,000 per c.mm.; Hb 55% (7·7 g. per 100 ml.), white cells 820,000 per c.mm. (composed entirely of lymphocytes and lymphoblasts).

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[6] Sweetman, W. P. *Ibid*, p. 1172.

[7] Personal communication, Glasgow Public Health Department.

[1] Schwaub, R. S., Weiss, S. *Amer. J. med Sci.* 1935, 189, 766.

with him. He had had a wart on his shin for forty years which had defied treatment. Not being an acrobat, he said, he could not touch it with his tongue. Besides, he knew the thing was just spoof, and he had no faith. I assured him that in the circumstances it would work if he applied the saliva with his finger. Either his knowledge was insufficient or his faith greater than he knew, for the wart faded away.

I should have hesitated to put these experiences on record but for the fact that Dr. Millais Culpin has told me that in his early days at the London Hospital patients with warts were generally referred to a certain sister who charmed them away. Moreover, I have heard a leading *skin specialist declare his belief in the efficacy of* charms. If tissue change can indeed be thus induced, it is reasonable to suppose that corresponding emotional impulses may actually cause the warts. In my boyhood I was warned never to wash my hands in water in which eggs had been boiled, lest warts should result; and Wynne Parry has recorded[1] how a young woman's recurrent attacks of iridocyclitis were traced to mere contact of the unbroken skin with eggs. It is the old story of sexual prohibition in another disguise.

In his communication on bodily changes during abreaction Moody[2] carries the matter further; significant organic lesions have developed before his eyes as a result of deliberately provoked emotional stress, and the manifestations have borne a definite relation to the nature of the emotion. His observations support the less easily proved dramatic phenomena I described in an article on sympathetic disturbance in connexion with thoughts of death by hanging.[3]

Some day someone may link up the capricious wart with the variable facial pimple that announces the approach of a menstrual period, the acne that tells of a difficult adolescence, the stye that is supposed to yield to the magic touch of a wedding ring, and—who knows? —the malignancy that seems to hover about a chronically irritated nipple or mole. Irritation can come from within as well as from without.

Portsmouth. W. S. INMAN.

AFTERMATH OF A CAUDA-EQUINA LESION

SIR,—In the article on this subject in your Disabilities series (April 17, p. 608) the patient makes a plea for a very light calliper. For some time past I have been experimenting with a thin wall high-tensile steel tubing, which I have found most satisfactory. The tubing has an outside diameter of $^{3}/_{8}$ in. and a wall $^{21}/_{1000}$ in. thick. The steel is the kind used for golf-clubs, and it reduces the weight of the calliper by as much as two-thirds. The tubing is supplied by Messrs. Accles & Pollock, of Birmingham.

Physical Medicine Department,
General Hospital, Northampton.
T. K. DAVIDSON.

THE GEOGRAPHICAL ORIGIN OF NURSES

SIR,—Dr. Barnet Woolf's statistical demonstration (June 19) of where more recruits to nursing could be found is most interesting.

It may be worth while reminding ourselves once more that compulsory residence for nurses is a relic of the Nightingale rehabilitation of nursing in 1860 and afterwards. At that time young women of the type Florence Nightingale wanted could not have lived in the neighbourhood of most hospitals, and there was then no transport to bring them in from more respectable neighbourhoods. Florence Nightingale relied on the influence of the nurses' home to safeguard the respectability of the nurses.

In modern times one of the disadvantages of nursing as compared with other work is payment largely in kind. If the nurse were *paid a gross salary* so that she had more command over her earnings, it would be much easier to compare her position fairly with that of other students and employees. Girls living at home could contribute to the family income when necessary. Those for whom accommodation had to be found would enjoy a greater sense of freedom if they paid for it themselves.

London, W.2. G. B. CARTER.

FOR AND AGAINST MYANESIN

SIR,—A short while ago I wrote[1] saying I had never seen a thrombosis following 'Myanesin,' and I wondered whether this untoward effect could be due to errors of technique. It was kindly pointed out to me at the time by leading anæsthetists that I had been very lucky and that in time I must encounter this trouble.

I have now seen it—a thrombosis 12 in. long in the right arm, rendering the patient (who is perfectly recovered from her hysterectomy) unable to write, darn her husband's socks, or tolerate the contact of the arm with her body. Since seeing is believing I now apologise *to the anæsthetists for the suggestion that errors in* technique could be the cause of the thromboses.

London, W.1. KEITH VARTAN.

GROWTH-RETARDING FACTOR

SIR,—In their preliminary communication of May 15 on a growth-retarding factor in maize bran, Mr. Borrow and his colleagues gave an analysis of mice weights and of diets, but they made no mention of taking a peep inside their dwarf mice. Perhaps they have forgotten the history of thiourea? In 1941 New Zealand investigators reported retardation of growth in rats fed partly on rape or turnip seeds. Without a consideration of imbalance of amino-acids or multitudinous growth factors they labelled the seeds as possessing a goitrogen because their dwarfs had enlarged, cellular thyroid glands. Later they isolated the goitrogen thiourea from rape and turnip seeds. It seems essential, in the present work, to eliminate such a possibility before entering the unknown.

Regina General Hospital,
Saskatchewan.
N. G. B. McLETCHIE.

DECUBITUS IN THE MENINGEAL STAGE OF POLIOMYELITIS

SIR,—Dr. Ryle's interesting article of June 19 (p. 945) demonstrates the wide tendency to accept Russell's view[2] that early immobilisation of cases of poliomyelitis decreases the severity of paralysis. Perhaps it would not be out of place to comment on the premises for this conclusion.

Russell, who questioned 44 convalescents, found he could distinguish a meningeal preparalytic phase in 41. Of the 20 cases who had had abortive or mild attacks 10 had been treated in bed from the first appearance of meningeal symptoms, and of the 21 who developed paralysis only 1 had taken to bed during this stage. Russell's conclusion that these figures are significant would, however, be invalidated if an error occurred in sampling. It is here suggested that since Russell's observations were confined to convalescents, and since his cases were collected from four different cities, he only saw that small proportion of abortive cases which happened to be recognised in the meningeal stage. This method of sampling was likely to reveal a much higher proportion of paralytic cases. If so, the history obtained from the latter gave a more average picture of the behaviour of patients in the meningeal phase.

Paul and his co-workers,[3] Casey and his colleagues,[4] and Ryle have discovered abortive cases only by careful observation of contacts; and these and other writers agree that the abortive cases greatly outnumber the paralytics. Casey even suggests that the ratio is 98 abortive cases to 2 paralytics.

During last year's epidemic 7 paralytic cases, 1 fatal case, and 10 abortive cases, were treated at Catterick Camp and later described by me.[5] Of the paralytic cases, 6 were treated in bed from the start of the meningeal stage, but after thirty-six hours to four days developed paralysis. Similar early treatment was *instituted in the abortive cases.* These men regarded their meningeal symptoms lightly, and I concluded that in civilian life most of the paralytics would have been admitted to hospital only after onset of paralysis, and that most of the abortive cases would not have come into

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1. Parry, T. G. W. *Brit. med. J.* 1939, ii, 396.
2. Moody, R. L. *Lancet*, 1947, i, 964.
3. Inman, W. S. *Med. Pr.* 1939, 202, 121.

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1. *Lancet*, 1948, i, 613.
2. Russell, W. R. *Brit. med. J.* 1947, ii, 1023.
3. Paul, J. R., Salinger, R., Trask, J. D. *J. Amer. med. Ass.* 1932, 98, 2262.
4. Casey, A. E., Fishbein, W. I., Abrams, I., Bundesen, H. N. *Amer. J. Dis. Child.* 1946, 72, 661.
5. Dixon, G. J. *Brit. med. J.* 1948, i, 1175.

Parliament

Children Bill

In moving the third reading of the Children Bill in the House of Commons on June 28 Mr. **Chuter Ede**, the Home Secretary, said it was some tribute to the work that could still be done by enlightened people using the more respectable parts of the press for the ventilation of public grievances that this great measure had virtually grown from a letter written to the *Times* by Lady Allen of Hurtwood. The Bill placed new and heavy duties on local authorities and brought into being the important post of children's officer. Mr. **Kenneth Lindsay** regarded the measure as transitional pending a more enlightened conception. Commander **Galbraith** urged that in the appointment of children's officers too much stress should not be laid on academic qualifications. Mr. **Younger**, replying to the debate, paid a tribute to the voluntary organisations which, he said, were responsible for a large number of children and to which a great deal of initiative would still be left.

Medical Service in Factories

In the adjourned debate on the second reading of the Factories Bill on July 2 Dr. H. B. **Morgan** expressed deep concern in regard to this measure. He regarded it as retrograde. The complement to the National Health Service Act would have been an Industrial Medical Services Act for which there was a great desire among the organised workers of the country. The part of the Bill to which the trade-union movement took most exception was the new provisions in regard to the examining surgeons whose duties were defined in the main Act of 1937. Not only was there to be a change of name, but a doctor selected by employers, individually or in combination, or the industrial medical officer appointed by the employer in a particular factory, would have the option of being appointed as a factory doctor and be able to fulfil all the duties formerly imposed on the examining surgeon, who was supposed to be an impartial person appointed by the appropriate Government department. Dr. Morgan suggested that the Minister should make this provision particular instead of general, and take authority to say that the company's doctor should not usually be appointed to the post. The decision on recruitment into industry, instead of being decisive, should be subject to appeal. The Bill, as a whole, was not the way in which the Government should handle an industrial medical service. Only the large factories had industrial medical officers under the regulations made by the former Minister of Health. What was being done about the small factories in which there might be as many health hazards as in the large ones?

After further debate Mr. G. **Isaacs**, Minister of Labour, said he had a great deal of sympathy with Dr. Morgan's point. He knew that if the firm's doctor was the one who was to certify whether a man had contracted a particular disease in that firm or not, the worker might have a doubt in his mind, although he (Mr. Isaacs) did not believe that a doctor would be swayed from his professional ideals. He had given an undertaking to examine with the most meticulous care any amendments designed to remove doubts and misunderstandings on this score. If he thought the Bill would retard the introduction of a full industrial medical service he would hesitate about giving it his support.

The Bill was read a second time.

Supply of Artificial Limbs

In the House of Commons on July 1 Mr. **George Buchanan**, Minister of Pensions, said that arrangements had been made which would enable every firm which was able to produce an artificial limb of high quality to continue in production. These arrangements were:

(1) Every patient requiring a limb will be asked to attend at one of the Ministry's limb-fitting centres reasonably close to his home. He will there be examined by a Ministry of Pensions experienced and highly qualified limb-fitting surgeon who, in consultation with the surgeon who performed the amputation, will prescribe the type of limb required for his particular stump.

(2) The patient will then be given all necessary information to enable him to make his choice of limb from lists of makers whose limbs have been approved by the Ministry of Pensions and who have entered into a contract for this purpose.

(3) If he chooses a limb such as is now being supplied to war-disabled pensioners he will get this as a free issue. If he chooses an approved limb of some other make and this costs more, he will be charged the excess.

(4) If he chooses the free limb, he will be dealt with throughout at the Ministry's limb-fitting centre. If, however, he chooses another approved limb he will be put into touch with the maker who will arrange for measurements to be taken and fittings to be given. He will be required to attend at the Ministry's limb-fitting centre when he has been satisfactorily fitted in this manner where he will be examined by the limb-fitting surgeon, who will ensure that the limb is satisfactory in all respects.

The object was to allow the patient a reasonable choice in regard to the type of limb and maker, while putting at his disposal all the specialised medical skill acquired by the Ministry's limb-fitting service.

In answer to Dr. **Haden Guest**, the Minister said that his department spent a considerable amount of money and time on research. "It is our purpose not only to make the results of this research available to the main Government contractors, but also to every maker of artificial limbs." He told Sir **Henry Morris-Jones** that he regarded the scheme as a fair compromise and trusted that it would be given a chance to work. After a reasonable time it could be reviewed.

QUESTION TIME

N.H.S. List of Doctors

Mr. A. C. **Bossom** asked the Minister of Health whether he would state when the list of doctors in the Health Service, promised for June 21 or soon after, would be available in post-offices and libraries, so that the public might choose their doctors.—Mr. **Bevan** replied: I asked executive councils to get these lists into the post-offices on or as soon as possible after June 21. Some of them have already done so: others, including London, have not yet succeeded, but will do so as soon as possible. Any member of the public in an area where the lists have not yet appeared can apply to the executive council for the names of doctors on the list in his neighbourhood.

Answering a further question he added: I always expected that, in consequence of the tardiness of many of the doctors to sign up on these lists, there would be inconvenience after July 5. The House will recollect that the official propaganda of the profession itself told the doctors that there was no hurry to sign up, and the result is that we have had a large rush of doctors in the last few days, making it quite impossible for executive councils to put up complete lists in time. Furthermore, many of the local medical committees of the profession have asked the executive councils not to put up incomplete lists, because they said it would be unfair to those doctors who had not yet signed up, so that, in some instances, and in fact in many cases, it is entirely in consequence of the conduct of the official propaganda by the medical profession, for which I refuse to accept the slightest responsibility. The House will recollect that I myself issued leaflets urging the profession and the public to sign up.

Mr. **Ralph Assheton**: I am sorry that the Minister has seen fit to put the blame entirely on the doctors, which we on the Opposition side of the House certainly cannot accept. Can the Minister indicate where communications may be addressed to these executive councils?

Mr. **Bevan**: The names and addresses of the executive councils are put up in the post-offices and in some cases in the public libraries. Part of the difficulty in London is that some 1500 general practitioners have to be classified for their particular areas. Obviously, putting up 1500 names in one list is of no use to anybody at all.

Major **Tufton Beamish**: Is it not absolutely unfair to put the whole blame for the delay on the doctors, than whom there is no more public-spirited body in the country? Is

Radiographic examination of chest showed large mediastinal glands, but there was no evidence of metastases in the long bones or skull. On the 4th day after admission he was still conscious, but had severe head retraction; the cervical glands had enlarged further, and the spleen was now down to the umbilicus and the liver 3 finger-breadths below the costal margin. His condition deteriorated rapidly and he died 11 days after admission—i.e., 15 days after the onset of the first symptoms. Permission for a necropsy was not obtained.

The pronounced signs of meningitis could hardly be explained by inflammation of the comparatively small cervical glands causing local irritation and spasm, and it must be presumed that there was infiltration of the meninges.

I wish to thank Dr. Wilfrid Sheldon for permission to publish this case.

London, N.W.3. BERNARD M. LAURANCE.

INCOMES FOR SPECIALISTS AND GOVERNMENT MEDICAL OFFICERS

SIR,—The Institution of Professional Civil Servants, as the Civil Service body representing medical officers in the Civil Service (other than those employed in the Ministry of Health and the Board of Education), was very interested in the letter in your issue of June 19, signed by "A Stepchild of the Profession." It is time that attention was drawn to the inadequate salaries paid to medical officers in the Civil Service. The service requires doctors with high qualifications and wide experience, but owing to the low salaries and poor prospects which are offered it is finding great difficulty in recruiting candidates of suitable calibre, and in retaining those it has been able to recruit. Indeed, those who have been in the service for many years are now seeking employment outside the service, even when this means that they will lose the valuable superannuation rights which they have earned to date. The remuneration to be enjoyed by general practitioners and consultants and specialists under the National Health Service is so much higher than that in operation in the service that, unless immediate action is taken, the service must resign itself to losing the best qualified of its doctors and to recruiting substandard candidates who will be unable properly to carry out the highly responsible duties now assigned to medical officers in the Civil Service.

This institution has already written to the Treasury pointing out that the difficulties which it has experienced in recruitment will now be still further increased, and asking it to consider a revision of the salary scales of medical officers in the light of the Spens reports.

R. MILLER
Acting General Secretary,
Institution of Professional Civil Servants.
17, Hans Place, London, S.W.1.

EPILEPSY

SIR,—I read with great interest the article on epilepsy in the "Disabilities" series. As the writer points out there is a need to educate the public and those in charge of industry about epilepsy. In this respect we are several steps behind the United States, but moves are being made which I think should be made known—even to the medical profession, who are familiar with the disability but not necessarily with its social and industrial problems.

The Ministry of Labour has circulated a leaflet on epilepsy (form DPL5) to selected employers all over the country, and the Disablement Resettlement Officers have followed this up by personal visits. The leaflets are also available at local employment exchanges. But this, of course, touches only the fringe of the employment problem and much more needs to be done. A group of people in Birmingham have asked the Ministry of Labour to set up special workshops for epileptics unfit for industry but not seriously enough handicapped to go into a colony or to remain at home doing outwork. Alternatively we want places definitely allotted in the Remploy factories. In order that epileptics can be recommended to employers with more confidence special stabilisation centres or clinics are required, to work in close contact with industry. Two such have already been set up, at St. John's Hospital, Battersea, and at All Saints' Psychiatric Clinic, Birmingham. The National Hospital, London, is making a social survey, and there is an interesting "half-way house" experiment in being at St. David's, Edmonton.

Some of us feel that to make any real progress we need two things soon: a national association and a Government working party.

Birmingham. H. HALSTEAD.

SIR,—I should like to thank the author of that remarkable account of epilepsy from the patient's point of view, which appeared in your issue of June 26. One does not get to know these things in the ordinary way.

Granted that the fit is a very individual matter, it is good to know that some patients do not find their attacks unpleasant, and may even have a feeling of extraordinary wellbeing on coming round. That the aura can be worse than the attack, and in particular that this sensation may persist after attacks as such have been controlled, shows that we must not rest until these patients have obtained complete relief. Lennox[1] mentions an almost identical case, in which the persisting aura was quelled by means of 'Mesantoin' (methylphenylethylhydantoin).

London, W.1. H. PULLAR-STRECKER.

NEURALGIC AMYOTROPHY

SIR,—The syndrome described by Dr. Parsonage and Dr. Aldren Turner (June 26) appears to consist in essence of an asymmetrical, patchy, atrophic paralysis of the muscles of the upper limb with a predilection for the shoulder-girdles, combined in some cases, with mild cutaneous sensory loss. The picture is highly suggestive of a mononeuritis multiplex. Kernohan and Woltman[2] found this type of neuritis in 20% of their cases of polyarteritis nodosa and were able to demonstrate that the changes were brought about by nerve ischæmia following an obliterative arteritis of the vasa nervorum. The authors agree that their syndrome is probably identical with neuritis following serum injections, and this lends support to the suggestion that an allergic necrotising arteritis of the type found by Kernohan and Woltman is the pathological basis of their clinical findings.

Grays, Essex. R. N. HERSON.

THE PAIN CHART

SIR,—Readers have no doubt liked Dr. Keele's unassuming but important article last week. His investigation has led him to suggest that irregularity in the time-intensity curve shows psychogeny, total or as a considerable contributory factor. I think we can understand why a certain regularity of the chart characterises organic pain, since it must be dependent on the reaction of the diseased part to the routine influences in daily life, as well as to the course of metabolic processes.

May I point out that genuine psychogenic pain occurs sometimes at regular intervals and hours? This may be the case when pain is the presenting symptom of a severe psychoneurosis, and not merely a component of an organic pathological process or the product of the patient's reaction to such an illness. The pure psychogenic pain occurring at certain hours (sometimes on particular days of the week or month) points to a trauma that took place at a certain time. If this event occurred during the night, the patient may be awakened by his pain at a certain stereotyped hour. Apart from such rare cases, the purely psychogenic pain, however troublesome otherwise, does not disturb sleep, unless accompanying an incidental dream of a specific content. Psychogenic pains of a serious nature do not respond satisfactorily to analgetic drugs—a characteristic they share with organic central pain—and even less to placebos, even though they may do so once or twice.

London, W.1. S. LOWY.

BIOGRAPHY OF SIR BERNARD SPILSBURY

SIR,—I am collecting material for a biography of my father, the late Sir Bernard Spilsbury, and would be most grateful to anyone who can supply details of his life and cases which would assist the biographer. Documents or photographs will be copied and returned immediately.

8, Eton Hall, Eton College Road,
London, N.W.3. EVELYN STEEL.

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1. Lennox, W. G. *Amer. J. Psychiat.* 1946, 103, 159.
2. Kernohan, J. W., Woltman, H. W. *Arch. Neurol. Psychiat.* 1938, 39, 655.

s of aftercare which will be invaluable when the patient as home or to work. A Cardiff hospital seems to be a useful lead: on one day a month visitors of any can hope to meet and talk to the surgeon, doctor, and in charge of the case which interests them. In Cardiff, health visitors following up diabetic and peptic ulcer have attended ward rounds to bring their knowledge e management of these cases up to date.

ss B. A. Read, head almoner of St. Thomas's, showed the almoner can act as go-between for ward sister and c health nurse. Where she is in close daily touch with sisters she can often save the health visitor a personal at the hospital to discuss a minor point. Miss Read it smooths the transition of a patient from the wards he outpatient department when the almoner passes on he outpatient sister information derived from the ward r; but this seems a roundabout system. Why can't two sisters discuss the case over lunch, like the rest of. In practice, no doubt, they often do.

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versity of Oxford

r. G. P. Gladstone has been appointed reader in bacterio-

lversity of London

wo chairs have been established in the department of hology at King's College Hospital medical school; a ir of morbid anatomy to which Dr. H. A. Magnus has been ointed, and a chair of chemical pathology to which Dr. H. Gray has been appointed.

r. Magnus qualified from Bart's in 1932, taking his M.B. Lond. he following year, and in 1937 he was awarded the gold medal pathology for his M.D. thesis. After holding a house-appointnt at Bart's he became senior lecturer in morbid anatomy there ore taking up his present appointment as morbid anatomist at g's College Hospital. During the war he served in the R.A.M.C. h the rank of lieut.-colonel. His published work includes papers the pathology of gastritis and the experimental production of illomata in the lungs.

r. Gray graduated B.SC. Lond. with honours in chemistry in 2 before taking up medicine. He qualified from University lege Hospital in 1936, taking his M.B. the following year. In 8 he obtained his M.SC. in biochemistry. He held the Graham olarship in pathology and the Bayliss-Starling scholarship in siology and biochemistry at University College, where he also ed as demonstrator in biochemistry. Later he became lecturer biochemistry at King's College Hospital medical school and biomist to the hospital. He is also honorary lecturer in biochemistry University College. He is a fellow of the Royal Institute of emistry. He has published papers on ketonæmia and on serum atment in nephrosis.

University of Leeds

At recent examinations for the D.P.H. the following were successful: G. Higgins, G. W. Knight, J. Lyons.

University of St. Andrews

At recent examinations the following were successful:

M.D.—A. D. H. MacPherson (with honours); W. L. M. Perry (with commendation); W. M. Shearer.

M.B., Ch.B.—W. K. Stewart (with distinction); I. T. Carrie, J. A. Clark, Marjorie Crumpton, J. C. Davidson, G. F. E. Edmondson-Jones, Hamish Fraser, W. A. Hogg, G. S. Nelson, J. H. Renwick, W. F. Walker (with commendation); C. K. Anderson, J. A. Black, R. J. P. Blyth, D. M. Brough, K. A. Buchanan, A. L. Cairns, T. G. Cameron, Jessie D. Carrick, Alison Chapman, D. H. Cook, I. W. Davidson, D. R. Edwards, Jack Eyton-Jones, Sheila R. Fisher, Elizabeth M. Ford, Alexander Gerrard, Mildred F. Gordon, J. G. Grounds, Margaret B. W. Gyle, Phyllis H. Jewitt, R. P. W. Kup, Tamsin M. R. Lee, Norman Levinson, Margaret S. Lewis, D. E. Macdonald, R. S. McKelvey, C. A. Moodie, D. S. Munro, D. C. Murdoch, Edith M. Nairn, Megan C. Pratt, Joan A. Robertson, Catherine E. E. Sharp, Mary E. Shelswell, A. L. Stead, P. A. N. Wainwright, F. W. Wigzell, Katharine F. Wilson.

University of Dublin

On June 30 at the school of physic, Trinity College, the following degrees were conferred:

M.D.—D. H. A. Irwin, Bernard Kernoff, Ethna M. MacCarthy, Reuben Resnekov.

M.B., B.Ch., B.A.O.—Elizabeth E. Bird, Doris J. Black, G. W. Brown, N. P. Browne, Maureen A. Byrne, J. A. Campbell, J. E. F. Coolican, C. J. Davis, R. B. Dockrell, R. F. Doyle, C. M. Elliott, J. L. England, R. B. Flood, Sheila S. Hanbidge, J. A. R. Hanna, Hetty Hool, N. B. Hool, D. T. Irwin, Anna E. Johnston, P. A. Johnston, A. L. Jones, H. A. Karrach, Margaret K. B. Knox, I. J. Kritzinger, Edith E. Kyle, D. F. V. Lane, Muriel T. McKenna, T. B. Madden, M. J. P. O'Brien, M. S. O'Grady, Dorothy C. Oswald, N. McN. Parkes, P. K. Storah, Blanche Weekes, A. M. Wiley.

L.M.—H. G. Alton.

At a recent examination the following were successful:

D.G.O.—G. P. Balouny, A. S. Choudhuri, Malak Ghannam, Salem Haydari, A. J. B. Paes.

Queen's University, Belfast

Dr. F. M. B. Allen has been appointed to the newly established Nuffield chair of child health.

Dr. Allen, who is 50 years of age, is now lecturer in infant hygiene and diseases of children in the university, physician to the Belfast Hospital for Sick Children, and physician in charge of infants at the Royal Maternity Hospital. He graduated M.B. with honours at the Queen's University in 1920 and proceeded to the M.D. three years later. After graduation he held house-appointments at the Royal Victoria Hospital, Belfast, and from 1923 to 1924 he was Musgrave research student and later lecturer in materia medica at the university. He has also served as a hospital officer to the minister of home affairs for Northern Ireland, and as a medical member of a pensions appeal tribunal. His *Aids to Diseases of Children* and his *Diseases in Infancy and Childhood* have both gone into several editions. He was elected F.R.C.P. in 1939.

Royal College of Surgeons of England

Election to the Council.—On July 1 Sir Harry Platt was re-elected and Mr. R. C. Brock and Sir Archibald McIndoe were elected members of the council. The result of the poll was as follows:

	Votes
Sir HARRY PLATT (Royal Infirmary, Manchester) ..	672
Sir ARCHIBALD MCINDOE (St. Bartholomew's)	454
R. C. BROCK (Guy's)	418
A. DICKSON WRIGHT (St. Mary's)	416
R. H. MAINGOT (Royal Free)	353
E. W. RICHES (Middlesex)	331
A. HEDLEY WHYTE (Royal Victoria, Newcastle-on-Tyne)	266
A. C. PERRY (London)	239
H. W. RODGERS (Royal Victoria, Belfast)	217
H. J. MCCURRICH (Royal Sussex County)	206
R. H. O. B. ROBINSON (St. Thomas's)	205
H. W. SYMONS (General Infirmary, Leeds)	178
M. F. NICHOLLS (St. George's)	149
A. C. PALMER (King's College)	132

In all 1588 fellows voted; in addition 22 votes were found to be invalid.

Royal Medical Benevolent Fund

Last year this fund received a record subscription income, amounting to £20,791, and, in addition, special donations totalling £1330. The proceeds of the Christmas appeal also constituted a record, and £5 was distributed as a Christmas gift to each of the fund's regular beneficiaries. With 343 additions to the list, the number of covenants is now over 1150; and last year 143 newly qualified doctors became subscribers. These figures were given by the hon. treasurer at the annual general meeting on June 29, when Lord Webb-Johnson was re-elected president, Dr. C. L. Batteson hon. treasurer, and Mr. Victor Riddell hon. secretary.

Addition to Poisons List

'Tridione' (3 : 5 : 5-trimethyl-oxazolidine-2 : 4-dione) has been added to part I of the Poisons List and to the first and fourth schedules to the Poisons Rules.

Fellowships in Diabetes

The Diabetic Association have allotted Lund research fellowships to the following:

1947–48

Dr. J. A. L. GILBERT (full-time) in the department of therapeutics, clinical laboratory, Royal Infirmary, Edinburgh: Problems in Diabetic Pregnancies.

Dr. J. HILDES (part-time) at Hammersmith Postgraduate School: Studies in Liver Glycogen.

Dr. J. A. ROBERTSON (part-time) at King's College Hospital, London: Renal Complications of Diabetes.

1948–49

Miss G. AUDY (part-time) in the department of biochemistry, University College, London: In-vitro Studies of Insulin Action.

Mr. H. H. FOURACRE BARNS, F.R.C.S., and Dr. M. E. MORGANS (part-time) at the medical unit, University College Hospital: Animal Experiments in Diabetic Pregnancies.

Dr. H. HARRIS (full-time) at the Galton laboratory, University College: Diabetic Heredity.

Order of the Hospital of St. John of Jerusalem

Promotions and appointments recently announced include:

Knights.—Brigadier Sir Stewart Duke-Elder, K.C.V.O., F.R.C.S., Christopher Armstrong, M.B.

Commanders.—Lieut.-Colonel W. S. C. Copeman, O.B.E., F.R.C.P., Surgeon Rear-Admiral Sir Henry White, K.C.V.O., O.B.E., F.R.C.S., K.H.S., Surgeon Rear-Admiral C. E. Greeson, C.B., M.D., K.H.P.

Associate Commanders.—Khan Bahadur Abdul Hamid, M.B.E., M.B., Major-General A. N. Sharma, M.B., I.M.S., P. C. Roy, M.B.

Officers.—Cecil Hibbert, M.D., J. D. Ingram, M.D., R. G. Selby, M.B., Frank Law, F.R.C.S., E. K. Macdonald, O.B.E., M.D., Surgeon Captain William Colborne, F.R.C.S., R.N., Surgeon Captain F. G. Hunt, C.B.E., M.B., R.N., Prof. Philip Farrugia, M.D., John Lawrence Johnston, M.B., Harry Scholefield, M.B., J. A. Davies, L.M.S.S.A., J. P. J. Jenkins, O.B.E., M.R.C.S., G. W. H. Townsend, M.B., Travis Hampson, M.C., M.B., Rhys Paton, M.R.C.S., N. G. W. Davidson, O.B.E., F.R.C.S.

Associate Officers.—Lieut.-Colonel Diwan Pitamber Nath, M.B., I.M.S., Captain Khan Bahadur N. J. Vazifdar, M.B.E., L.M.S., Lieut.-Colonel G. D. Malhoutra, O.B.E., M.B., I.M.S., Dr. Chit Tin.

Tuberculosis Scholarships in Denmark

The Danish National Association against Tuberculosis invite British doctors to visit Denmark to study the measures taken there against the disease. A limited number of scholarships are also available. Further particulars may be had from the association, 21, Store Strandstraede, Copenhagen, K., who offer to help their visitors in making travelling arrangements.

The barony conferred on Sir Alfred Webb-Johnson in the Birthday honours has been gazetted by the name, style, and title of Baron Webb-Johnson, of Stoke-on-Trent in the county of Stafford.

Appointments

DOUGLAS, D. M., M.B. Lond., M.R.C.P.: asst. physician, Royal Edinburgh Hospital for Sick Children.

DRANSFIELD, C. M., F.R.C.S.: orthopædic surgeon, Ashton and District Infirmary and Children's Hospital.

FINLAY, H. V. L., M.B. Edin., M.R.C.P.E., D.C.H.: pædiatrician, Hillingdon County Hospital, Middlesex.

NICHOLSON, W. F., M.B.E., M.A., M.D., M.CHIR. Camb., F.R.C.S.: asst. surgeon, Manchester Royal Infirmary.

SCOTT, P. D., M.A., M.D. Camb., D.P.M.: psychiatrist (part-time) in public-health department for duty at L.C.C. remand homes.

ZOOB, MAX, M.D. Lond., M.R.C.P.: first assistant, cardiological department, Royal Free Hospital, London.

University College Hospital, W.C.1:

NICHOLSON, HOWARD, M.D. Lond., M.R.C.P.: asst. physician.

SODDY, KENNETH, M.D. Lond., D.P.M.: asst. physician, department of psychological medicine.

TREDGOLD, R. F., M.A., M.D. Camb., D.P.M.: asst. physician, department of psychological medicine.

Hampstead General and North-West London Hospital:

MARTIN, A. J., O.B.E., M.R.C.S., D.PHYS.MED.: physician i.c. physiotherapy department.

WILLIAMS, A. E., B.SC., M.B. Wales, F.R.C.S.: surgeon to out-patients.

Children's Hospital, Birmingham:

ASTLEY, ROY, M.B. Birm., D.M.R.: asst. radiologist.

CRABTREE, N. L., F.R.C.S., D.L.O.: asst. aural surgeon and laryngologist.

General Hospital, Northampton:

Asst. consultant surgeons:

LAMBLEY, D. G., B.SC., M.B. Lond., F.R.C.S.

TAYLOR, E. E. T., M.A., B.M., M.CH. Oxfd, F.R.C.S.

Diary of the Week

JULY 11 TO 17

Monday, 12th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. Norman Capener: Orthopædic Appliances.

6.15 P.M. Dr. H. G. Epstein: Some Aspects of Physics in An thesia.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1

8.30 P.M. Dr. Arthur Proctr, Prof. R. J. V. Pulvertaft: Nat Defences and Disorders of the Respiratory Tract.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

3.30 P.M. (Anatomy lecture theatre, University of Edinburgh) Prof. A. C. Frazer: Fat Digestion and Absorption.

Tuesday, 13th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1

5 P.M. Dr. J. W. Trevan, F.R.S.: Curare and Curarimim Drugs. (Bertram Louis Abrahams lecture.)

ROYAL COLLEGE OF SURGEONS

5 P.M. Mr. Ronald Furlong: Injuries of the Wrist and Carpus.

6.15 P.M. Dr. Ronald Jarman: Chemistry of Common An thetics.

Wednesday, 14th

ROYAL COLLEGE OF SURGEONS

5 P.M. Mr. A. N. Birkett: Fractures of the Cervical Spine.

6.15 P.M. Dr. B. L. S. Murtagh: Avoidable Accidents in An thesia.

Thursday, 15th

ROYAL COLLEGE OF SURGEONS

5 P.M. Prof. T. P. MCMURRAY: Derangements of the Knee-joint

6.15 P.M. Dr. Ronald Woolmer: Diagnostic and Therapeuti Uses of Anæsthetics.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

4.30 P.M. Sir Jack Drummond, F.R.S.: Practical Significance of War-time Experience in the Field of Nutrition.

Friday, 16th

ROYAL COLLEGE OF SURGEONS

5 P.M. Prof. Andrew Jackson (Philadelphia): Growth and Development from the Clinical Aspect of Orthodontics. (Charles Tomes lecture.)

ASSOCIATION OF CLINICAL PATHOLOGISTS

9.30 A.M. (University, Sheffield, 10.) Opening of two-day scientific meeting.

Saturday, 17th

NUTRITION SOCIETY

10.30 A.M. (1, Wimpole Street, W.1.) Conference on the Nutriti of Athletes.

Births, Marriages, and Deaths

BIRTHS

ATKINSON.—On June 29, at Redhill, the wife of Dr. Henry Atkin —a daughter.

BALL.—On June 28, at Vellore, India, the wife of Dr. J. Ball—a son.

BALL.—On July 4, in London, the wife of Dr. Keith Ball—a son.

BEATTIE.—On June 20, in Liverpool, the wife of Mr. W. M. Beat F.R.C.S.—a son.

BISHOP.—On June 28, at Bristol, the wife of Dr. Geoffrey Bish— a daughter.

BROWNE.—On June 26, at Newcastle-on-Tyne, the wife of Pr R. C. Browne—a daughter.

DEVLIN.—On June 27, at Falmouth, the wife of Dr. H. R. T. Devli —a daughter.

FARR.—On June 25, at Mwanza, Tanganyika, the wife of Dr. A. G. Farr—a daughter.

LIGHT.—On June 26, at Burnham-on-Crouch, the wife of Dr L.H.B. Light—a son.

OLIVER.—On June 28, at Norwich, the wife of Dr. W. A. Oliver, M.B.E.—a son.

OSBORNE.—On June 28, at Chalfont St. Giles, Bucks, the wife of Dr. A. S. Osborne—a son.

READ.—On June 30, the wife of Dr. A. M. Read—a daughter

TRETHOWAN.—On July 3, in London, the wife of Dr. W. H. Tretho —a son.

WALKER.—On June 24, at Barnsley, the wife of Dr. M. M. Wal —a son.

MARRIAGES

DICKSON—DAWSON.—On June 26, at Grendon Underwood, H Harper Dickson, M.B., to Elisabeth Dawson.

GIBBONS—DAVIES.—On June 10, at New Tredegar, Mon., Ch Cecil Gibbons, L.M.S.S.A., to Marion Cale Davies.

KUNKLER—HAILEY.—On June 26, Peter Bertrand Kun M.R.C.P., to Pamela Hailey.

MACRAE—CREED.—On July 3, in London, Alastair Douglas Ma M.B., to Ena D. Creed.

MAIR—ORDE.—On June 26, at Blewbury, Robert George M M.B., to Nancy Elizabeth Cecilia Orde.

DEATHS

CONNOP.—On June 30, at Hatch Beauchamp, Somerset, Har Connop, M.A. Camb., L.R.C.P.E., major, R.A.M.C. (T.) retd

COOKE.—On June 28, Martin Alfred Cooke, O.B.E., T.D., M.R.C.

FLEMING.—On June 27, in Edinburgh, Archibald Nicol Flem D.S.O., colonel, I.M.S. retd., aged 78.

HEGGS.—On July 1, in Jersey, Thomas Barrett Heggs, M.D. Ab D.P.H., aged 68.

SMITH.—On June 28, in Jersey, Frank Addinsell Smith, M.D. L D.P.H., lieut.-colonel, I.M.S. retd., aged 78.

MOVEMENT OF THE DIAPHRAGM AFTER OPERATION*

JOHN HOWKINS

M.D., M.S. Lond., F.R.C.S.

ASSISTANT OBSTETRIC AND GYNÆCOLOGICAL SURGEON,
ST. BARTHOLOMEW'S HOSPITAL, LONDON

DURING the late war many Servicemen presented hemselves for elective operation the indication for which was the only lesion in an otherwise fit man. Their espiratory systems, apart from the indiscreet use of obacco, were as good as the average for their age-roup of 20–40 years. Despite this good physique, nd every effort to minimise the use of tobacco, chest omplications after clean hernia operations were umerous, and it was in an effort to discover the cause f this high complication-rate that the present work was undertaken. All Service surgeons were worried by this problem. The primary concern was to investigate chest omplications after operation for hernia, and this xplains the preponderance in this series of these cases which are such notorious offenders. A number of other operations and some extra-abdominal operations were ncluded to act as controls.

The types of operation or the conditions for which hey were performed were as follows:

MacArthur's unilateral herniorrhaphy ..	134
Bilateral herniorrhaphy	1
Femoral herniotomy	3
Appendicectomy—cold and recurrent cases ..	18
Piles, anal fissure, and other anal conditions..	19
Hydrocele	6
Varicose veins	3
Cystoscopy	3
Pilonidal sinus excision..	2
Minor surgery of the hand	2
Circumcision	2
Excision of lipoma	2
Thyroidectomy (non-toxic adenoma) ..	1
Excision of tuberculous glands in neck ..	1
Mastectomy	1
Exploration of gunshot wound of neck ..	1
Brodie's abscess of femur	1
Total	200

he material was standardised as far as possible, and y case was premedicated in the same way, with nopon ’ gr. 1/3 and scopolamine gr. 1/150. No post-ative respiratory depressants were used, except in operations on the anal canal and 1 thyroidectomy. toperative discomfort was treated with simple drugs, as aspirin and bromide, and it is here opportune raw attention to the unnecessary and excessive use pium and its derivatives as a postoperative routine. use is seldom indicated, and its selective action on the iratory centre undoubtedly depresses diaphragmatic ursion. The anæsthetic agents used were, of necessity, ous, but spinal anæsthesia preponderated, because as intended to show that the use of a non-inhalation sthetic is no insurance against postoperative pul-ary complications. Though this fact is well recognised anæsthetists, some surgeons still do not realise that al or local anæsthesia is as great an offender as er, as shown by the following figures:

Anæsthetic	*No. of cases*	*No. with diminished diaphragm movement*
Heavy spinal	113 ..	100
Light spinal	14 ..	11
Pentobarbitone gas-oxygen	41 ..	25
Pentobarbitone gas-oxygen plus ether	19 ..	11
Local (with P.G.O. or without).. ..	13 ..	11
Totals	200	158

Technique.—Twenty-four hours before operation the patient was taken in a wheeled chair to the X-ray department, and it was carefully explained to him what he was expected to do. His coöperation was secured by encouragement and a frank explanation of the investigation. His vital capacity and chest expansion were measured after several practice runs. This expenditure of trouble was considered to be important since low morale and non-coöperation easily vitiate the result of such an experiment.

The chest expansion was measured with a tape placed at the level of the lower border of the sternum, and represented the maximal expansion of which the patient was capable. Vital capacity was measured with a portable spirometer, and here again the patient was encouraged to produce the maximal effort. The movements of the diaphragm were measured by placing the patient behind a fluorescent screen, with the screen touching the anterior chest wall. A small tube aperture was used with the patient in the erect position. On deep inspiration the position of the mid-point of the dome of the diaphragm was marked on the screen, a similar mark being made on full expiration. The mean of several observations was taken.

The erect position was used here, but for future work the supine position is recommended for observing the diaphragm after operation. It is more comfortable for the patient, and in this position the diaphragm has a slightly greater excursion, which is therefore more easily measured. It is not generally realised that a patient can be screened efficiently through most mattresses.

RESULTS

Diminished Movement of Diaphragm

In the 200 cases observed the lower limit of normal excursion was 1·5 cm. and the upper 10 cm. This latter figure was exceptional and only occurred in good physical specimens such as air-crew personnel and athletes. The average excursion was 5 cm. In 158 cases there was a diminution of 1 cm. or more:

Site of operation	*No. of cases*	*No. with diminished movement of diaphragm*
Abdominal parietes	162 ..	149
Extra-abdominal operations	38 ..	9
Totals	200	158

Of these, 31 had postoperative chest complications. and of 42 showing no diminution of movement 2 had chest complications. In 83 cases there was a diminution of 2 cm. or more, 24 of them exhibiting chest complications. In 36 there was a diminution of 3 cm., 16 having chest complications.

Diminished diaphragm movement	*No. of cases*	*No. of cases with chest complications*
No diminution	42 ..	2 (5%)
1 cm. or more	158 ..	31 (20%)
2 cm. or more	83 ..	24 (29%)
3 cm. or more	36 ..	16 (44%)

There is therefore some connexion between the incidence of diminished diaphragmatic movement and the chest-complication rate, and this connexion is explicable in two ways: (1) the diminution of diaphragmatic movement encourages atelectasis, which may or may not lead to an infective process and pneumonitis; or (2) the atelectasis precedes the diaphragmatic changes, and is the cause and not the effect of them. It is impossible to say which comes first, but one observation in this series permits a tentative suggestion—namely, that the radiological evidence appears before the clinical signs; and that, in some cases showing diminution of diaphragmatic excursion, chest complications were expected and did arise before there was actual clinical evidence of any lesion in the lungs. This agrees with Stringer's (1947) conclusion. He investigated the incidence of atelectasis in 55 cases after partial gastrectomy. The first signs appeared radiologically at four hours in 5 cases, and at twenty-four hours in a further 6. He concluded that clinical signs were absent, slight, or misleading,

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nterian lecture delivered to the Royal College of Surgeons of England on Jan. 30, 1947.

Figs. 1-5—Superimposed picture of the diaphragm in inspiration and expiration: (1) erect; (2) supine; (3) prone; (4) sitting; and (5) lying on right side. The level on expiration has been emphasised with dotted lines.

Figs. 6 and 7—Unabsorbed gas under diaphragm after abdominal section: (6) on eighth postoperative day; (7) on seventeenth postoperative day.

and that radiography alone could establish an early diagnosis of atelectasis.

The relationship of the site of the operation to the side of the diaphragm in which movement was diminished was investigated in 149 cases, which showed a diminution of diaphragmatic movement after abdominal operation. It was found that the diaphragm was affected on both sides in 92 cases, on the same side as the operation in 42 cases, and on the opposite side in 15 cases. Thus the diminution of movement was not confined to the side of the operation wound. This disagrees with the findings in a small series of cases published by Rees-Jones (1941) and is an argument against a purely local reflex.

Reduction of Vital Capacity

Vital capacity was reduced to some extent after most of the operations, though in 15 cases it was actually increased. This was probably a false reading, owing to a better performance being obtained as the result of practice. The percentage reduction was least in the extra-abdominal cases and more notable in the herniæ. Many patients said they could not obtain a full respiratory excursion because of pain in their abdominal wound. The reduction varied from 5 to 50% or even more in a few cases. Big reductions in vital capacity were noted in cases developing postoperative lung complications, of which there was both clinical and radiological evidence. Not all cases, however, showing diminished vital capacity had a concomitant diminution of excursion, and vice versa. This observation, which seems at first sight a paradox, is explicable as follows: if the diaphragm is not adequately performing its allotted function, there is a compensatory overaction by the thoracic muscles of respiration, and vice versa. These observations agree with those of previous observers. Chest expansion, which is at best a crude method of estimating vital capacity, showed a parallel reduction with reduced vital capacity.

The clinical application of these findings is that breathing exercises which move the thorax do not necessarily move the diaphragm, though if combined with abdominal exercises they are more likely to achieve this aim. Breathing is a complex mechanism involving thorax, abdomen, and diaphragm.

Postoperative Chest Complications

In this series were 33 cases of postoperative chest complication. The definition of this term is subject to criticism, but any patient who exhibited fever, cough, and sputum was considered to have developed a postoperative chest complication. Since these patients were being screened as a routine, there was ample opportunity to pick out any radiological evidence of pulmonary pathology, and 11 cases showed changes not present preoperatively. These were observed by serial screening and radiograms until complete resolution. The change most often observed was partial or complete atelectasis of the lower zones; apical changes were never observed in this series. In 4 of these cases pneumonic consolidation developed. Many cases which showed the signs of postoperative chest complications had persistently clear lung fields. This atelectasis-rate of 5·5% agrees with the findings of other workers (Dripps and Deming, 1946). The low pneumonia-rate is explicable by the age-group of the patients.

MOVEMENT OF THE DIAPHRAGM

Anatomically the diaphragm is a complex structure with a mixed embryological pedigree. It is developed from a fourfold origin, the ventral part from the septum transversum, the dorsal from the mesentery, and the dorsolateral from the pleuroperitoneal membranes, and a peripheral part from the mesoderm of the body wall. This last part retains its nerve supply from the lower six thoracic nerves which it shares with the muscles forming the abdominal parietes. The main motor nerve of the 'aphragm is the phrenic, and it is questionable if the ower thoracic nerves have any share in the motor nnervation of the diaphragm. Their presence, however, ust be of some anatomical significance and certainly plains the close interrelationship of the diaphragm id the abdominal muscles. This close coordination etween the diaphragm and the intercostal and abdominal all muscles almost certainly depends on the central echanism, the respiratory centres of the brain stem nd the descending fibres of the spinal cord. In dogs nilateral section of the phrenic nerve leads to complete nd ultimate atrophy of all muscle-fibres on that side Schlaepfer 1926). The peripheral costal part of the iaphragm arises from the inner surfaces of the costal artilages and adjacent portions of the lower six ribs, nterdigitating with the transversus abdominis muscle n an intimate relationship. The sensory and motor erve supply of the abdominal parietes is derived from he lower thoracic nerves, and action of these muscles in reathing is complementary to the diaphragm, in that they ix and depress the lower ribs and compress the abdominal iscera against the under surface of the diaphragm.

In man the abdominal viscera exert a negative pressure on the under surface of the diaphragm in the erect osition, and this pressure is to some extent countercted by the postural tone of the diaphragm and the onic contraction of the abdominal wall muscles and the pelvic diaphragm. This is well illustrated by the lower position which the diaphragm occupies after a long lebilitating illness, when the tone in these muscles is educed.

The practical application of these facts is that the nspiratory and expiratory levels of the diaphragm vary with varying combinations of the factors influencing the position of the diaphragm. When the body is erect, there is a maximal negative pressure and the diaphragm is low; when it is supine, there is a release of negative pressure and the diaphragm rises (Barclay 1930, Adams and Pillsbury 1922).

ARIATIONS OF DIAPHRAGM POSITION WITH CHANGE OF POSTURE

Position	Movement of diaphragm	Level of upper border of diaphragm	Distance from marker at D 9 (cm.)	
			Right	Left
Erect (fig. 1)	Inspiration	L 1	12·50	13·00
	Expiration	D 12	8·75	10·00
	Excursion		3·75	3·00
Supine (fig. 2)	Inspiration	D 12	9·50	10·50
	Expiration	D 11	5·00	6·25
	Excursion		4·50	4·25
Prone (fig. 3)	Inspiration	D 12	10·50	12·25
	Expiration	D 11	5·50	7·50
	Excursion		5·00	4·75
Sitting (fig. 4)	Inspiration	D 12, L 1	11·25	12·50
	Expiration	D 12	8·75	10·00
	Excursion		2·75	2·50
Lying on ight side (fig. 5)	Inspiration	Lower D 12	11·25	10·00
	Expiration	Upper D 12	5·00	10·00
	Excursion		6·25	nil
Lying on left side	Inspiration	Upper D 12	10·00	11·25
	Expiration	Mid D 11	8·75	6·25
	Excursion		1·25	5·00

An attempt has been made to reproduce radiographically the alteration in position of the diaphragm with change of posture and to measure this. Certain errors are inescapable. Lead skin-markers move with postural changes as the skin is pushed up or pulled down, and even vertebral levels are misleading. When the tube is centred on the level of the diaphragm in the mid-position between expiration and inspiration, the divergence of the X rays is appreciable at full excursion, and this distortion can only be overcome by orthodiagraphic measures. Hence the radiograms shown in figs. 1–5 represent at best a rough and uncorrected picture of the true levels of the diaphragm, a skin-marker and the upper border of the ninth dorsal vertebræ being the base-line. The patient was a Cockney labourer in good physical condition, and measurements (see table) are in centimetres from the tip of the dome of each half of the diaphragm.

This table, which is fairly typical and in agreement with previous work (Butler and Dana 1928, Howard 1924), illustrates the following points:

(1) The right hemidiaphragm lies about 1·25 cm. higher than the left.

(2) The total excursion of both hemidiaphragms is the same.

(3) The diaphragm is highest in the supine and prone positions, and lowest when in the standing or sitting position.

(4) The total excursion is greatest, by 1·25 cm., in the supine and prone positions, when compared with the erect, and least of all, by 2 cm., in the sitting position compared with the supine.

(5) When the patient is lying on one side, the diaphragm pivots about the spine, the upper hemidiaphragm moving but little, the lower moving considerably.

CLINICAL APPLICATIONS

The clinical applications of these observations is clear. Patients after operation can be encouraged by alteration of posture to increase the range of movement of their diaphragm, and to influence the differential expansion of various parts of the lung, whereas the converse of absolute immobility encourages diaphragmatic stasis and its consequent evils. The sitting position is the least advantageous, and therefore Fowler's position is a bad postoperative one.

Since the abdominal musculature and the abdominal contents play so important a part in the movement of the diaphragm, it is obvious that anything which restricts the freedom of movement of the abdomen also affects the diaphragm. Immobilisation of the abdominal muscles owing to pain, trauma, or constricting binders and dressings undoubtedly diminishes movement of the diaphragm and vital capacity. The application of a tight binder to the abdomen of a man who has not undergone any operation can reduce his vital capacity by 30% (Churchill and McNeil 1927, Head 1927).

The presence of free gas in the abdomen, which to some extent occurs in any operation involving incision of the peritoneum, is another factor which embarrasses the diaphragm. Gas under the diaphragm after a laparotomy attains a considerable volume and takes a long time to disappear. Fig. 6 depicts a large collection of gas under the right hemidiaphragm on the eighth postoperative day. Fig. 7 shows that the gas is still present on the seventeenth day, though its volume is diminished by four-fifths. Complete absorption in some cases probably takes a month.

DEVELOPMENT OF PULMONARY COMPLICATIONS

A curious feature of postoperative pulmonary complications is their predilection for the lung bases, and in the past this has been explained by gravitation of unexpectorated bronchial secretion, inhibition of the coughing mechanism, and failure of ciliary action. Viscidity of the bronchial secretion owing to dehydration and overdoses of atropine encourages bronchial retention. If this argument is carried a step further, complete blockage of a bronchus by a viscid plug leads to absorption of the contained air and atelectasis. The stage is now set for a pneumonitis, and it is a mystery why pneumonitis is not more commonly encountered. It behoves us as surgeons to attack this pathological sequence at its inception and not at its conclusion, and the following are a few suggestions:

(1) *Full and adequate pulmonary ventilation* can be achieved by free movement of the patient in bed, or better still by early ambulation, which provides an incidental benefit in counteracting venous stasis and reducing the danger of thrombosis and embolism originating in the deep veins of the calf and leg muscles. Three actors operate against early postoperative ambulation:

(*a*) The patient's subjective fear of pain. This can be overcome by good morale, and the following case is an illustration. A Canadian rear gunner of a Halifax bomber had had a MacArthur herniorrhaphy. He was up in a chair on the first night, went to the hospital cinema on the fifth day, was discharged on the tenth, was given seven days' sick leave, and on the seventeenth day went over Germany in an operational sortie and shot down an enemy night fighter.

(*b*) The fear of the surgeon that his suture lines will not hold. This fear is groundless if proper technique and interrupted sutures are used. For the timid surgeon the use of stainless steel wire is recommended.

(*c*) The diehard traditions of the past and reverence for the magic numbers—i.e., clips out on the fifth or seventh day, tension sutures on the tenth or fourteenth, up on the eighteenth, and out on the twenty-first.

The part played by the abdomen in respiration must not be forgotten. Restriction of this important respiratory muscle must not be tolerated by cumbersome and uncomfortable dressings. The traditional use of the tight many-tailed abdominal binder is a particular menace. This antiquated device achieves little that it is intended to and much that it should not. It decreases the vital capacity by 30%; restricts movement of the diaphragm; travels up to the axilla, pulling on the stitches in its journey, unless anchored by an unhygienic perineal extension; and requires constant adjustment, with the temptation to take a glance at the wound to see if it is all right. Moreover, it and its attendant handmaiden, the generous pad of cotton-wool, make the patient hot and uncomfortable, and cause local sweating about the wound. If a surgeon wants to seal a wound he can do it with collodion, Whitehead's varnish, or 'Mastisol,' all of which stay put. It is time that the binder was abandoned.

(2) *Attention to Postural Drainage of the Lung.*—If the base is the worst drained part and ciliary action is impaired, the proper postoperative position is certainly not sitting up but lying flat or even with the foot of the bed raised. Better still, the patient should lie first on one side and then on the other. Any clinician who has treated a case of bronchiectasis by postural drainage knows this. Figs. 1–5 should convince the most sceptical that such postural movement is salutory to the diaphragm. The adoption of a statuesque attitude should be absolutely banned, and back-rests and donkey pillows studiously avoided. Fowler's position has already been attacked with some vitriol by other writers, and this is both timely and proper. Physiotherapy can play a very useful part, and this was extensively used by the R.A.M.C. in the war. To be of real benefit it must start before the operation, and patients should be taught to breathe correctly, so that they will have had practice in their postoperative exercises when they are called on to perform them. The secret of success in postoperative exercises is little and often, and not a long single session that leaves a patient exhausted for the rest of the day. Such exercises should start as soon as the patient has properly recovered from his anæsthetic, and should be graduated. Another method of moving the diaphragm and expanding the lung is to place the patient in a Both respirator for twenty-four hours after operation. This experiment was performed by Mushin and Faux (1944), who placed twenty-four abdominal operation patients in the respirator for twenty-four hours. Their communication demonstrates the feasibility of the idea, though the figures are too small to prove its therapeutic value as a prophylaxis against respiratory complications.

(3) *The avoidance of respiratory depressant drugs* has already been mentioned.

(4) *Tobacco* has been arraigned as a predisposing factor in postoperative chest complications, and there is no doubt that heavy smokers incur a fivefold greater risk than do total abstainers. Absolute abstention before elective operation, even for a few days, is a small price to ask and, if explained, will usually be accepted.

(5) *The infective element* can be reduced by never performing an elective operation in a patient with an infection of the upper respiratory tract, and by the avoidance of gross infection, by rigid isolation, between patients in a surgical ward. One small point is often overlooked in inhalation anæsthesia—namely, the proper sterilisation of face-pieces, rubber tubing, and breathing-bags between the apparatus and the patient. I doubt if this is often, if ever, properly performed to obtain the standards of full asepsis. Here is an unexplored reservoir of pathogens which deserves the attention of bacteriological and clinical investigators (A. M. Boyd, personal communication).

SUMMARY

Irrespective of anæsthetic used, the diaphragm after operation shows a diminution of movement.

The vital capacity is diminished in a parallel manner.

The diminution of movement of the diaphragm and the diminution of vital capacity vary in different cases, and may reach complete immobility of the diaphragm and a loss of vital capacity up to 60%.

The site of the operation has some relation to the amount of diminution of movement of the diaphragm, which is more notable after operations on the abdominal parietes than after operations elsewhere.

The greater the diminution of movement of the diaphragm the higher the incidence of chest complications.

Suggestions are made for the improvement of excursion of the diaphragm and vital capacity after operation, with special reference to posture and lung drainage.

I wish to thank Dr. P. M. F. Fraser, Dr. T. M. Prossor, Squadron-Leader H. Shepherd, Squadron-Leader D. Raeside, Dr. G. W. Pimblett and the radiological department of St. Bartholomew's Hospital, and Dr. H. Jungmann and the radiological department of the London Jewish Hospital for help with the radiological work; Prof. Sampson Wright for criticisms and suggestions; Air Commodore W. A. S. Duck, my old commanding officer, and Air Vice-Marshal Sir Stanford Cade, my senior surgical consultant in the R.A.F., with whose permission this work was done; and the many nursing sisters in the P.M.R.A.F.N.S. and the R.C.A.F. and R.A.F. radiographers for splendid coöperation in handling the patients.

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RAPID DETERMINATION OF URINARY PREGNANEDIOL

METHOD SUITABLE FOR ROUTINE CLINICAL USE

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THE Guterman (1944, 1945) qualitative test for urinary pregnanediol, based on the quantitative procedure developed by Astwood and Jones (1941) and Talbot et al. (1941), has been widely used for the early diagnosis of pregnancy and for prognosis in threatened abortion. Though there is some measure of agreement that the method may be useful in the prognosis of threatened abortion (Guterman 1946, Bender 1947, 1948, Merivale 1948), opinions on its value in the diagnosis of pregnancy are sharply divided. Guterman (1944, 1945) and McCormack (1946) have claimed an accuracy as great as that of the Friedman method; on the other hand, Reinhart and Barnes (1946) and Merivale (1948) have reported high percentages of both false positives and false negatives. In our opinion their unsatisfactory results are possibly due partly to technical deficiencies of the method, some of which are avoidable.

The Guterman test depends on the detection, by means of a colour reaction with sulphuric acid, of an amount of pregnanediol in 100 ml. of morning urine which is stated to correspond approximately to an excretion of 6–8 mg. of the steroid per 24 hours. Guterman considers a pregnancy test to be positive if this amount of pregnanediol or more is detected in the urine during amenorrhœa. Morrow and Benua (1946) have, however, observed "false positive tests for pregnancy" in the luteal phase of the menstrual cycle, and have pointed out at, since there may be a considerable overlap between e lower levels of pregnanediol excreted during early regnancy and the higher levels excreted during the tter half of the menstrual cycle, there is a danger of btaining false positive reactions in cycles prolonged by te ovulation. This criticism seems to be valid; but, rovided no reliance is placed on positive reactions obtained ithin a short time of an apparently missed period, he danger of diagnosing a delayed or prolonged luteal hase of the cycle as a pregnancy should not be serious.

Reinhart and Barnes (1946) criticise the method on ather similar grounds, pointing out that "a test which s not accurate in the face of vaginal bleeding is of estricted value as a diagnostic aid in hospital practice." Though this is doubtless true, we feel that their further tatement that "the source of error lies not in the nterpretation of the colour reaction but in individual ariations in the metabolism of progesterone, both in the regnant and the non-pregnant woman" cannot pass nchallenged. They seem *to* have overlooked the ossibility that a not inconsiderable source of both ositive and negative errors may lie in the technique of he stages in the method preceding the final colour sessment, and it is at least possible that they have ver-emphasised the importance of individual variations progesterone metabolism. The methods hitherto sed for studying the excretion of pregnanediol during he menstrual cycle and early pregnancy are insufficiently ccurate to show whether there are considerable individual ariations in the extent to which progesterone is reduced o pregnanediol in non-pregnant and pregnant women.

A general criticism that can be justifiably made of the Guterman method is that a quantitative significance has been attached to the results of a qualitative test. Attempts have been made by several workers to make the test quantitative rather than qualitative by examining the colour spectrophotometrically instead of visually. Such attempts, however, must necessarily fail in their object, since the test is carried out on an unknown fraction of the 24-hour urine output, and since, as recently shown by Sommerville et al. (1948), the procedure used for purifying the extracted pregnanediol is likely to give low and erratic results when applied to urine containing less than about 20 mg. of the steroid per 24 hours.

It seems clear that the value of pregnanediol determinations for diagnosis requires careful reinvestigation with the aid of a method more nearly quantitative and less open to criticism on technical grounds than is the Guterman procedure. The method of Sommerville et al. (1948), which has been shown to be reasonably accurate at levels of pregnanediol* excretion above about 2 mg. per 24 hours, would be suitable for such an investigation but is somewhat too laborious and time-consuming for routine use. Accordingly an attempt has been made to develop a procedure combining the speed and simplicity of the Guterman method with certain of the technical improvements made in the original Astwood and Talbot procedures by Sommerville et al. (1948). The method developed permits of the reasonably accurate quantitative determination in less than 3 hours of the pregnanediol in 100 ml. of urine, provided that the level of excretion is above about 5 mg. per 24 hours. It will probably be less liable than the Guterman method to give erratic results at low levels of pregnanediol excretion, but like the latter it

DETERMINATION OF URINARY PREGNANEDIOL

Urine	Recovery of pregnane-3(α), 20α-diol added to men's urine after acid hydrolysis				
	Pregnanediol added (mg.)		Pregnanediol recovered corrected for average male urine blank (mg.)		
	Per 100 ml. urine.	Per 24 hrs. urine	Per 100 ml. urine	Per 24 hrs. urine	% recovery
A	—	—	0·01 av. 0·02	0·17 av. 0·23	..
	—	—	0·02	0·25	
	—	—	0·02	0·28	
B	—	—	0·02 av. 0·02	0·27 av. 0·40	..
	—	—	0·03	0·54	
	—	—	0·02	0·40	
A	0·2	2·8	0·10	1·3	48
	"	"	0·05	0·71	26
	"	"	0·06	0·88	32
B	"	3·6	0·17	3·1	87
	"	"	0·11	1·9	53
	"	"	0·19	3·4	94
B	0·3	5·4	0·31	5·5	102
	"	"	0·25	4·5	83
	"	"	0·28	5·2	94
A	0·4	5·6	0·28	3·9	70
	"	"	0·24	3·3	60
	"	"	0·34	4·7	85
B	0·4	7·2	0·35	6·3	88
	"	"	0·34	6·1	85
	"	"	0·39	7·0	98
A	0·6	8·4	0·53	7·5	89
	"	"	0·47	6·6	86
	"	"	0·51	7·1	85
B	0·5	9·0	0·41	7·3	82
	"	"	0·43	7·7	86
	"	"	0·45	8·1	90

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* Unpublished work by Sommerville and Marrian has shown that *allo*pregnane-3(α), 20α-diol, as well as pregnane-3(α), 20α-diol, is determined by this method. In this paper the term "pregnanediol" is used to designate the mixture of both stereoisomers that is present in urine.

TABLE I—ÆTIOLOGY AND MORTALITY OF 100 CASES OF BRAIN ABSCESS

Source of abscess	No. of cases	Died	Case-mortality (%)
stoid infection	40	16	*40*
'emporal lobe	22	8	
'erebellar	18	8	
racogenic (bronchiectasis, empyma, or lung abscess)	20	13	*65*
astatic from "other sources" boils, carbuncles, cellulitis, infecive endocarditis, &c.)	11	2	*18*
ntal-sinus infection	10	1	*10*
etrating wounds and infected ompound fractures of skull ..	10	5	*50*
'ections of face, scalp, and skull..	7	2	*28*
erative infection of tumour cavity	2	0	*0*
Total	100	39	*39*

Several factors contribute to the high mortality of oracogenic abscesses. The patient is often already hausted by a severe thoracic infection, and the addition any further focus of sepsis adds to the strain. More *portant, however,* is *the fact that the stupor* and mobility which are common symptoms of brain abscess nd to reduce or even eliminate coughing and active pulsion of secretions from the lung. With this failure the pulmonary excretory mechanism the infection nds to spread rapidly through the lungs and the atient may even drown in his own secretions. Furthermore, the brain abscess is usually a complication of a *ntinuing* and chronic infection of the lung, and even the cerebral abscess is dealt with successfully there is lways the risk of another one developing as long as the ing or pleural infection persists. The problem thus ecomes something like that of dealing with intracranial etastases from lung cancer. Until the introduction of enicillin it was well-nigh insoluble. Now, however, not nly can the brain abscess often be successfully treated, ut, as we shall show, the thoracic infection can in some ases be subsequently eradicated by operation.

The thoracogenic abscess is usually multilocular, but he main mass is often single and discrete, and in only of our 20 cases were there multiple abscesses scattered hroughout the brain. This figure is slightly more favourble than that reported in other communications—for xample, in the collected figures of Collis (1944) there vere 63 multiple foci out of 153 cases of abscess. The bscess mass is usually in an accessible situation. Of the 6 cases in which it was single, the abscess was situated the distribution of the middle cerebral artery on the nvexity of the brain; 12 were above the sylvian sure in the frontoparietal region and 4 were in the mporal lobe. Elkington (1939) called attention to fact that metastatic tumours usually develop at the ction of grey and white matter, and this seems to be e of abscesses as well. In only 1 of the cases of multiple ess was there a deep-seated lesion and this was in ptic thalamus. In another case of multiple thoraco- brain abscesses a small abscess in the brain stem suspected, but since this patient recovered the ne lesion was not verified.

Bacteriology

available bacteriological data of 18 of our cases, rised in table II, show that the majority were due nisms which are sensitive to penicillin.

so many were pure infections is somewhat surn view of the mixed flora which may be found in pulmonary sepsis. Indeed, the incidence of mixed ions in this series is considerably lower than McFarlan (1943) found in a series of brain abscesses due to various causes; he found mixed infections in 14 of 48 cases of all varieties of brain abscess. This question is important because some of the organisms may be sensitive to penicillin or sulphonamides and some not. If, in dealing with the abscess, the brain is contaminated by the resistant organism another abscess or a fatal meningitis may result. Actinomyces and gram-negative organisms are especially dangerous, but it is interesting that in 3 cases in which gram-negative organisms were found in films the cultures were sterile.

It should also be noted that in all except 2 cases the brain abscess was the only focus of infection outside the chest. In one there were metastatic abscesses in the thigh, breast, and back, and in the other in the perinephric space. In 1907, Cameron made a similar observation and contrasted it with the frequency with which blood-borne abscesses from other sources (boils, carbuncles, infected wounds, &c.) were multiple. In our own series of 10 metastatic abscesses from other sources than the chest, 2 had obvious multiple abscess in addition to the brain abscess.

Technique of Treatment

In our experience the most effective method is to treat brain abscesses in such a way that they can eventually be dissected out. Such dissections require that the abscess should have a capsule thick enough to withstand reasonably careful handling during operation. The formation of such a capsule takes from five to eight weeks, by which time the abscess is really a chronic one; and the patient must be kept alive until this chronic stage is reached.

In most varieties of abscess this can usually be accomplished by repeated aspirations, though in some cases a decompression may be necessary, as advocated by Vincent et al. (1937). But in thoracogenic abscess aspirations are often difficult and ineffective because the abscesses are usually multilocular, their purulent contents are thick, and it may be impossible to remove enough pus to lower the intracranial pressure adequately, or to do so on more than one occasion. Moreover, the indication for further aspirations is often stupor or impending coma, and there may be several such phases in the process of tiding over the abscess from the acute to the chronic stage. Although periods of stupor may have no untoward consequences in other cases, patients with thoracogenic abscess respond badly because of the adverse effect on the pulmonary condition, as has been set out above. For these reasons we regard thoracogenic abscesses as generally unsuitable for the type of treatment which aims at radical removal in the chronic encapsulated stage.

TABLE II—BACTERIOLOGY OF 18 CASES OF THORACOGENIC ABSCESS

Findings	No. of cases	Film	Culture
Anaerobic streptococcus	6	+	+
Anaerobic streptococcus + fusiform bacilli	1	+	+
Pneumococcus	1	+	+
Staphylococcus aureus	1	+	+
Hæmophilus influenzæ	1	+	–
Actinomyces	2	+	+
Aspergillus	1	+	–
Diphtheroids	1	+	–
Gram-negative rods	1	+	–
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Sterile	2	–	–

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Thoracogenic (bronchiectasis, empyema, or lung abscess)	20	13	65
Metastatic from "other sources" (boils, carbuncles, cellulitis, infective endocarditis, &c.)	11	2	18
Frontal-sinus infection	10	1	10
Penetrating wounds and infected compound fractures of skull ..	10	5	50
Infections of face, scalp, and skull..	7	2	29
Operative infection of tumour cavity	2	0	0
Total	100	39	39

Several factors contribute to the high mortality of thoracogenic abscesses. The patient is often already exhausted by a severe thoracic infection, and the addition of any further focus of sepsis adds to the strain. More important, however, is the fact that the stupor and immobility which are common symptoms of brain abscess tend to reduce or even eliminate coughing and active expulsion of secretions from the lung. With this failure of the pulmonary excretory mechanism the infection tends to spread rapidly through the lungs and the patient may even drown in his own secretions. Furthermore, the brain abscess is usually a complication of a *continuing* and chronic infection of the lung, and even if the cerebral abscess is dealt with successfully there is always the risk of another one developing as long as the lung or pleural infection persists. The problem thus becomes something like that of dealing with intracranial metastases from lung cancer. Until the introduction of penicillin it was well-nigh insoluble. Now, however, not only can the brain abscess often be successfully treated, but, as we shall show, the thoracic infection can in some ases be subsequently eradicated by operation.

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It should also be noted that in all except 2 cases the brain abscess was the only focus of infection outside the chest. In one there were metastatic abscesses in the thigh, breast, and back, and in the other in the perinephric space. In 1907, Cameron made a similar observation and contrasted it with the frequency with which blood-borne abscesses from other sources (boils, carbuncles, infected wounds, &c.) were multiple. In our own series of 10 metastatic abscesses from other sources than the chest, 2 had obvious multiple abscess in addition to the brain abscess.

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Diphtheroids	1	+	—
Gram-negative rods	1	+	—
Gram-positive rods	1	+	—
Sterile	2	—	—

The introduction of penicillin has opened a new chapter in the treatment of brain abscess. If the infecting organism is sensitive to penicillin, we have a measure of control over the primary source of infection, whether it be in the lung, mastoid, frontal sinus, or elsewhere, and if the infection does extend to the brain it is our impression that it does so rather less catastrophically in patients treated with penicillin systemically than in the days before we had this agent. Penicillin and sulphonamides are powerful allies in the treatment of the meningitis which may result from leakage of the abscess during its development or from accidental contamination of the field during an operation for its removal. In suitable cases penicillin injected into the abscess cavity at the time of aspiration may render it sterile, and in the process of tiding over an acute abscess to the chronic stage we make a practice of injecting penicillin into the cavity after each aspiration.

The evidence for the potency of penicillin in combating intracranial infections is so abundant that the possibility of treating acute abscesses by radical methods is being explored. In one of our cases (case 1) an abscess was sucked out by open operation when it was only ten days old, the resulting cavity being dusted with penicillin-'Sulphamezathine' powder and filled with a solution of penicillin. Le Beau (1946) has reported 17 such cases (3 of them thoracogenic) with recovery in 14. Such operations are less "anatomical" than those for the removal of a chronic encapsulated abscess, in that it is necessary to suck out pus and infected-looking brain until normal white matter is reached, and consequently more cerebral tissue is sacrificed than in the removal of a chronic abscess. This is important when, as often happens, the abscess is situated in an eloquent part of the brain. Some of the total functional deficit may be due simply to pressure and œdema around the abscess, but most of it is due to permanent cerebral damage, and however they are treated the survivors often show a considerable degree of permanent weakness, sensory loss, aphasia, or loss of the visual field. This is in contrast to other types of abscess, such as those due to mastoid or frontal-sinus disease, in which residual disabilities are minimal.

With these advances in the management of brain abscess, the focus of interest now centres on what can be done to the primary thoracic lesion to prevent re-infection of the brain. That re-infection may occur is shown by the following case (R. I. no. 19741).

In June, 1941, a man of 28 developed a left-sided pneumonia followed by empyema. This was treated by aspiration, rib-resection, and drainage, and on Nov. 18 a modified thoracoplasty. The chest continued to discharge, and on Nov. 22 he began to have focal epileptic attacks involving the left side of the body, followed by a rapidly progressive left hemiplegia. A ventriculogram revealed an abscess in the right frontoparietal region and it was aspirated through a burr-hole on Dec. 16. There was some improvement, but the onset of coma and incontinence two days later called for further treatment, so a decompression was made over the abscess. This brought about considerable improvement in his general condition, but the decompression area bulged and became so tense that we feared it would burst. Temporary relief could be obtained by repeated lumbar punctures and the patient was kept alive by this means until Jan. 8, 1942, when it was judged that the abscess was at least forty-seven days old and should be sufficiently encapsulated to be dissected out. A large multilocular abscess mass weighing 120 g. was extirpated from the right frontoparietal region. The patient improved generally and the wound healed normally. Two weeks later signs of an abscess in the left temporal region appeared and this was treated by aspiration and decompression for six weeks, after which we extirpated an abscess mass in the left temporal lobe as large as that which had been removed from the right hemisphere. He died three weeks later with yet a third abscess in the left frontal lobe. It was known that the abscesses in the left hemisphere developed after the one in the right hemisphere because the original ventriculogram had shown that the left hemisphere was normal.

This case emphasises the risk of the continuing chest infection. Had it been possible to arrest this before the second and third abscesses developed, the patient's life might have been saved. In the 2 cases to be described next, the pulmonary lesion was such that it could be dealt with radically after the brain abscess had been extirpated.

CASE 1

Chronic bronchiectasis. Left cerebral abscess, treated by excision in acute stage. Pneumonectomy. Recovery. (R. I. no. 10835.)—A man, aged 21, was admitted on Jan. 18, 1946. He had been in another hospital for six weeks suffering from an acute exacerbation of chronic bronchiectasis which he was known to have had for three years. The infection seemed to be resolving satisfactorily but on Jan. 12 he had a focal sensory attack in his right arm followed by considerable weakness of the right arm and leg. In the next two days he had further attacks of the same nature, each leaving him with rather more weakness than before, so by the time he was admitted his right arm and leg were completely paralysed. The right side of his face was not affected and there was no aphasia or hemianopia. He had very little headache, the optic discs were normal, and the spinal fluid was normal in pressure and content. While under observation he became more drowsy and by Jan. 21 the spinal-fluid pressure had gone up to 240 mm. water though the fluid was still normal on analysis. Radiography of the skull revealed no abnormality. There was extensive advanced bronchiectasis in the right lung.

By Jan. 22, ten days after the onset of the cerebral infection, he was deeply comatose and it was clear that desperate measures were justified. Under local anæsthesia a left lateral flap was reflected. The dura was tense, and before it was opened the right ventricle was tapped and 12,000 units of penicillin instilled. On opening the dura the convolutions in the upper part of the left bolandic region were seen to be broad and pale, with a slight brownish-yellow discoloration in an elliptical zone 6·5 cm. from before back by 5 cm. from side to side. The arachnoid was divided around this zone and immediately beneath the cortex a large multilocular abscess was encountered. It had no definite capsule, though in places there were patches of toughness doubtless due to thickening of the leptomeninges in the sulci. The abscess mass was sucked out until normal-looking white matter was encountered. This made a large cavity lined by œdematous white matter, but the brain was quite slack and it was possible to see a considerable part of the superolateral surface of the left hemisphere which appeared to be normal. As the cavity was inevitably contaminated, it was dusted with penicillin-sulphamezathine powder and 20,000 units of penicillin in solution was left in it. The dura was closed, the bone flap replaced, and the scalp closed without drainage. The pus from the abscess yielded anaerobic streptococci in films and culture.

The wound healed normally and at the end of three weeks the spinal fluid was normal. A transient aphasia cleared up by the end of a week after operation, but the patient was left with complete paralysis of his right arm and leg. The leg subsequently recovered to the point where he was able to get about quite comfortably though the arm remained virtually useless. His chest condition remained quiescent as his general state improved, but since there had been repeated acute exacerbations of the lung infection, a further one of which might be fatal or cause another brain abscess, it was felt that his best chance rested in removal of the infected lung. The pulmonary condition was accordingly assessed and it was found that there was a chronic and extensive saccular type of bronchiectasis confined to the right lung.

On May 30 a dissection pneumonectomy was performed, the lung being very adherent to the chest wall. The patient made an uneventful recovery, and his vital capacity within six weeks of operation was equal to the preoperative figure. When last seen in November, 1947, he was training in leather-work at a rehabilitation centre. He had had no further trouble with his chest. The right leg was spastic but he could walk easily for long distances. The right arm had improved to some extent, but it was still so stiff and weak that it could only be used for gross purposes.

Pathologically the lung showed gross inflammatory changes associated with bronchiectatic saccules. There was considerable fibrosis, and in one area there was a large scar which was regarded as being the possible seat of a healed abscess. In this area there was thrombosis and recanalisation of vessels. The possible significance of this finding and of the density of the pleural adhesions will be discussed later.

As a matter of interest it should be recorded that a brother of this patient had died of a brain abscess following an empyema.

CASE 2

Chronic bronchiectasis. Multiple metastatic abscesses. Right parietal abscess treated by excision. Pneumonectomy. Recovery. (R. I. no. 41226/45.)—A woman, aged 28, suffered from bronchiectasis dating from childhood, presumably beginning with an attack of "pneumonia" at the age of 7. She had been in hospital several times with signs of pulmonary suppuration such as fever, cough, and purulent sputum, and in July, 1945, a small left-sided basal empyema was recognised and drained at the Harefield Thoracic Unit. Closure of this cavity was slow since it was presumably secondary to the underlying lung infection.

During the next three months suppuration developed in the chest wall and spread into the submammary region, where it was incised and drained. Shortly afterwards an abscess appeared on the back of the right thigh; this was presumably of metastatic origin and was also drained.

In spite of this continued suppuration the patient's general health remained fairly good until Jan. 29, 1946, when she had an epileptic attack with loss of consciousness, ushered in by a sensation of bright lights. In the next three weeks she had 3 similar fits, complained of a good deal of headache, and noted a haziness in the left field of vision.

On admission, on Feb. 20, 1946, she was alert and coöperative and looked very well, despite discharging sinuses in the left chest and in the left breast and right thigh. From the chest *Proteus vulgaris* and diphtheroids were cultured, and from the thigh *Staph. aureus*. She was afebrile, the pulse-rate was 80 per min., and the respiration-rate 20 per min. Neurological examination revealed no papillœdema, but there was a lower quadrant defect in the left homonymous visual field. There was no sensory or motor disturbance in any part of the body, except that the left plantar response was extensor. The spinal-fluid pressure was 100 mm. water. The fluid contained 60 mg. protein per 100 ml. and 2 cells per c.mm. Radiograms of the skull were normal, but those of the chest showed opacity of the lower half of the left lung field.

She was kept under observation, and 25,000 units of penicillin was given intramuscularly every three hours. She continued to complain of headache, and repeated examination of the visual fields showed that the lower quadrant defect was extending to involve the upper quadrant. There thus seemed no doubt that there was a progressive lesion in the right parieto-occipital region, and an abscess secondary to pulmonary sepsis seemed the most likely diagnosis.

By March 12 it was estimated that the abscess was at least six weeks old and that radical extirpation should be possible. A ventriculogram on this date confirmed the localisation and at operation a multilocular abscess mass was dissected out of the parieto-occipital region. The main mass had a tough wall, but one small loculus ruptured and a few drops of pus escaped into the field, which was technically contaminated. No organisms were seen in films and cultures were sterile. The cavity in the brain was dusted with penicillin sulphamezathine powder and 20,000 units of penicillin in solution was left in it. The left ventricle was also treated with 12,000 units of penicillin at the beginning of the operation. The dura was closed, the bone flap replaced, and the scalp closed without drainage.

The wound healed normally, but her convalescence was marred by an aseptic meningitis, the fluid containing up to 5000 cells for ten days after operation. No organisms were seen in films, nor were any cultured. The meningitis was treated with sulphadiazine by mouth and 12,000 units of penicillin intrathecally every day for sixteen days. By April 1 she was free from symptoms, the fluid contained 60 mg. protein per 100 ml. and 28 cells per c.mm. Neurological examination revealed only a lower quadrant defect in the left homonymous field of vision.

The relation between cerebral and chest conditions had been carefully borne in mind, and it was decided that removal of the septic pulmonary focus should be undertaken with the minimum of delay. Accordingly she was returned to the Harefield Thoracic Unit, where a bronchiectatic left lower lobe and lingular process were removed on April 18. The lung was firmly adherent, but was removed without incident by dissection of the areas described, and convalescence was uneventful. When she was discharged in June, 1946, the chest had healed and lung expansion was adequate.

Thereafter she remained well, except that she had two epileptic attacks in the first six months after the cranial operation. These were mild and did not recur in the ensuing fourteen months.

It should be noted that in this case pulmonary lobectomy was performed within four weeks of the excision of the brain abscess and that the patient withstood these two major interventions remarkably well. This probably illustrates the maximum of our present therapeutic powers, but has demonstrated that a combined thoracic and neurological attack is a possibility, and should be considered wherever practicable.

If the brain abscess develops during the course of a chest infection which is going to resolve spontaneously or respond to radical treatment, the problem is simply that of dealing with the brain abscess and is similar to that of a metastatic brain abscess from "other sources" (table I), in which the mortality in our cases has been 18%. Cases 3 and 4 illustrate this point.

CASE 3

Lung abscess following gastrectomy for pyloric stenosis. Spontaneous resolution. Left frontal brain abscess treated by excision. Recovery. (R. I. no. 21249/44.)—A man, aged 37, was admitted to the Radcliffe Infirmary on Jan. 12, 1944. In February, 1943, he had a partial gastrectomy for pyloric stenosis following a perforated duodenal ulcer ten years before. The operation was done under local anæsthesia, and convalescence was interrupted by sepsis in the abdominal wound and an abscess in the left lung. The lung abscess was studied by repeated X rays and it appeared to resolve spontaneously, presumably by discharging into a bronchus and being coughed up. The abdominal wound healed, and he was discharged from hospital on March 31, 1943, still having a good deal of cough and sputum. This improved steadily until by September, 1943, he had no cough or sputum and X-ray films of the chest were normal.

In June, 1943, he began to have focal epileptic attacks involving the right arm and leg, and during the next five months a considerable right hemiplegia developed and he began to suffer from headache. These symptoms led to his admission to hospital, when it was found that he had bilateral papillœdema, a slight nominal aphasia, and a profound right hemiplegia maximal in the arm. There was slight sensory impairment of cortical type in the right arm and leg. The visual fields were full. The spinal-fluid pressure was raised, and the cerebrospinal fluid contained 50 mg. protein per 100 ml. and 20 cells per c.mm., mostly lymphocytes.

The presumptive diagnosis was chronic abscess in the left rolandic region due to the previous lung infection. A ventriculogram confirmed the localisation and at operation on Jan. 25, 1944, the abscess was dissected out intact. On section it was bilocular, and its walls were up to 0·4 cm. thick. The pus was creamy and yellow; no organisms were seen in films and cultures were sterile, but histological preparations showed a profuse branching mycelium resembling aspergillus. Convalescence was uneventful. The wound healed normally and six days after operation the spinal fluid had reverted to normal (35 mg. protein per 100 ml., 2 cells per c.mm.). The aphasia cleared up, and the right arm and leg improved considerably to the point where he could get about quite comfortably. He remained well in the ensuing three and a half years.

CASE 4

Chronic empyema. Left frontal abscess, treated by aspiration and excision. Recovery. (R. I. no. 37322/45.)—A man, aged 45, came under observation on Feb. 2, 1945. He had a chronic right-sided empyema, which was drained on Jan. 8, 1945, and the chest condition seemed to be progressing favourably. On Jan. 28 he had a small hæmoptysis and later in the day a generalised epileptic attack. Apart from some headache there were no sequelæ. Next day he had a succession of attacks ushered in by aphasia and characterised by turning of the head and eyes to the right side, and clonic movements of the right side of the face and right arm and leg. These attacks left him with some aphasia and considerable weakness down the right side of the body. The hemiplegia became more marked and by Feb. 7 it was virtually complete. The aphasia likewise became more profound and he gradually became more stuporous. The spinal-fluid pressure was 210 mm. water, and the fluid contained 120 mg. protein per 100 ml. and 14 cells per c.mm.

An abscess in the posterior part of the left frontal lobe was suspected and a burr-hole was made over the supposed site on Feb. 7; 30 ml. of pus was aspirated from a depth of 4·5 cm. in the frontal lobe, and 10,000 units of penicillin and 3 ml. of thorotrast were instilled into the cavity. Subsequent X-ray films showed the abscess occupying the upper and posterior part of the frontal lobe. The pus contained numerous gram-negative rods, but cultures were sterile.

The patient improved steadily after aspiration. Although some aphasia persisted he became quite alert and rational and the headache disappeared. The hemiplegia likewise cleared up. Successive X-ray films showed that the abscess remained about the same size—i.e., it did not shrivel up as happens with some abscesses which resolve simply with aspiration. On April 6, when it was reckoned that the abscess was about ten weeks old, an osteoplastic flap was reflected and the chronic thick-walled abscess was dissected out intact. Convalescence was uneventful and he was discharged from hospital on April 20 free from symptoms or signs except for a very slight speech defect, apparent on formal tests. The chest wound meantime had healed and he remained well up to the time of the last follow-up in February, 1948, apart from occasional epileptic attacks which do not interfere with his work as a labourer.

These cases were favourable because the chest infection had cleared up or responded to treatment by the time the brain abscess was dealt with, and there was no risk of further trouble from the chest. The next 2 cases emphasise the risk of the continuing chest infection, and show that the chest infection carries its own risk as well as that of recurring or multiple metastatic infection in the brain.

CASE 5*

Diffuse actinomycosis with widespread pulmonary lesions. Intensive penicillin therapy. Right cerebral abscess treated by excision. Recovery. (R. I. no. 59241/46.)—A man, aged 46, began, in July, 1944, to complain of vague abdominal symptoms associated with an intermittent temperature. In January, 1945, a pelvic mass pressing on the rectum was detected, and a laparotomy in March revealed a tumour adherent to the rectum. The abdominal incision healed with the formation of three sinuses, from which in July actinomyces were isolated. In November he was critically ill with an abscess of the liver which ruptured into the lung and caused a diffuse bronchopneumonia. There was a fæcal fistula in the abdominal wound, and an ulcer on the tongue and one in the left arm. He was treated with large doses of penicillin (a million units a day) and there was some general improvement. In December there was a relapse in the chest condition, but again this settled down.

On June 9, 1946, the patient complained of headache for the first time. Two days later he had a focal sensory attack in the left hand and arm, and next day there was a nearly complete paralysis of the left arm and considerable weakness of the left leg. These signs remained more or less stationary but he continued to complain of headache.

He was admitted to the Radcliffe Infirmary on June 28, at which time there was slight bilateral papillœdema and a considerable left hemiplegia, maximal in the arm. There was some loss of sensibility of the cortical type in the left hand but no defect in the visual fields. He was in good general condition, however, and could get about with a hemiplegic gait. Radiograms of the chest showed changes compatible with hepatic and pulmonary actinomycosis. The erythrocyte-sedimentation rate was 60 mm. in 1st hour and the white-cell count was 8000 per c.mm. Actinomyces were found in the sputum. A ventriculogram showed a depression of the central part of the body of the right ventricle and a slight displacement to the left side. At operation on July 6 a subacute abscess was removed from the right frontoparietal region. The abscess measured about 2 cm. in diameter, had a very thin wall and contained about 6 ml. of pus. Some diphtheroids were seen in films, but cultures of the pus were sterile and histological examination of the abscess revealed no evidence of actinomyces.

The postoperative period was stormy for a few days because of exacerbation of the chest infection, but he gradually recovered from this. The cranial wound healed normally, and, though there was a transient increase in the hemiplegia, this too recovered to the level which obtained before operation—i.e., he was left with considerable weakness of the left arm and slight weakness of the leg, but he could get about quite easily. The headache cleared up and the papillœdema disappeared. He returned to work and remained well apart from an isolated epileptic attack. When last seen twenty-two months after operation he still had bronchiectasis for which he was receiving daily inhalations or injections of penicillin, but his general state was satisfactory.

This case is significant because it suggests that massive doses of penicillin have a favourable influence on actinomycosis; by the time the abscess was excised the patient had already received some 300 million units of penicillin. Secondly, it shows that the brain abscess may be due to only one of several organisms responsible for the chest infection. The preoperative diagnosis in this case was an actinomyotic abscess or granuloma, because it was known that the patient had pulmonary actinomycosis. But in fact the abscess was due to a gram-negative bacillus which presumably was only one of several which might have been found in the lung. As the chest infection still persists, this patient would be in a somewhat hazardous state if he did not continue to have penicillin.

CASE 6

Chronic bronchiectasis. Metastatic abscesses in left loin and left temporal lobe. Drainage of perinephric abscess. Excision of brain abscess. Recovery. Death later from acute pulmonary infection. (R. I. no. 64710/46.)—A man, aged 66, was admitted to the Radcliffe Infirmary on Nov. 8, 1946, with aphasia and a right hemiplegia. He had had bilateral bronchiectasis for about twenty years, and for nine months before admission his cough had been more troublesome and the sputum more abundant, and there had been occasional small hæmoptyses. Nevertheless he could do his work as a grocer until six weeks before admission, when he had a fit (which was not reliably observed) and began to suffer from severe headache. Three weeks before admission he began to have difficulty in expressing himself. A week later he complained of severe pain in the left loin and within a few days a swelling appeared. This was incised and drained, and it had practically healed by the time he was admitted to the Radcliffe Infirmary. The pus from the abscess yielded *Staph. albus* on culture. In the week before admission a profound weakness of the right side of the body developed and the speech difficulty was more pronounced.

On admission he was conscious but drowsy, and there was gross aphasia affecting all aspects of the speech function. He was thin and pale, and had a loose cough with purulent sputum. The optic discs were normal, but a complete right homonymous hemianopia could be demonstrated. There was a nearly complete right hemiplegia affecting face, arm, and leg, and he seemed to resent painful stimuli less on the right side of the body than the left. The spinal-fluid pressure was 165 mm. water, the fluid contained 250 mg. protein per 100 ml. and 300 cells per c.mm., 92% being polymorphs. Radiograms of the skull showed no abnormality except slight displacement of the pineal gland to the right. The chest showed advanced bilateral bronchiectasis on radiography and clinical examination.

The presumptive diagnosis was abscess of the left cerebral hemisphere due to the bronchiectasis. An arteriogram showed that the abscess was in the left temporal lobe. A left lateral osteoplastic flap was reflected on Nov. 12 under local anæsthesia. The dura was tense, and before it was opened the right ventricle was tapped and 12,000 units of penicillin was instilled. The convolutions in the left temporal lobe were broad and pale, but the abscess was not presenting on the surface as is often the case. The middle temporal convolution was excised and this exposed the capsule of the abscess. There proved to be two main loculi with walls thick enough to allow them to be dissected out intact, but there were also many smaller loculi clustered about these which had to be removed with the sucker. The cavity was thus contaminated with pus from these smaller loculi. The suction was continued until normal white matter was reached, and this meant removing the interior of almost the entire temporal lobe. The cavity was dusted with penicillin sulphamezathine and 20,000 units of penicillin was instilled. The dura was closed completely, the bone flap replaced, and the scalp closed without drainage.

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* This case is to be reported at length elsewhere.

Convalescence was uneventful. The wound healed normally, nd ten days after operation the spinal-fluid pressure was ormal and the fluid was clear and colourless and contained 0 mg. protein per 100 ml. and 8 cells per c.mm. He was much brighter and more alert, but the neurological abnormalities remained much as before operation. He was got out of bed a fortnight after operation and was discharged on Nov. 29, 946. He remained well for two months, when he got a severe cold and developed bronchopneumonia, which proved fatal within a few days. No autopsy was done, but the physician who attended him said that it seemed to be a straightforward respiratory illness without any evidence of a recurrence of the ntracranial infection.

Discussion

Several points emerge from a consideration of these cases. It is clear that now that penicillin is available the difference between success and failure in their treatment is determined largely by the nature of the chest infection. If a brain abscess develops during the course of a chest infection which is resolving or is likely to do so (as in cases 3 and 4) the outlook should be reasonably good. Such cases are unfortunately rare; in the majority the chest infection is a chronic one unlikely to resolve or respond to conservative treatment, and it continues to menace the patient's life on its own account (as in case 6) besides being a potential source of metastatic abscesses. The elimination of chest sepsis, or at any rate its control by minor surgical and palliative measures, should always be attempted, so that the risk of cerebral infection is minimised. We feel too that the thorough and long-continued administration of penicillin parenterally is a useful prophylactic measure, and that if a cerebral infection does arise in spite of penicillin prophylaxis its virulence will be somewhat lessened, as in case 5.

If the infection is confined to one lung (as in cases 1 and 2) or is otherwise within the scope of radical thoracic surgery, we may reasonably expect a cure, and we feel that in every case of thoracogenic abscess the possibility f a combined attack by the neurological surgeon and he thoracic surgeon should be carefully considered. In many cases advanced bilateral pulmonary disease will mean that there is slight hope of a permanent cure, but n some of these (as in case 5, with bilateral pulmonary actinomycosis) once the brain abscess has been successully treated the patient may continue to lead a useful ife with the aid of penicillin. In others removal of the brain abscess may bring about an unexpected improvement in the chest condition. We feel indeed that every thoracogenic brain abscess should be treated, no matter how discouraging the chest infection may appear to be.

Often the patient is too ill to withstand any major procedure when he first comes under observation; this is usually due to a combination of increased intracranial pressure and an exacerbation of the pulmonary infection. In such cases probably all that can be done is to make a burr-hole over the abscess, aspirate as much pus as can be got out, and hope that this will tide over the crisis and enable a more deliberate attack to be made within a few days when the general condition has improved.

If the circumstances allow deliberate treatment, we would encourage removal of the brain abscess as soon as it begins to produce stupor or respiratory depression, whichever is manifest first. In some cases severe paroxysmal headache is the indication for operation; this is usually the result of a critical rise of intracranial pressure and it may cause death without antecedent stupor or respiratory depression. Neurological deficits are of less importance as indications for operation; thus a patient may have a considerable hemiplegia or hemianopia for days or weeks before there is much headache or any stupor or respiratory embarrassment.

If the abscess is to be removed, precise knowledge of its location is essential. In some cases this will be apparent from the clinical examination; in others arteriography is probably the safest diagnostic procedure since it does not disturb the pressure relationships within the cranium. If this is not available or does not provide adequate information, then ventriculography may be called for, though we regard this as more dangerous in abscesses than in tumours. If the abscess has to be sucked out in the acute stage, the resulting cavity should be treated with penicillin at the time, and the dura and bone flap should be dusted with penicillin sulphamezathine powder. The bacteriology of the abscess should be established as soon as possible so that appropriate chemotherapy and antibiotics can be supplied. The wound should be closed without drainage, as in the case of removal of a chronic abscess or a brain tumour.

In most cases the brain abscess should be dealt with first because it constitutes the more immediate threat to life. Nevertheless, it is important to proceed with the chest operation as soon as possible, and case 2 demonstrates that a patient can tolerate major intracranial and thoracic operations within four weeks of each other. In some straightforward cases the interval may be shorter with advantage; in others it may have to be longer because of complications ensuing on the cerebral operation, such as a bout of meningitis or a temporary exacerbation of the pulmonary infection.

It is worth noting that in most of the successful cases the patient was under observation at the onset of the cerebral infection and that the diagnosis was made in the early stages. We cannot emphasise too strongly that the advent of cerebral symptoms—usually an epileptic attack—in a patient suffering from pulmonary infection calls for immediate neurological diagnosis and observation. Operation may have to be undertaken as an emergency, and if the patient has been in deep stupor or coma for several hours before he can be got into neurological hands his chances of survival are greatly diminished. Cerebral symptoms, such as epileptic attacks, may occur with air-embolism, but in these cases recovery is usually prompt, there are no residual neurological defects, and the cerebrospinal fluid is normal.

We have produced no definite evidence as to how the infection gets from the chest to the brain, but from the mode of onset and the distribution of the lesions we think that they probably result from embolism. It has been suggested by Collis (1944) and others that there is a retrograde infection along the intercostal veins, thence to the spinal veins, and thence to the cranium. If this was the case we would expect to encounter abscesses en route—i.e., in the spinal cord and posterior cranial fossa—but in fact such lesions are almost unknown. The most cogent argument against the embolic theory is the relative infrequence of metastatic abscesses in other regions than the brain. But this also applies to other blood-borne infections, where the brain may be the only site of abscess formation. The vagaries of embolism are further seen in cases in which there may be embolic abscesses in almost every organ except the brain. The mechanism of the infection is not entirely an academic consideration; in many cases the cerebral infection appears shortly after some minor operation on the chest wall, such as dilating a sinus, and the theory of retrograde infection has this in its favour.

Our chief concern has been with treatment, and we feel that there is now some hope in dealing with this serious complication of chest disease, although we realise that not every case can be cured, and that some of the patients who recover will be left with considerable neurological disabilities.

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WEIL'S DISEASE

ANALYSIS OF 195 CASES IN ENGLAND

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THE serological diagnosis of Weil's disease (leptospirosis icterohæmorrhagica) has been carried out in these laboratories for many years, and some of the results have been reported previously (Alston and Brown 1937, Broom and Brown 1943). Between the beginning of 1940 and the end of 1946 samples of blood were received from 195 positive cases and, where possible, the following information was obtained about each patient: sex; age; probable method of infection; presence or absence of jaundice; and recovery or death. Not all these details are available for every patient, but sufficient have been received to make an analysis of interest.

The diagnostic criterion was the agglutination of a formalinised culture of *Leptospira icterohæmorrhagiæ* observed by the microscopical technique described by Schüffner and Mochtar (1926).

Agglutination of leptospiræ by serum from persons who have not been exposed to infection is very rare, even in serum dilutions of 1/10 or 1/30. Artefacts and certain non-specific precipitations are seen with some sera but are readily differentiated from true agglutination by their microscopical appearance. In practice, therefore, any degree of agglutination is regarded as suspicious but, when the titre was 1/300 or less, further samples were examined, where possible, to test for the rise in antibody content which takes place during the disease. This precaution is particularly necessary when the patient's occupation may previously have exposed him to infection.

EPIDEMIOLOGY

Method of Infection.—The prevalence of Weil's disease among coalminers, fish cleaners, and workers in sewers and on the land has long been recognised; so has its occurrence after bathing in canals and stagnant rivers. These associations are all represented in the present series as follows:

Farm workers ..	23 (12 %)	Handlers of food ..	8 (4 %)
Sewer ,, ..	22 (11 %)	Navy personnel ..	2 (1 %)
Fish ,, ..	13 (7 %)	Army personnel ..	47 (24 %)
Coalminers	12 (6 %)	Air Force personnel	8 (4 %)
Bathing	9 (5 %)	Miscellaneous ..	22 (11 %)
Accidental immersion	3 (1 %)	Unknown	13 (7 %)
Working in water ..	13 (7 %)	Total ..	195 (100 %)

Patients who had been working in water are grouped separately because the portal of entry of the infection was probably different from that in the bathers. The group includes men working on bridge repairs, watercress beds, and river drainage and conservancy schemes, where infection through the conjunctivæ and mucosæ of the nose and mouth is unlikely. The miscellaneous group is of special interest because it illustrates some of the diverse conditions in which infection may take place. Leptospiræ shed in rat urine can live for considerable periods in wet surroundings if the reaction is slightly alkaline. Infection may thus occur though there is no direct contact between rat and human, provided that rats can contaminate material which is afterwards handled by man. Persons believed, because of the known presence of rats, to have been infected at work included fishmongers, butchers, waiters, kitchen porters, refuse collectors, sailors, bricklayers, carpenters, motor mechanics, dock labourers, and workers in a factory preparing compressed cattle food. Two other patients had lain in wet ditches as the result of motor-car accidents; two children were apparently infected while playing in rat-infested bombed buildings; one man was an A.R.P. warden; another was in the habit of drinking water from a ditch where rats abounded; and a third worked at a dog-racing track.

Details about patients in the Armed Forces were generally not available, but some of the patients were infected during manœuvres, and others on active service in Italy and Normandy; one was probably infected while lying in a wet ditch tending a wounded man.

A certain piquancy attaches to the case of the ship's stoker who, when asked about possible contact with rats, told how the crew of his ship were in the habit of preparing tea in a large urn kept constantly hot on the galley stove. Water and dry tea were added as required but the spent tea leaves were removed only at irregular intervals. On one of these occasions a rat "boiled white" was found in the debris.

Sex.—The sex-incidence of 189 known cases was males 181, females 8 (4·4%), showing the usual preponderance of males which probably reflects the greater risk of infection in certain predominantly male occupations avocations and does not indicate a real difference i susceptibility. The proportion of females is much higher when the chances of infection are equal for the two sexes. Thus Smith and Davidson (1936) obtained evidence of equal rates among male and female workers handling fish in Aberdeen.

AGE-INCIDENCE OF CASES OF WEIL'S DISEASE AND RECOVERIES AND DEATHS THEREFROM

	Age (years)						
	Up to 15	16–30	31–45	46–60	Over 60	Total	Unknown
No. of cases	12	31	31	21	5	100	95
No. of deaths ..	2	4	4	6	3	19	6
No. of recoveries ..	10	19	22	15	2	68	21

Age.—The accompanying table shows the distribution of cases by age, known for 100 patients. As is to be expected in view of the ætiology of Weil's disease, the very young and the aged are less often affected than those in the prime of life.

Case-mortality.—The final result is known in 114 instances. There were 89 recoveries and 25 (22%) deaths, a very high mortality compared with the 9·4% reported for Holland (Walch-Sorgdrager 1939). During the period covered by our cases, and also in England, Gardner and Wylie (1946) found a mortality of only 8·8%. The two rates are not comparable, however, because Gardner and Wylie assumed the recovery of every patient who was not known to have died, whereas we include only those cases in which the outcome was recorded. If it were calculated on the basis of the total number of cases, the mortality in our series would be reduced t 13%.

The age-distribution of recoveries and deaths in t 87 cases for which it is known is shown in the table.

Jaundice.—Different observers have found the pr portion of cases with jaundice to vary over a wide range. Inada et al. (1916) state that "jaundice is the most striking and constant symptom"; but, also in Ido and Wani (1917) reported that of 56 cases seen d an epidemic 33 (60%) were anicteric. Schüffner (193 noted over a period of years in Holland that the p portion of anicteric cases rose as the annual num of cases increased, suggesting that a more acute a ness of the condition led to the diagnosis of many atyp cases which would otherwise have been missed. Schüff considers that 60% of the total is probably a good estimate of the number of anicteric cases of leptospirosis. In Great Britain Buchanan (1927), describing an outbreak of Weil's disease among coalminers, records that jaundice was present in all 22 patients. Davidson et al. (1934), investigated 15 cases, in 11 of which there was jaundice. On the other hand, Buzzard and Wylie (1947) report 5 consecutive anicteric cases and contrast them with 10 previous cases, 7 with jaundice, treated in the same hospital.

Records are available for 120 cases in our series; jaundice was present in 107 and absent in 13, which makes the proportion of anicteric cases only 10%.

DISCUSSION

The large proportion of jaundice and the high mortality are both outstanding features in this series. The two might be considered to be related, because Walch-Sorgdrager (1939) states that only one fatal anicteric case had been reported in Holland, and certainly all except one of our fatal cases were accompanied by jaundice. It appears from the published reports that jaundice is more often absent when infection takes place during bathing, and only 9 of our patients were infected in that way. Unfortunately, a record is available of only 4, but jaundice was present in all of these 4. When the mode of infection of the 13 anicteric cases was examined, it was found that 2 children had paddled but not bathed in a river known to be infective. The other patients were 4 farm workers, 1 fish worker, 1 tripe-factory lorry-driver, 1 canteen worker, 1 child who played in a bombed building, 2 soldiers whose history is unknown, and 1 schoolgirl with no known contact with rats but who certainly had not been bathing.

There is thus no relation between bathing and absence of jaundice in this series, and some other reason must e sought for our findings. One explanation might e that these are all hospital patients, representing mainly e more severe infections, whereas milder cases are eated at home without the diagnosis being confirmed y serological tests. In this connexion one group of 0 cases is of particular interest. They were all diagnosed y one physician and they form the contemporary part f the series described by Robertson (1946). Of these 0 cases 8 were anicteric as compared with 5 among he remaining 100. The number involved is small, but he difference is very striking, and the probability of btaining such a difference as the result of chance is less han 0·001—i.e., it is statistically significant. Of this ame group 5 patients were females, whereas only 2 ases were diagnosed in females in the remaining 169. In this instance also the probability for a chance result is less than 0·001.

When these findings are considered along with Buzzard and Wylie's (1947) 5 anicteric cases, it seems reasonable to assume that many cases of leptospirosis are missed because they do not present the classical symptoms of Weil's disease, or because the patient was not employed in one of the occupations recognised as carrying a risk of infection.

SUMMARY

Details of sex, age, method of infection, presence of jaundice, and final outcome are analysed for 195 cases of leptospirosis diagnosed by serological tests.

Attention is drawn to the diversity of the occupations and avocations in which infection may take place, and examples are given.

The jaundice-rate and mortality were unusually high. Evidence is adduced which suggests that many cases of leptospirosis are missed in this country.

We wish to thank the many clinicians and pathologists who have provided us with details of these cases.

References at foot of next column

ACUTE INTESTINAL OBSTRUCTION IN TYPHOID FEVER

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ACUTE intestinal obstruction due to, and arising in the course of, typhoid fever appears to be extremely rare. The following case had unusual features.

CASE-RECORD

A private in the A.T.S., aged 20, was admitted to Purdysburn Fever Hospital on Oct. 8, 1946. She had reported the previous day with a fresh crop of old-standing psoriasis, for which treatment was ordered. That night she developed a severe headache, had a restless night, and felt sore all over. On reporting these symptoms she revealed that she had recently spent two weekends in a neighbouring town where there was an outbreak of typhoid fever. She thus reached hospital with a provisional diagnosis of typhoid about 16 hours after the onset of symptoms—the earliest admission of a case of typhoid in my experience. According to her Army pay-book she had received two injections of T.A.B. during July, 1944.

Investigation.—Temperature 101·4°F; pulse-rate 120 per min.; complained only of headache and shivering. Widal test on day of admission positive only to *Salmonella typhi* (0-specific) to a titre of 1/25; no flagellar agglutination. Sample of stools on same day showed no enteric organisms, but blood-culture gave pure growth of *S. typhi*, subsequently identified as of the phage type recovered from cases in her home town. This positive blood-culture was confirmed by a second culture next day. White-cell count 3300 per c.mm. Marris's test gave a pulse increase of 16 per min.

Course of Illness.—The patient's condition developed along the usual lines of early typhoid, with typical decubitus, and signs in the mouth, tongue, abdomen, and chest. Four days after admission her temperature reached 104·8°F and there was increasing stupor. She was put on a five-day course of intramuscular penicillin and sulphathiazole by mouth. In this course she had 10,000,000 units of penicillin and 42 grammes of sulphathiazole without any arrest of symptoms or signs. On the 8th day of illness, in the middle of this course, she developed a typical typhoid rash, and her spleen became palpable. After an interval of three days the course of penicillin and sulphathiazole was repeated in the same dosage—i.e., 250,000 units of penicillin and 1 g. of sulphathiazole three-hourly for five days. Thus by the 19th day of illness she had had two five-day courses, totalling 20,000,000 units of penicillin and 82 g. of sulphathiazole. Nevertheless there was no diminution in the severity of symptoms or signs. Toxæmia and prostration were well marked, with incontinence of urine and fæces, and deafness and typical typhoid delirium were pronounced. The temperature remained between 102 and 104°F, with pulse-rate 120, blood-pressure 108/66 mm. Hg, and respirations 28 per min.

The stools, thrice previously negative, grew *S. typhi* on the 29th day of illness and remained positive thereafter. The Widal test by the 10th day of illness showed agglutination to *S. typhi* 1/50, flagellar and somatic. By the 37th day the titre

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for *S. typhi* was 1/500 and there was no agglutination of *S. paratyphi* or of *Brucella abortus*.

An abscess developed deep in her left thigh from a hæmatoma round the site of penicillin injection, and pus aspirated on the 37th day gave a pure growth of *S. typhi*. This abscess made it difficult to be certain of the condition of the left femoral vessels, and there was a suspicion at this time of thrombophlebitis. The abdomen always seemed well under control, and distension was never a prominent feature. Diarrhœa was at its worst during the third and fourth weeks; thereafter motions were approaching normal in appearance and frequency. There was no remission in the septicæmia. A blood-culture taken on the morning of her 43rd day of illness gave a growth of *S. typhi*.

In the evening of the 43rd day she had a sudden onset of acute abdominal pain without vomiting. She quickly became collapsed. Temperature fell from 103 to 101°F; pulse-rate was 156, and blood-pressure 90/50. Both iliac fossæ were acutely tender but there was no rigidity, no loss of liver dullness, no alteration in chest signs, and nothing abnormal in the alkaline urine. A perforation appeared unlikely, and mesenteric thrombosis was tentatively diagnosed.

Operation.—Laparotomy was performed within three hours of the onset of these symptoms, under ether and gas-oxygen anæsthesia. A right gridiron incision revealed much free serous peritoneal fluid, definitely not intestinal contents. No free gas; cæcum grossly distended. Through this incision only the terminal 12 in. of ileum could be inspected; it was much injected and showed numbers of adhesions to itself and the ascending colon, with areas of peritoneal reaction over typhoid ulcers. A firm peritoneal band between the ileum and ascending colon, which was obstructing the cæcum and terminal small intestine, was divided.

A midline subumbilical incision disclosed a further loop of acutely obstructed ileum produced by a firm peritoneal band running from the antimesenteric border of the ileum to the pelvic colon. This band was divided, but several small omental-ileal adhesions were left untouched. Inspection of the ileum showed no sign of perforation, though there was much evidence of active ulceration. The abdomen was closed without drainage after liberal dusting with sulphonamide powder.

Postoperative Course.—The first twenty-four hours after operation were very difficult, as was to be expected, but then there seemed promise of improvement. The abdominal condition settled quickly, and good motions were voided daily from the 45th day. The chest condition became acute, but in spite of this there was an improvement in consciousness. The patient was given 200 ml. of typhoid serum by intramuscular injection at this stage. Intramuscular penicillin 400,000 units three-hourly and sulphathiazole 1 g. three-hourly by mouth were resumed and continued until death took place quickly from circulatory failure on the 48th day of disease.

DISCUSSION

This case appears unique in its early admission to hospital as typhoid. Admission was decided largely on the history of the patient having drunk milk from a contaminated supply and on symptoms suggesting early infection. The subsequent course of the illness suggests that little benefit had resulted from the T.A.B. inoculation; the clinical picture was that of an unmodified attack.

There was keen disappointment with the response to combined penicillin and sulphathiazole therapy after the decidedly promising results recorded by McSweeney (1946). It is possible that the dosage of penicillin used in this case in the early stages was insufficient; previously Prof. J. W. Bigger (1946) recommended 3,000,000 units a day, but in a personal communication he suggests a dosage of 4,000,000 units daily. Cases from the same source as this patient gave good results on this therapy elsewhere.

With the lowered incidence of enteric infection rare complications are unlikely to be found in modern literature.

Osler and Cole (1902) and Keen (1898) do not mention acute intestinal obstruction in the course of typhoid. Rolleston and Ronaldson (1940) mention non-perforative peritonitis, and Goodall (1928) describes a similar condition with formed apparently by stretching of adhesions due to p of lymph. Curtillet (1939) records a case of perforation at the 17th day of an attack of typhoid in a boy of 7 years, where a loop of terminal ileum was obstructed by its firm fixation in the pelvis, and recovery followed ileostomy and subsequent repair of the fistula.

A more impressive case is that of Alglave (1939) in a female patient of 25 years with an acute onset of abdominal symptoms at the 28th day of typhoid. There was acute crampy abdominal pain with vomiting, and increasing distension. Visible peristalsis was produced on palpation and there was no point of maximum tenderness. Laparotomy two days later disclosed a newly formed peritoneal band between the loop of bowel and the pelvic wall, snaring the ileum and causing the acute obstruction. Division of this band relieved the condition and recovery thereafter was uneventful.

SUMMARY

A case is recorded of acute intestinal obstruction arising in the course of protracted typhoid fever.

The multiple obstruction was caused by peritoneal bands, probably due to stretching of adhesions formed over areas of typhoid ulceration. Division of the bands relieved the abdominal symptoms, but death followed from typhoid septicæmia.

Therapy with penicillin and sulphathiazole was disappointing, but insufficient dosage may explain this.

The patient had a record of T.A.B. inoculation about 27 months before the onset of symptoms, but the course of the illness was severe and unmodified.

I am indebted to Dr. G. F. W. Tinsdale for the bacteriology of the case, and Mr. H. P. Hall for the surgical treatment.

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SYRINGOMYELIA TEMPORARILY RELIEVED AFTER SCALENOTOMY

John M. Potter
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In the following case of syringomyelia a temporary remission of symptoms followed scalenotomy.

An Anglo-Indian woman, aged 23, had noted four and a half years earlier that while playing the piano her left little finger felt weak. Shortly afterwards she could not straighten it. Six months later the ring finger became similarly affected, and a month after this she began to have a dull tingling ache down the medial aspect of her left arm, passing behind the elbow and down the inner border of the forearm as far as the wrist. The pain was intermittent and not severe, but was aggravated by carrying heavy things or any undue exercise of the arm; it was not aggravated by coughing or sneezing. After a further eight months her attention was drawn t wasting of the left hypothenar muscles. Massage, radia heat, and splinting, had no permanent effect on her disabil and two years after its onset, radiography showing no eviden of a cervical rib, scalenus anticus syndrome was diagnos and a left scalenotomy was performed. (There is no reco of any objective sensory or vascular abnormality in the affected limb at that time, nor has the patient ever noticed any such symptoms apart from the pain.) After this operat all her symptoms were entirely relieved, but the w remained.

Two years and four months later she knocked her shoulder against a cupboard. This produced a similar p which persisted, becoming a little more severe. Two after this injury her left hand became suddenly "cramped while knitting, and afterwards she noticed that her ingers were weak and bent as before; they remained in that condition. Shortly after the injury to her shoulder, whenever he jumped down from a vehicle, landing suddenly on her feet, he felt in her left shoulder blade a jarring pain which, though sharp at first, gradually wore off.

Her general health was good and there were no other symptoms. She had never had any serious illness or injury, and no eye trouble.

I found her an intelligent and genuine person. She gave a lucid unexaggerated history, and was extremely coöperative during examination. She was small, but well-built and looked healthy. There was no deformity or tenderness of the spine. Neck movements were full and painless. The radial pulses were equally palpable and there was no significant variation during neck rotation or shoulder bracing. The movements at both shoulders, elbows, and legs were strong, and the tone was normal in the muscles. The left hypothenar and the medial part of the thenar eminence were flattened, and fasciculation was observed there at intervals. It appeared to be a little increased after the injection of 1 ml. of 'Prostigmin.' There was some weakness of all the left hypothenar muscles, the interossei (notably the medial two), the medial two slips of flexor digitorum profundus, and possibly flexor carpi ulnaris. Froment's thumb sign was positive. In the right hand there was a suggestion of early wasting of the adductor pollicis brevis, but no detectable weakness or fasciculation was observed, and Froment's sign was negative.

Sensory examination revealed dissociated anæsthesia, segmental in distribution but affecting the right side more than the left. On the right, in C8 and T1 segmental areas, there was incomplete appreciation of pinprick and temperature. To a lesser extent pinprick felt dull in T2–T4 segmental areas; and in C4–C7 it was not felt with the same intensity as in C3. On the left, in C8 and T1 segmental areas, pinprick and temperature were similarly affected, but rather less than in the corresponding segments on the right. Here again C3 seemed to be the lower limit of acute sensation to pinprick. Cotton-wool sensation, joint-position sense, and two-point discrimination were everywhere normal, but vibration sense was a little impaired everywhere on the right side below the clavicle. No trophic changes, burns, or scars were seen except the left supraclavicular operation scar. There were no sensory changes in the face.

The right radial reflex was inverted: finger flexion only. The left radial reflex was brisk, with finger flexion. The right biceps reflex was absent; and the left was brisk. The right triceps reflex was normal and the left was absent. Abdominal, knee, and ankle reflexes were normal and equal. The plantar responses were both flexor. Sweating was nduced, and was greater on the left side of the face and forehead than on the right; the upper limbs were affected equally. The pupils and palpebral fissures were equal, and there was no nystagmus. The fundi and cranial nerves were normal. No cutaneous neurofibromata were present.

The blood-count was normal; Hb 84% (Sahli). Blood Wassermann and Kahn reactions were negative.

Lumbar puncture produced clear colourless fluid, rising to a height of 160 mm. There was a brisk rise and fall of 100 mm. on bilateral jugular compression. The cerebrospinal fluid contained 15 mg. of protein per 100 ml.; no cells were present and the Wassermann reaction was negative in the fluid.

Radiography of cervicodorsal spine showed no abnormality, and screening showed good movement of the diaphragm on both sides.

On this evidence there could be little doubt about the diagnosis of syringomyelia.

DISCUSSION

Swank and Simeone (1944) have described a superior, or upper, and an inferior, or lower, type of the scalenus anticus syndrome. In their series of 17 cases, 9 were upper and 8 lower. In the upper it is primarily C6 and C7 nerve-roots that are compressed, and in the lower C8 and T1. The syndrome may be bilateral, and the two types may be combined. These writers believe that the scalenus anticus muscle is the main compressing force, and they noted at operation several factors which they consider important in producing this compression. These were physiological hypertrophy of the muscle and various anatomical abnormalities. Respiratory overactivity and "myositis" were also considered. Ochsner et al. (1935) have cited spasm, as a result of trauma or irritation, as a factor; and Naffziger and Grant (1938) refer to embryological, anatomical, developmental, and occupational mechanisms.

If all these factors are at work, it is reasonable to believe that many people suffer minor degrees of root compression by the scalenus anticus muscle, and that for each person showing the syndrome there may be several in whom this compression is insufficient to produce any obvious interruption of conduction in the nerves.

If a nerve-trunk is compressed at two points along its length, the effect on function, if any, will be a result of the combination of these two forces. Neither of the forces alone may be sufficient to produce symptoms, but together they may do so. In the present case the scalenus anticus may have been an insignificant compressing force until the intramedullary cord lesion higher up started to cause effective pressure on the anterior horn cells of the nerves affected also lower down. If the lower compressing force were removed, as by scalenotomy in this case, one might expect the symptoms to clear until more anterior horn cells were compressed. In this case the symptoms came on again after trauma, which possibly caused a slight hæmatomyelia. It was a chance happening that the cord segments affected were those giving birth to roots liable to scalenus compression (in this case C8 and T1), but presumably it has happened before and will again. In such a case, where the cord lesion cannot be extirpated, I suggest that the relatively minor operation of scalenotomy might provide dramatic, if only temporary, relief from symptoms.

SUMMARY

A case of syringomyelia is described in which the symptoms were relieved for two years and four months by scalenotomy.

An explanation is offered for this result.

Scalenotomy may prove a useful palliative measure in chronic incurable disease affecting any of those segments of the spinal cord which give rise to nerve-roots liable to compression by the scalenus anticus muscle. These roots are C6–8 and T1.

I wish to thank Sir Hugh Cairns for his help in the preparation of this paper.

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"... The Royal College of Obstetricians and Gynæcologists has from time to time stated its views on the maternity services to be provided under the National Health Service Act ... We reiterate our conviction that the care of the pregnant woman, whether at home, at the clinic or in hospital, is a responsibility which cannot be discharged with the maximum safety to the two lives at stake if it is shared between different administrative bodies. The importance of full coordination in reducing maternal and infant mortality is so great that the duty of providing a coordinated scheme for *all* aspects of maternity work must be placed unequivocally on one authority at regional board level. ... The college has always advocated that it is desirable to have a list of practitioners who have had experience of midwifery after qualification to be called in for midwives' emergencies under the Act. ... It appears now that any practitioner can undertake maternity work under the Act. He may not necessarily be present at the confinement but will be called upon in an emergency. The principle which the college has always recommended will be discarded if such a practitioner does not possess the experience mentioned above."—Sir WILLIAM GILLIATT, F.R.C.O.G., *Times*, July 9.

Reviews of Books

Anatomy

A. David Le Vay, m.s., f.r.c.s. London: Hodder & Stoughton for the English Universities Press. 1948. Pp. 209. 4*s.* 6*d.*

Mr. Le Vay has provided "as many illustrations as a book of this size will carry," and very good they are. Anatomy, like murder, is not easily brought home in the absence of a body, but this little book does wonders in the way of clear exposition. The general reader, for whom it is primarily designed, may perhaps find himself struggling fly-like in the webs of anatomical terminology, but the nurses and physiotherapists, and even the medical students, to whom it is also commended, will think themselves well treated.

Cineplasty

Henry H. Kessler, m.d., ph.d., formerly chief of amputation center, U.S.N. Hospital, Mare Island, California. Oxford: Blackwell Scientific Publications. 1947. Pp. 201. 35*s.*

The subject of cineplasty is arousing new interest in many countries where efforts are being made to improve the fitment and use of specially designed—and it is claimed more useful—arm prostheses. In this book the history of cinematised arm stumps is ably told and illustrated from the time of the earliest experiments of Riccard in France (1891) and Vanghetti in Florence (1898); and this section, with an account of the functional use and development of the upper extremity, makes an excellent introduction to the subject. The main purpose is to discuss the physiology and detailed anatomy of the arm in relation to the surgery of cineplastic operations. Illustrations of the cineplastic prosthesis suggest that it is unduly complicated and heavy when worn on the various types of cinematised stumps. If cineplasty is to be developed and used, appropriate types of prosthesis must be studied and developed. Nearly all the prostheses are shown with a form of mechanical hand, doubtless chosen for cosmetic reasons. The hand might well be detachable, to permit the attachment of the types of appliance used with ordinary artificial arms. Workers, and those with a hobby in which tools are used, need a few appliances to grasp the tools. These should be quickly and easily interchangeable with the hand. Reablement is given proper emphasis. If a patient knows there is a sphere in which his reduced capabilities can be economically employed it helps not only him but all concerned with his surgery, convalescence, fitment of limbs, and restoration to social life and work. The book is rather over-illustrated, explanatory notes and references being rather too short. The reader would be assisted if photographs were related more exactly in their context.

The Secret Instrument

Dr. Walter Radcliffe, with an introduction by Wilfred Shaw, m.d. London: Heinemann Medical Books. 1947. Pp. 69. 10*s.* 6*d.*

This little book recalls the primitive condition of the practice of midwifery in this country almost to the 18th century. It lay almost entirely in the hands of a number of ignorant women, and the few doctors who did practise it as part of their profession were almost as ignorant and unskilled. Midwifery was frowned on by the physicians of the day and was relegated to the barber surgeons. In the 16th century that great and humane French surgeon, Ambroise Paré, did what he could by establishing a training school for midwives in Paris, but the dangers of difficult labour were by no means overcome. There is indeed a strange irony in the fact that the most wonderful event in human existence—the birth of another life—should be so treated. As Dr. Radcliffe shows, the advent of the Chamberlen family in this country prepared the way for a more scientific approach in midwifery. The disclosure in 1813 of the hidden instruments of Peter Chamberlen revealed how far he had progressed in the evolution of the obstetric forceps now in general use. Before his time, infant mortality was very high and in the difficult cases in which cæsarean section was attempted the maternal mortality was also alarmingly high. Hugh Chamberlen carried on the tradition and indeed showed his belief in his own practice by bringing into the world 18 children of his own. It was not until 1877, however, that Professor Tarnier, of Paris, introduced his axis-traction forceps. This, and the recognition of the pelvic curve, finally led to the obstetric forceps of today. Incidentally the author gives us many interesting side-lights on domestic life in high places in this country during the Stuart period. Dr. Radcliffe does well to emphasise how much we owe to the Chamberlen family.

Médecine de l'aviation

Bases physiologiques et physio-pathologiques. J. Malmejac, professeur de physiologie à la Faculté de Médecine d'Alger, directeur du laboratoire d'études médico-physiologiques de l'Armée de l'Air en Afrique du Nord. Paris: Masson. 1948. Pp. 333. Fr. 12,000.

This synopsis of the work which has been published to date on the physiological aspects of flying will be chiefly of value to the English reader for its very extensive bibliography divided into sections on the basis of subjects and running into nearly 50 pages. Unfortunately much of the more important work in aviation medicine has not yet been published by the Government departments concerned, and Professor Malmejac clearly has not had access to some of the Service reports which have already appeared in English; but the monograph can be recommended to serious students of aviation medicine.

The Organisation and Management *of Hospital* **Stores** (*London:* Faber & Faber. 1948. *Pp.* 105. 15*s.*).—Hospital stores are too often scattered about all over the place, and some harassed stewards, mainly trying to put all their quarts into the pint pots available, may well be grateful for the many practical suggestions contained in this little book, from the authoritative pen of Captain J. E. Stone, the consultant on hospital finance to King Edward's Hospital Fund for London. Captain Stone covers a subject to which increasing attention will be paid in the future administration of hospitals. He steers a skilful course between red tape and extravagance, and hospital management committees and their executives have again cause to thank him.

***Alsos*: *the Failure in German* Science** (London: Sigma Books. 1948. Pp. 258. 15*s.*).—Prof. Samuel Goudsmit here describes the failure of German scientific effort to utilise nuclear physics. A history of a U.S. mission to investigate any possible German "atomic bomb secrets," the book is mainly concerned with the theme that the Germans failed not because of lack of government support but rather in spite of it, the entire blame being laid on German egotism and the Teutonic system of seniority that stifles at birth the ideas of any young genius. Two chapters about "Science and the Gestapo" are irrelevant to the argument. The final chapter, however, is an appeal to the public not to hamper research by allowing useless restrictions to be imposed in a field about which they know nothing; and this plea for a return to internationalism in science is perhaps the only thing that could justify the publication of *Alsos*.

Essentials of Fevers (2nd ed. Edinburgh: E & S *Livingstone. 1948. Pp. 351. 15s.*).—*This little book* has grown appreciably in its second appearance, but it may still be fairly described as a pocket edition. It covers a most surprising range with four concise introductory chapters and a terminal catalogue of some common mistakes in the diagnosis of fevers. Dr. Gerald E. Breen's attempt to compress the essential facts about at least 21 separate communicable diseases into the intervening 246 pages has resulted in a digest which will meet the present examination requirements of the medical student but is perhaps less likely to elevate the study of fevers from the lowly position among the clinical sciences about which he so rightly complains. This condensation also limits the value of the book for the young practitioner. Since the teaching of fevers is nowadays being given additional space in the student's curriculum, it cannot unreservedly be recommended as a standard book, particularly as it contains no single reference to other works. But the racy eminently readable text will be liked by many students, and Dr. Breen's flair for illustration has given this edition 16 coloured drawings, most of which achieve a great deal more than elaborate and expensive photographic processes would have done.

THE LANCET

LONDON: SATURDAY, JULY 17, 1948

Appointments

In the National Health Service how will vacancies in hospital staffs be filled? This is a question of truly fundamental importance to the service, and the answer—though not, we hope, the whole answer—is given in regulations[1] now laid before Parliament.

Under the Act all appointments senior to that of registrar are to be made by the regional hospital board or (in teaching hospitals) by the board of governors. For each vacancy the board will constitute an advisory appointments committee with seven members chosen for the particular task. The committee set up by a regional board will include two members nominated by the management committee of the hospital which has the vacancy, and one or both of these must be doctors. Of the other five members at least four will be medical: two of them must belong to the specialty concerned (one of these coming from outside the board's area), and at least one will be appointed after consultation with the university associated with the board. The intention is that normally the committee shall consist of five professional and two lay members, and the board will itself select one of the seven as chairman. For filling a vacancy in the staff of a teaching hospital the committee constituted by the board of governors will have two members nominated by the university, and one or both of these must be doctors. Of the other five members at least four will be medical: two of them must belong to the specialty concerned (one of these coming from another teaching hospital), and at least one will be appointed after consultation with the hospital board of the region. When a vacancy occurs the board will advertise it in two or more professional journals circulating throughout the country: the advertisement will give information about the nature and duration of the appointment, the remuneration, and the closing date for applications, and will state that canvassing members of the board or committee disqualifies the candidate. The committee will then consider the applications (holding interviews if it thinks fit) and submit to the board a list of persons suitable for the appointment, in order of preference. If the board does not want to appoint any of the persons thus selected it must re-advertise the post. It cannot fill the vacancy in any other way.

Complex though this may sound, it is really quite simple: henceforward all senior medical appointments in all hospitals are to be open to all comers, and the selection will be made in each case by a small and specially nominated expert committee advising the regional board or the board of governors. Casting a bright light into potential holes and corners, the new procedure represents in fact a triumph for those reformers who have long been working to make hospital appointments depend more on merit and less on local influence or acquaintance. The efforts made over so many years to abolish "in-breeding" in the teaching schools gain further support, and an end is made of the parochial methods by which local authorities have too often filled medical posts. Nevertheless the benefit to be gained in general from the new arrangements should not blind us to their possible faults. In one respect, unfortunately, they may prove strikingly inferior to the best existing practice. If their effect is to take the selection of new members right out of the hands of the hospital staff, they may gravely damage the corporate spirit which ought to mean so much in a hospital—a spirit depending not least on free choice of colleagues.

The regulations, it is true, provide for presentation of the "local view"; for the appointments committee is to contain two representatives of the management committee of the hospital in question. But if the medical staff of the hospital do not see the applications or the candidates, how can they form the view that is to be presented? Up to July 4 it was customary in many voluntary hospitals to ask every candidate for an appointment to call privately on every member of the staff, or of a large appointments committee; and though this was a laborious process, for all parties, it was evidence of the importance that some of the most experienced hospitals attach to personal relations. One does not, and should not, lightly choose associates with whom one will have to work for twenty or thirty years, and this is the reason why so many medical committees have taken this part of their duty so seriously and have often been content to devote several hours to the discussion of a single appointment. It is to be feared that, in practice, the new appointments committees advising the boards will not be able to give quite so much time to this work, and this makes it all the more desirable that the hospital staff concerned should have a share in the decision. If they do not bear part of the responsibility they will less cheerfully bear the brunt of mistakes. With any method errors are inevitable, but some of the more painful clashes of personality could certainly be avoided if the medical staff were given an opportunity to see the candidates who have been short-listed by the appointments committee. The committee would do the main work of selection, for which it has the best qualifications; but the medical staff would have a chance, if they thought fit, to explain to the committee—and if necessary to the board—that their own order of preference would, for personal or other stated reasons, be different. Some such arrangements can and should be made within the framework of the new regulations. If, for the sake of administrative simplicity, the boards do not take the trouble to make them, we hope that this inconspicuous but major issue will be raised by the Central Health Services Council in its early neonatal period. One of the ever-present dangers of the service is that too much of value may be sacrificed to mere convenience.

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[1] National Health Service (Appointment of Specialists) Regulations, 1948. Statutory Instruments, 1948, no. 1416. H.M. Stationery Office. 1d.

Tendon Reconstruction in the Hand

"HERE is something wrong. Excise it!" So runs one of the earliest principles of surgery, and in the development of this attitude the surgery of excision has attained a high level of competence and safety. The stage is now being reached beyond which subtraction from the human frame ceases to be profitable. "We think too much," said Sir JAMES WALTON recently, "of the preservation of life, without considering the quality of the life that is preserved." An encouraging trend of surgery is towards operations that modify function or restore a function that is absent or has been lost. The hand has long remained outside the surgeon's serious interest; and this is not surprising, for the results of intervention have mostly been disappointing. It is strange, nevertheless, that the primary importance of the hand to the patient has not been insisted on, and that the attitude of mind still prevails which will provide an immediate hospital bed and senior surgical attention for an elderly patient with an advanced carcinoma yet requires a young working man with an injury to the hand to be treated by the newly qualified in the casualty department. Such an attitude is no longer permissible, for the results of reconstructive surgery in the hand are now among the most beneficent in surgery. This advance is largely due to two causes—an improved knowledge of the reactions of tissues to injury, and perfections in technique. The atraumatic methods of the plastic surgeon and neurosurgeon are of great value in hand surgery, and it is largely the advances in these two specialties during the last thirty years that have made reconstructive surgery of the hand practicable and effective. Among those who have shared in this advance are CUSHING, JEFFERSON, and GILLIES and his colleagues BLAIR and BROWN, but it is to BUNNELL that we look as the pioneer of the atraumatic method in the hand. By his practice and teaching BUNNELL has shown the surgical world that loss of skin, nerve, tendon, or tendon-sheath in the hand can be repaired and a reconstruction achieved restoring movement and sensibility to man's most important working instrument.

At King's College, Newcastle-upon-Tyne, on June 25, Mr. GUY PULVERTAFT, himself a leading exponent of modern hand surgery, explained the conditions that govern successful tendon reconstruction in the digits, palm, and wrist. He urged the importance of primary wound closure so as to reduce scar-tissue to a minimum; the necessity for early tendon repair, whether at the first operation, as in the palm or at the wrist, or as soon as the wound is united, as in the finger; the need to select the correct procedure for each repair, PULVERTAFT preferring to use a tendon graft to replace a tendon injured in the thecal canal and to suture tendons divided more proximally; the significance of early nerve regeneration in the restoration of function to an injured digit; and the necessity for an exact, atraumatic, and specialist technique. The conditions that make primary tendon reconstruction inadvisable include inadequate operation conditions, crushing of the tissues, and wounds heavily contaminated or with much skin loss or some days old. The operation technique is the basis of success, but as soon as the wound is united active movements are essential, assisted by every art and force of character of the surgeon and physiotherapist. If the tendon unites but movement remains restricted, the tendon may be freed from its adhesions at a later operation and full movement still regained. The results of these procedures are most satisfactory. Full or almost full restoration of movement is the rule when reconstruction is done under ideal conditions by a specialist team.

For the present this work will inevitably develop in surgical centres where the conditions for operation and postoperative arrangements are suitably organised, and where the surgical team has the necessary qualifications for the job. These include an aptitude for minute and scrupulous technique and a sound training in general surgery with extra experience in plastic, nerve, and orthopædic surgery. Such a training and special experience are necessary for any surgeon who aspires to be a master of his craft, and it is better for the surgeon to combine these experiences in himself than that they should be divided between the several members of a team. In the United States hand surgery is now an accepted specialty, to which impetus will be given by the recent formation of the American Society of Surgeons of the Hand. It is unlikely that such a confinement of interest will gain favour in this country. The value to hand surgery of a wide experience in the principles from which it derives is not less than the value of the refinements of hand surgery to general surgical practice. Many surgical units, including several of the new professorial units, have concerned themselves with the problems of the hand as part of their more general work. In every area there should be at least one unit developing the facilities and techniques necessary for reconstructive hand surgery, and ready to disseminate its knowledge and example throughout the area. Only in this way will hands receive everywhere the surgical attention that their importance demands.

The Games

IT is safe to predict that the London Olympic Games will see a large number of previous records broken; for several of the athletes competing have already recorded times or distances better than the 1936 figures, and in any case Olympic performances have improved at every meeting since 1896. Of the 22 major track, field, and swimming events, 16 of the present records were set up in 1936, and the remaining 6 in 1932. The reasons for this trend are both biological and sociological. There have been improvements in the conditions the athlete competes under, in athletic technique, in the population sampling of each country, and perhaps in the general or average physique throughout the world. Of these for better technique and better sampling must have had most effect. Weather conditions vary from one Games to another, and the excellence of the Berlin track cannot have accounted for more than a fraction of the new records made there, though a downright poor track can seriously slow a runner.

It is only in the last twenty years that athletic technique has become stabilised, particularly in the field events, and it still improves steadily or (as in swimming) by spectacular steps. The most phenomenal improvements in performance have been in events where technique is of greatest importance;

uch as the hurdles, the high-jump, and the throws. Athletes now use all the apparatus of slow-motion inematography and time and motion study to control heir style, and the track and field events are settling lown into an applied science of human movement, where a painstaking approach to an ideal will replace ntuitive discovery. After one or two more Olympic Games, however, we may have to rely for new records chiefly on the other sources of improvement How can we find our superman, and how can we improve the whole population so that our athletic genius also reaches new heights? It was the express intention of Baron DE COMBERTIN, the founder of the modern Games, that they should stimulate the spread of athletics through the population of all countries, and this they have done. There remain vast differences in the efficiency of selection from one country to another. Leaving aside the question of professionalism, which only affects directly some of the minor events, class customs still have a strong restraining influence and are seen in their most anachronistic form in the Pentathlon and other purely military events in the Games themselves. The British track and field team has in the past been drawn mostly from the public schools and the Achilles Athletic Club, because outside these the tracks were few and coaches and tradition lacking The situation is changing slowly, as the tradition of separate class activities fades and physical education becomes recognised as a subject worth studying and worth teaching. Selection is most efficient in some parts of the United States, where physical education is an important item in the curriculum of the ordinary school, and where the universities sometimes provide scholarships for students more suited to this type of instruction than to any other. This, rather than the absolute size of the population, largely explains the supremacy of the United States in most events.

But there is another respect in which America is favourably placed. A considerable proportion of American successes have been due to Negro athletes, and in view of the limited opportunities of this group to take part in athletics, there is a widespread feeling that they are, either on the average or in the extreme, superior to the white man in athletic skill. This superiority clearly resides in some aspect of physique. It has been said,[1] for example, that the coloured sprinter under stress shows less tendency than the white to bend outward at the knee, presumably because of a difference in the knee-joint formation or the whole leg leverage system. None of the suggested reasons are very convincing. Some work has been done on the subject,[2] and groups of Olympic athletes have been measured, but nothing very systematic has yet emerged. In general one would expect a sprinter to have powerful legs and a light body, or, in the more precise terminology of SHELDON, a mesomorphic increase in the leg region over that of the rest of the body. Any race requiring not the rapid anaerobic breakdown of large quantities of glycogen but the continuous utilisation of large quantities of oxygen by the muscles calls for a highly efficient cardiovascular system, and in particular highly vascularised muscles. During the brief period of relaxation in the runner's stride enough oxygen must reach the muscles to supply his needs for the ensuing muscular contraction. This type of efficiency perhaps depends on the androgyny or masculine-feminine component of body-build. It is known that the lactic-acid production of women is greater, and hence the concurrent utilisation of oxygen less, than that of men doing an equivalent amount of moderate work; that the performance times of men with high androgyny are worse than those with low; and that androgens have an effect both on skeletal muscle and on the cardiovascular system. To suggest that Negro athletes have a lower femininity component than whites is to go beyond present evidence and to oversimplify the situation, since other athletic feats than running remain to be explained; but the whole subject would well repay further study by the improved means now available.

As for the last of our hypothetical reasons for improvement, in the last fifty years the growth process has been speeded up all over the world, so that adult height and weight are reached earlier than previously; and it is highly probable that adult size has really increased. Both are believed primarily to be nutritional effects, with perhaps further help from the breaking down of genetic isolates. But whether there has been a trend towards increasing muscularity, or towards decreasing androgeny, or in any other direction, is as yet unknown. Meanwhile, putting speculation and explanation behind us, we look forward to a previously unmatched exhibition of grace, skill, and strength.

King Edward's Fund

IN the past King Edward's Hospital Fund for London has perhaps been best known for its grants towards maintenance costs and capital expenditure; and some may ask how its assets, running into several million pounds, are now to be used. The answer was given last week by the Duke of Gloucester, presiding at the annual meeting of the general council at St. James's Palace. He pictured the new functions of this body as those less of a fund than a foundation, on the lines of the Rockefeller Foundation. Nevertheless, the new health service has not relieved the Fund of all maintenance costs; 117 convalescent homes, with 5212 beds, which have not been transferred under the Act still look to the Fund for support. In other fields the groundwork is already laid, covering aspects of the hospital services which will possibly always be best dealt with by an extragovernmental body. For example, through propaganda and the offer of training bursaries, the Fund is trying to raise the standard of hospital administration, catering, and domestic supervision; it is actively helping in nursing recruitment; and it is financing travel grants for the betterment of several departments of hospital life, including actual construction. Perhaps the activity most familiar to London's doctors is the Emergency Bed Service, now enlarged to serve all four metropolitan hospital regions. Last year the service made a survey of all mechanical respirators in the voluntary hospitals of Southern England; and the value of this precaution was proved in August when each of the many urgent calls was met. Less successful, through shortage of supplies, were the efforts to obtain streptomycin treatment for cases of tuberculosis meningitis and miliary tuberculosis. "The situation," says the annual report, "reached its worst in April, 1948, when 45 people were waiting for treatment with little or no prospect of obtaining it." Since then, however, it has improved.

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1. Webster, F. A. M. Science of Athletics.
2. See T. K. Cureton, Physical Fitness Guidance and Appraisal. London, 1947.

Annotations

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THE incidence of tuberculosis in children is low, but it has increased with the failure of the provisions for adult treatment. A report of the Joint Tuberculosis Council[1] has focused attention on sources of infection outside the home. Examples are quoted of the risk to infants and school-children from tuberculous persons whose duties bring them into close contact with the children. We report elsewhere a reply given by the Minister of Education to a Parliamentary question on tuberculous teachers. Education authorities have been reminded of the action to be taken when a teacher is found to be suffering from active tuberculosis, but no provision is made for the examination of teachers at regular intervals after entry into the teaching service, nor is sufficient importance attached to radiography as an essential aid to diagnosis. The examples quoted by the Joint Tuberculosis Council of infection and mortality among young inmates of children's homes and schools are appalling. Recently two further instances have occurred in a Greater London area. A young Irish girl, teaching in a private school, was found to have phthisis. She had reported her initial symptoms to a doctor in Eire, but the significance of her story was missed and she continued to teach, in England, for a further three months before she was referred to a chest clinic. In the second case a woman working in a day-nursery was found to have well-marked apical excavation. She was obviously capable of transmitting a virulent infection, and the amount and nature of morbidity among the children in the nursery is now being investigated. Such incidents can and must be prevented. For this purpose the following recommendations are made by the Joint Tuberculosis Council:

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An unusually high incidence of pulmonary or non-pulmonary tuberculosis in any organised group of children, says the report, should lead at once to a full investigation of the staff employed. The fact that attendance at school is compulsory, and that many children are placed in homes or nurseries at the behest of some public authority, makes it a public responsibility to take the steps that are patently necessary to prevent tuberculous infection in these places. Dr. Wilfrid Sheldon and the children's committee of the Joint Tuberculosis Council will have their colleagues' full support in their efforts to abolish a grave and needless risk.

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TREATMENT OF NASAL INFECTIONS

ONE of the most valuable advances in the field of otolaryngology during the past 15–20 years has been the elucidation of nasal physiology. The schneiderian membrane, or respiratory mucous membrane, is a pseudostratified ciliated epithelium. The mucus it secretes forms a continuous if tenuous sheet throughout the nasal cavities and accessory sinuses. The cilia are embedded in this sheet of mucus, and their whip-like movements act concertedly in moving the sheet bodily in specific directions. In each sinus the cilia shift the mucus to the ostium and into the nasal cavities, whence it is gradually moved into the nasopharynx. When sufficient mucus accumulates here it initiates a movement of deglutition and is swallowed. Solid or droplet particles in the respired air adhere to the mucus, which thus has a cleansing function, and, in addition, moistens and warms the air. Finally, at least one enzyme has been found in this nasal secretion which has an active antibacterial action, and there may be others with similar or complementary properties. Thus complex and important rôles are played by this unassuming hidden area of mucosa, and an appreciation of this physiology has led to a revision of ideas about nasal disease. For example, the patient who complains of a continual dripping of mucus ("catarrh") into the back of his throat can usually be reassured. But more important is the modern conception of infection and its treatment which has been based on the new knowledge of physiology. Nothing must be given or done which inhibits the normal functions of the mucous membrane—particularly ciliary activity—since these are the natural mechanism of resistance and drainage of the area. Besides the usual general measures of treatment of infections, mild vasoconstriction of the mucous membrane of the various sinus ostia is necessary to allow secretions to be evacuated in the normal way. The choice of drug and method of application have been extensively studied, notably by Dr. Arthur Proetz of St. Louis.

In a lecture at the Institute of Laryngology on June 28, Dr. Proetz demonstrated his suction-displacement method of treatment for acute and subacute nasal infections. It is possible to introduce fluid into an air-filled rigid-walled container through a small hole if the opening is covered with a layer of fluid and suction is applied. Air leaves the cavity and bubbles out through the overlying fluid, which enters and takes its place when the negative pressure is released. This hydrostatic principle is applied to the nasal sinuses by placing the head in such a position that the sinuses are lower than the nasal cavities. With the patient lying on his back with his head fully extended over the edge of the couch or table this can be achieved. Fluid is then introduced gradually through each nostril in turn until all the sinus ostia are submerged—various devices are used to ensure approximation of the soft palate to the posterior pharyngeal wall and thus prevent the fluid escaping into the pharynx. Each nostril in turn is closed by pinching, and while one is closed the tip of a sucker, connected to a source of intermittent suction of not more than 150 mm. Hg, is introduced into the other. Air can thus be evacuated to some extent from the most remote ethmoidal cell and replaced by fluid, provided the ostium of that cell is patent. The fluid used in treatment is a 0·25% solution of ephedrine in normal saline, and as this remains many hours in the sinus before being gradually expelled a continuous slight vasoconstrictive effect is exerted on the mucosa surrounding the ostium. This solution has been found, as a result of trial and error, to exert the optimum effect, since it has scarcely any action on the cilia, which function normally in its presence. The procedure is repeated in 48 hours and four or five treatments are needed in the average case. If the condition emains unchanged after eight or ten treatments, the nethod should be abandoned. Chronic infection is often elieved but rarely cured in this way, for irreversible hanges have usually occurred in the mucosa. As an id in diagnosis radio-opaque fluids may be introduced nto the sinuses and an appreciation formed of the hickness of the lining mucosa. The simplicity of the pproach was achieved only by clear thought and areful consideration of fundamental physiology, in the nderstanding of which Proetz and his associates have layed a pioneer part.

SURGICAL COMPLICATIONS OF TYPHOID FEVER

ABOUT the rarest surgical complication of typhoid ever is intestinal obstruction from band formation. Considering the nature of the pathological process, t is rather surprising that obstructive adhesions do not form more often. In the case reported by Dr. Kane n this issue there were two bands needing division, both of which compressed the small intestine. A sudden et of pain, a rise of pulse-rate with fall of tempera- e, and an absence of abdominal rigidity led to a gnosis of mesenteric thrombosis. An operation was ie within three hours of the onset of the crisis, but ugh the obstruction was relieved, the patient died the fifth postoperative day rather from the intensity the primary disease than directly as a result of the nplication.

n a monograph on surgical complications of typhoid er,[1] recently published in Germany, obstruction by nds is not even mentioned. But Detlefsen describes ier surgical happenings in detail, and his book is a ninder that such events should be borne in mind. not very prominently. The most common complica- n—perforation—occurs on average 1–5 times in every 0 cases. The perforation is not always in the expected ice—the lower 60 cm. of the ileum—for it is sometimes the appendix, cæcum, or any part of the colon including e sigmoid flexure, a fact to be remembered by the rgeon searching for the origin of a typhoid peritonitis. iere may be two perforations. Attacks of pain in the urse of typhoid are not uncommon. Diagnosis depends the suddenness and acuity of the attack, the collapse ith weak suddenly risen pulse-rate, the fall of tempera- ire, and the local tenderness and rigidity. A rectal amination reveals sensitiveness of the rectovesical ouch. A midline incision makes the search more easy. n rare cases the perforation is not of the bowel but f the gall-bladder. The symptoms may even arise from a ppurating mesenteric gland or exceptionally from the rganisms penetrating the peritoneal cavity without a erforation. After suturing a perforation it is advisable o drain the abdomen. The complication is very serious, or the death-rate even after operation is 92–93% and ithout operation all die.

The other complications needing surgical treatment nclude cholecystitis, appendicitis, and abscess of the pleen. In connexion with the problem of the typhoid arrier, Detlefsen insists that before removal of the ll-bladder is considered the patient should be treated r two years and it should be certain that the gall- adder is the offending organ. Foci in the appendix, nes, or kidneys should be carefully excluded. If this s been done and gall-stones are present, or if the wall the gall-bladder is obviously diseased, cholecystectomy n be counted on to give a permanent cure. How portant it is to deal with such carriers can be gathered om the statement that a single carrier was known to responsible for several hundred attacks of typhoid other people and ten deaths during his lifetime. one lesions due to typhoid call for early recognition and eatment. Their discharges are just as infective as those from the bowel—a fact apt to be forgotten. The spread of infection from them is very difficult to deal with in the surgical management of wounds and sinuses. It requires unremitting care and alertness combined with strict regard to the principles of aseptic wound technique.

CARCINOMA OF THE PANCREATIC HEAD

IN a lecture at the Royal College of Surgeons on July 8, Dr. R. B. Cattell discussed the lessons learnt from 56 pancreaticoduodenal excisions, for carcinoma of the pancreas or of the ampulla of Vater, performed at the Lahey Clinic. He reported no startling advance on the views which Whipple, Braunschweig, he, and others have already expressed in print,[1] but he dotted many i's and crossed some t's in his reflections on a series of cases which, for size, can have no rival in this country.

The diagnosis of operable pancreatic malignancy is largely clinical. The radiologist and pathologist can offer little help at the stage when these carcinomata can be resected. Jaundice is the common *presenting* symptom; it is also the *first* symptom of growths in the ampulla. In growths of the head of the pancreas proper, nausea and loss of weight usually precede the onset of jaundice, and, if the jaundice is long delayed, diagnosis may be extremely difficult. Deep boring pain in the upper lumbar region, relieved by change of posture, may suggest a pancreatic neoplasm, but laparotomy is often delayed till jaundice has appeared. This means that carcinomata of the body and tail of the pancreas (which are fortunately much less common than growths in the head) are seldom operated on until they are beyond excision. Most patients with pancreatic neoplasms are old, jaundiced, and in poor general health, and every possible method of improving their condition is needed if they are to survive radical excision. With this object in view Dr. Cattell recommends a two-stage operation for most patients, especially if they have been jaundiced for a long time. A loop of jejunum, with an entero-anastomosis across its base, is anastomosed to the gall-bladder as the first stage, and back-pressure on the liver is thus relieved. This measure does much more than all other forms of therapy put together for the patient's general condition. The jejunal loop, he claims, can easily be retracted to the right when, two or three weeks later, the second stage is done. The most important feature of the second stage is the anastomosis of Wirsung's duct to the jejunum. Total closure of the pancreatic stump by suture is not only a cause of fatalities by leakage of pancreatic juice into the peritoneum but is also a cause of failure, in those who survive, to gain weight after the operation. Another important point is the secure closure, by rows of sutures, of the proximal end of the common bile-duct, lest it leak bile into the peritoneum. The block excision of the pylorus, duodenum, head of pancreas (and the subsequent plumbing procedures to restore continuity to the gastro-intestinal, biliary, and pancreatic tracts) are an anatomical exercise which those who have done them know to be less childishly easy than Dr. Cattell's beautiful colour film would lead one to suppose.

The results of palliative cholecystjejunostomy at the Lahey Clinic for inoperable neoplasms are that 73% of the patients do not survive the operation by three months. Dr. Cattell has lately combined this operation with anastomosis of Wirsung's duct to the jejunum and has tied both pancreaticoduodenal arteries to decrease the vascular supply to the growth. It is not yet known whether this improves the depressing results of palliative surgery. By contrast, 43% of patients subjected to a radical resection live more than two years, 39% show signs of recurrence within two years, and 18% die in the postoperative period. Those who survive operation are restored to reasonable health. Sufficient time has not yet elapsed for a differentiation of prognosis of the

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Detlefsen, M. Die chirurgischen Komplikationen des Abdominaltyphus. Dresden, 1948.

[1] See leading article, *Lancet*, 1946, ii, 386.

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BRITISH MEDICAL ASSOCIATION

Scientific Sections

OCCUPATIONAL HEALTH

President : Dr. Donald Stewart

Human Relations in Industry

Approaching the subject "from the angle of a universalist rather than a specialist," Sir George Schuster emphasised the danger that the study of human relations may become merely a means to more production, rather than an end in itself. A threefold purpose in work is fundamental: there should be, first, excellence in production; second, a satisfactory foundation for a good life; and third, it should fit in with an established social culture. These three must be reconciled, and schemes which fail to do so will be both wrong and unsuccessful. To achieve satisfaction, workers must have confidence, and as this rests on coöperation there must be no conflict between work and social duty or social aspirations; practical difficulties exist that are often exaggerated. Solutions must be flexible and allow the individual scope. The medical officer's part consists in fitting the job to the man, and to do this he must be able to see the total picture. He should be one of the management team, and himself be available for high administrative office; he should take part in joint management committees and can contribute much to the appreciation of the individual as a human being. Industrial medical officers should form a group which can discuss current problems with the panel on human factors of the Cabinet committee on productivity, of which Sir George Schuster is chairman.

Dr. Elliot Jaques discussed the relation of morale to health and illness, and maintained that the success of medical practice in industry depends largely on the coöperation obtained by the medical officer. The behaviour of the leader determines the behaviour of the led, and the leader who inspires participation in the group produces the best results. The morale of the industrial medical officer is therefore essential in developing the morale and thus the health of the group.

In communicating ideas from one individual to another, the learner must participate in the formation of the idea. In applying this view to education in human relations, Dr. R. F. Tredgold contended that ideas must not be imposed, but there must be an atmosphere of friendliness and a gentle insistence on participation. People pay lip service to others' words; they act in accordance with others' behaviour. The pattern of relations in industry is based not on the religious and political views of the past twenty-five centuries but on the historical facts of the past one. Mr. J. F. Scott (Harvard) gave examples illustrating the need for sound material in the teaching. Words and behaviour should be regarded as symptoms of underlying emotions, and must not be taken only at their face value but as part of a total picture. If the feelings are straightened out the facts will take care of themselves.

Aviation Medicine as Applied to Civil Aviation

Air Marshal Sir Harold Whittingham included in his subject such widely diverse considerations as selection and care of all flying personnel and ground staff, with periodic tests of their health and efficiency, and the difficult decisions of retiring age, and the investigation of all aircraft accidents, however slight. He claimed that such accidents now average only 2 per hundred million passenger miles, 60% of them being in landing and taking off. It also covers the comfort and well-being of passengers, including seat design, safety belts, and oxygen appliances; the maintenance of safe water and food-supplies en route; the "disinsectation" of aircraft; and quarantine problems and the standardisation of vaccines and inoculation methods, which are best approached through the World Health Organisation.

Stratosphere Flying

This was defined by Wing-Commander W. P. Stewart as flying at 40,000 feet and over and (though conditions are not constant) at a temperature of 55°C and a pressure of 15 lb. to the square inch. At this height there are no cloud particles or moisture, the sun seems brighter—in fact, solar radiation is considerably greater—and the sky is dark purple. Stratosphere flying is a distinct possibility for passenger planes, particularly at night, and it has the advantages that air-sickness is non-existent and vibration much less. But before it can be achieved there must be great advances in aircraft design, to prevent failure of oxygen appliances which at these heights causes death from anoxia in 30–90 seconds, and to prevent vaporisation of the body fluids.

Fatigue in Flying

Sir Frederick Bartlett, F.R.S., divided fatigue into different types—e.g., of muscle only, of muscle plus brain, due to lack of sleep—and each kind has its own specific physiological and mental results. In flying the fatigue is of brain plus muscle and it includes all the demonstrable changes of activity due to the continued exercise of that activity under its normal range of conditions.

The air crew's activity consists in the continued interpretation of signals, received either from instruments or from other members of the crew, and their translation into planned action. This entails almost continuous readjustment and becomes largely automatic. Experiments by Carmichael and by Dearborn and in the "Cambridge cockpit" showed that in good conditions a healthy man can keep up this form of activity for six hours at least without ill effect. When deterioration does occur there are three diagnostic signs: (1) a bigger receptor change is needed to set off any effective response, so that ragged timing of operative movements results; (2) greater preoccupation with how the body works sets in and feelings of discomfort appear; and (3) the "anticipatory span" of action becomes restricted. Passenger fatigue still belongs to the realm of anecdote. Passengers probably suffer more from boredom than from actual fatigue, but the objective effects are much the same and there is room for much more investigation in this field.

SECTION OF PHARMACOLOGY

President: Prof. E. B. Verney, F.R.S.

Anti-histamine Substances

It is now nearly forty years since the dramatic pharmacological actions of histamine were first recorded. Recognition of the close similarity of its effects to the manifestations of anaphylactic shock was followed by observations of its action on the tone and permeability of capillaries, and its presence in normal cells, and of a histamine-like substance released in the skin in response to injury. Histamine has also been detected in the blood-stream during anaphylaxis. This was recalled by Sir Henry Dale, F.R.S., who went on to say that when histamine is released during allergic reactions it may act either on the cells releasing it or on others at a variable distance. Is there evidence of a difference between the effects of anti-histamine drugs on the reactions to "intrinsic" and "extrinsic" histamine? It is reasonable to expect that intrinsic histamine would produce its pharmacological effects with little, if any, ampullary growths and those of the head of the pancreas, but there can be little doubt that the ampullary neoplasms, because they attract early attention by causing jaundice, will be found to do better than growths in the pancreas proper.

GRIEF IN INFANCY

YOUNG delinquents, particularly those described as "affectionless," so often have a history of separation from the mother during their early years that a study has long been needed of infants who suffer this particular deprivation. Dr. René A. Spitz, who has been working on this subject in America, described his findings to the Royal Medico-Psychological Association on July 9, and showed a film. He has been able to watch large numbers of infants over long periods, in nurseries, private homes, foster homes, a foundling institution, and a maternity home, and in an Indian village. Children in a nursery where they normally are reared by their own mothers under supervision were particularly suitable for his purpose, since their behaviour could be compared with that of plenty of controls. He has seen nineteen children between the ages of 6 and 12 months whose mothers have been obliged for some reason to leave them for a time. The child learns nothing without the help of the mother during the first year of life: hearing, touch, taste, walking, orientation, thinking, will, and speech are all learned through her, and her ego, he said, is complementary to the immature ego of the child. The loss of the mother cannot therefore be compared with the bereavement of a grown-up person: the child loses its actual chance of developing. Dr. Spitz has analysed children's progress in perceptive, bodily, social, learning, manipulative, and intellectual development during the first year of life, and is able to calculate a developmental quotient (D.Q.). The assessment is made by analysis of films made of the children at play, a method which owes nothing to personal relations between child and observer.

He finds that the effects of separation from the mother in children aged 6–12 months fall into three stages. After the first month of separation, the child becomes tearful; his progress falls off in every way, though the social factor is increased relatively to the other factors since his desire for social contacts is increased. After the second month this picture changes; the child, who before the mother's departure was friendly and sociable, now takes to screaming at strangers and cannot be soothed by ordinary methods. Screaming bouts may last as long as three hours. He begins to lose weight, and the D.Q. is arrested. In the third month he gives up all attempts to crawl or walk, and adopts an attitude which Dr. Spitz describes as pathognomonic: he lies on his face and refuses all social contact. He loses more weight, sleeps badly, and becomes accident-prone and subject to intercurrent ailments. In the fourth month his face acquires a frozen-dazed look, his screaming and tearfulness are replaced by a whining moan, and his D.Q. sinks even lower. This stage, if unchecked by the return of the mother, may go on to marasmus. Dr. Spitz suspects that the turning-point is somewhere between the third and the fifth month: after that, separation from the mother leaves irreversible changes, whereas her return before this point produces cure within a period of from 12 hours to 14 days. The D.Q. leaps up again, and though it may go back a little later, it never regresses to the point it reaches during separation.

His film *Grief, a Peril of Childhood* shows children who illustrate all the stages he described. The change from a smiling confident baby to a forlorn and anxious one is very striking, and the attempt the child makes, in the first month of separation, to cling to any friendly person while continuing to weep disconsolately is a vivid expression of inner despair.

If the mother cannot return, or if she has died, the child must be given a substitute, and helped to accept her; and he will also need to be encouraged to crawl and walk again. It is interesting that these symptoms of deprivation are only seen when the relationship of mother and child is a good one: where the relationship is poor the child accepts his mother's departure with equanimity.

DIAGNOSIS OF MITRAL INCOMPETENCE

So much has been written about the insignificance of apical systolic murmurs that the practitioner may well have decided that the safest line is to ignore them. In fact—and this applies to most of the signs and symptoms of medicine—mistakes are likely to be made only when this murmur is considered as an isolated finding. It must be borne in mind (*a*) that an apical systolic murmur should never be the basis of a diagnosis or prognosis without reference to the other findings and to the patient's history, and (*b*) that mitral incompetence is not a rarity but the almost inevitable precursor of mitral stenosis.

These points are brought out in an American analysis[1] of 315 rheumatic children discharged over a period of fifteen years from a sanatorium for children with rheumatic heart disease. The children were divided into two groups according to their cardiac status on discharge: group I consisted of 171 cases with soft, poorly transmitted apical systolic murmurs and classified as having potential or possible rheumatic heart disease; group II consisted of 144 cases diagnosed as mitral insufficiency because of a loud blowing systolic murmur maximal at the apex and well transmitted to the axilla, even though there was no evidence of cardiac enlargement. The follow-up ranged from five to fifteen years, with an average of eight years. In group I, 22 patients (13%) developed definite cardiac lesions and there were no deaths; 16 had mitral stenosis, with or without mitral incompetence and aortic incompetence. In group II, on the other hand, 69 patients (48%) developed definite cardiac lesions and 20 died; 53 had mitral stenosis, with or without mitral incompetence and aortic incompetence. Of the children in group I, 53 (31%) had had multiple attacks of rheumatic fever before coming under observation, while 12 (7%) had recurrent attacks during the follow-up period. The comparable figures for group II were 92 (63%) and 28 (19%).

The conclusion drawn from these findings was that "the diagnosis of mitral insufficiency, based on a loud blowing apical systolic murmur, is justified in children, even in the absence of demonstrable cardiac enlargement." This is important, especially in view of the difficulty in detecting minor degrees of enlargement, even on fluoroscopy. It may be added that if such a loud apical systolic murmur is accompanied by evidence of cardiac enlargement the prognosis is worse. It is noteworthy that 13% of group I developed a definite organic cardiac lesion though their only abnormal sign when they were first seen was a "soft, poorly transmitted apical systolic murmur." The fact that made this finding significant is that they had had one or more attacks of rheumatic fever.

Lord WEBB-JOHNSON has been re-elected presid of the Royal College of Surgeons.

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[1] Kuttner, A. G., Markovitz, M. *Amer. Heart J.* 1948, 35, 711

THE Ministry of Health announces that about 21,3 general practitioners in Great Britain had applied by July to take part in the National Health Service. Doctors have accepted over 36,700,000 people, of whom 22,200,000 were previously on National Health Insurance lists. The Minister of Health has stated that if substantially more than 17,9 practitioners agreed, by July 5, to enter the service, the sum of £66 million offered in compensation for the loss of the right to sell practices would be proportionately increased.

nissing " sternebra corresponding to the sixth costal rtilage and rib as a small bilateral ossification centre, on to disappear by fusion with the fourth sternebra.

The interrelation of the prosimians was discussed by of. W. C. **Osman Hill**. The specialisations of the adagascar " lemuroidea " render them unlikely ancesrs of the higher primates. The oriental and African lorisoids," though showing specialisations, may conivably have arisen from a more generalised lorisoid, ffering little perhaps from an equally generalised rsioid. Some of the higher primates and later tarsioids ay have arisen from such a stock. The lack of detailed natomical information prevents a full assessment of e intergroup relationships. Professor Hill dealt fully ith the position of tarsius and some of its eocene fossil llies.

Illustrating his talk on the nasal fossa and paranasal nuses of the primates with detailed drawings, Prof. J. E. **Cave** characterised the primate type of nasal ssa as a short, high-pitched, forwardly situated cavity ith a reduced interorbital region and without a lamina ransversa or recognisable ectoturbinals. The immediate nechanical factors responsible for its form are cerebral xpansion and large eyes and orbits. He illustrated the xpansion of the paranasal sinuses, irrespective of their ite of origin, to almost every bone in the skull, together with the frequent extension into them of the turbinals. He emphasised the complexity of the region and the lifficulties attendant on its study.

From his observations on monkeys bred in the anatomy lepartment at Birmingham, Dr. F. M. P. **Eckstein** gave a detailed account of the dentition in the rhesus monkey, discussed the time and sequence of eruption of both deciduous and permanent teeth, and compared he teeth of rhesus monkey and man. He assessed he value of the information gained from these studies n estimating the age of specimens.

Dr. D. V. **Davies** called for more data in relation to he primate cardiovascular system. The complexities of the peripheral vascular system in the primates are n many places incapable of interpretation owing to ack of information. He discussed the effect of freeing he limb from the tissues of the trunk and the effect of lifferentiation and development of the muscle masses on the branches of the subclavian and axillary vessels and of the external iliac and femoral arteries. He also discussed factors contributing to the pattern and development of the arterial arches of both hand and foot and deplored the lack of knowledge regarding the branches of the internal and external carotid arteries.

The whole theme of this session was the need for further dissection of the primates. Thorough understanding of the position and interrelation of the various species awaits a revival of this time-honoured but much neglected approach to primate anatomy.

PHYSIOLOGY INCLUDING BIOCHEMISTRY

President : Prof. A. C. **Chibnall**, F.R.S.

With its meetings devoted to the medical significance of proteins and the physiological basis of neuromuscular lisorders, the title of this section might well have been Biochemistry including Physiology.

Recent Work on Proteins

Professor **Chibnall**, cautiously reviewing recent work on protein structure, with special reference to amino-acid nalysis, emphasised the difficulties encountered in elucidating the structure even of such proteins as insulin, with a molecular weight of 12,000 ; and he held out no mmediate hope of similar advances in the case of larger rotein molecules. Mr. J. A. V. **Butler**, D.SC., emphaised the danger of over-simplification in interpreting electrophoretic data : he viewed the prospect of " consulting-room electrophoresis " with some alarm.

Dr. **Leonard Colebrook**, F.R.S., and Mr. **Dallas Ross** described the treatment of burns at the special Medical Research Council unit at Birmingham. The volumes of plasma transfused are very large—up to 22 litres in one case—and are controlled principally by hæmatocrit readings. The results have been so successful, particularly in the younger age-groups, that many patients have recovered from burns of more than half their skin. These patients give rise to considerable surgical problems, but the grafting process is greatly helped by the new thrombin-fibrinogen glue. A simple apparatus for measuring the adhesive power of this glue excited general admiration.

Prof. E. C. **Dodds**, F.R.S., described recent work on the chemistry of the anterior-pituitary hormones and spoke of their great therapeutic possibilities. Here indeed are the hormonal " master keys." With the possible exception of the growth hormone, none has yet been obtained in a crystalline state. They are unstable substances, and commercial preparations are sometimes of doubtful potency.

Prof. G. W. **Pickering**, who reviewed the renin situation, could not claim that any type of chronic hypertension is produced by the renin mechanism. Thus even the chronically hypertensive Goldblatt animal has no demonstrable excess of renin. There must therefore be some other mechanism responsible for chronic hypertension.

Prof. N. F. **Maclagan** dealt with some nine flocculation tests which depend mainly on serum γ-globulin. He expressed a preference for the thymol and colloidal-gold tests and thought that they have considerable diagnostic importance and many unexplored applications in protein chemistry and in immunology.

Neuromuscular Transmission

The second session was opened by Sir **Henry Dale**, O.M., with a masterly review of the evidence for the chemical transmission of nerve impulses at the myoneural junction, illustrated by special reference to the action of curarine and botulinus toxin. If any doubters had been present they would have been convinced. This work still has a powerful appeal to the scientific emotions and produces a feeling of intense intellectual satisfaction. Sir Henry pointed out that the actual clinical applications of the theory have proved somewhat disappointing, but the recent work on the organic phosphates in myasthenia gravis may be considered a logical development of it. As a corollary there is evidence that in certain synapses neither acetylcholine nor adrenaline are acting, and the existence of at least one further chemical transmitter was postulated.

Prof. F. R. **Miller**, F.R.S. (University of Western Ontario), described experiments on the local application of acetylcholine to the central nervous system which he interpreted as evidence of normal function of acetylcholine in this region. Further evidence pointing in the same direction is the distribution of the enzyme cholineacetylase in the C.N.S., reviewed by Dr. W. S. **Feldberg**, F.R.S. The presence of this enzyme in high concentration provides suggestive, though not conclusive, evidence for transmission by the acetylcholine mechanism. Mr. **Bernard Katz**, D.SC., differentiated unicellular transmission, which is electrical in character, from synaptic transmission, which is chemical.

Dr. **Andrew Wilson** described the treatment of myasthenia gravis with di-iso-propyl-fluorphosphonate (D.F.P.), which is moderately successful but gives rise to certain side-effects such as nightmares. Changes in the true and pseudo-cholinesterase in the blood have little correlation with symptomatic relief. Dr. C. A. **Keele** has used mainly tetra-ethyl-pyro-phosphate (T.E.P.P.) for myasthenia. Its action is more prolonged than that of ' Prostigmin,' but cumulative effects occasionally produce diarrhœa and/or nightmares.

interference from anti-histamine drugs; and this may in fact be the case with the bronchial musculature. On the other hand, there is ample evidence for the potent effects of these drugs in diminishing or abolishing urticarial phenomena in the skin where histamine is acting on vascular structures probably some distance from the area in the skin where it is released. Several questions remain unanswered. How is histamine liberated and in what form does it normally circulate in the blood-stream? Does it play a rôle in normal tissue activity, and if so what is its functional significance? Do these considerations affect the practical use of anti-histamine drugs?

The story of modern anti-histamine drugs was taken up by Prof. J. H. **Gaddum**, F.R.S. The preparation of Bovet and Staub—929F—was originally studied for its anti-adrenaline action and only later found to have anti-histamine properties. Bovet introduced 'Neoantergan' in 1944, and this is at present the most potent and specific anti-histamine drug that is to be had. The similarity in the structure of neoantergan and histamine is additional evidence about the probable mode of action of anti-histamine drugs. In a brief survey of the other properties of this group he pointed out the possible relation between local anæsthetic effects and the relief of itching: in human beings somnolence often follows their administration, whereas in animals the central nervous system is stimulated.

Touching on clinical applications, Dr. R. B. **Hunter** stressed the importance of comparative anti-histamine studies in human beings as a method of assessing the potence of new preparations. Their major clinical use is in the treatment of urticaria. They have little effect on the skin manifestation of drug reactions unless these are urticarial. Eminently successful in the treatment of hay-fever, they also greatly benefit more than half the cases of perennial rhinitis, and they have proved their value in the treatment of sensitivity to liver extracts. Their main sphere of usefulness is in the treatment of those disorders which are characterised by superficial vascular phenomena. It is doubtful, said Dr. Hunter, whether any benefit can be attributed to them in the relief of asthma. Dr. H. G. J. **Herxheimer**, on the other hand, considered that they will benefit some cases of asthma when all other forms of treatment have failed.

Agents Affecting the Pars Nervosa

Professor **Verney** pointed out that the diuresis resulting from ingestion of water can be inhibited by emotional stress, exercise, the intravenous injection of posterior-pituitary extract, or the intra-carotid injection of hypertonic saline. The inhibition is independent of the nerve-supply to the kidney; it is unaccompanied by any change in the renal blood-flow; and it is not caused by the endogenous release of adrenaline. The response to sodium chloride is osmotically determined, and the term osmo-receptors has been introduced to describe the autonomic receptive elements which are located somewhere in the vascular bed of the internal carotid artery and which are functionally linked to the neuro-hypophysis. The same effect can be demonstrated when the increased osmotic pressure of the blood is within the physiological range.

Dr. L. M. **Pickford** said that nerve impulses arising in the higher centres also affect the rate of urine flow by their effects on the neurones which innervate the posterior lobe of the pituitary and thereby influence the amount of antidiuretic hormone liberated. Acetylcholine given intravenously or applied directly to the supra-optic neurones in the dog has an antidiuretic action. The inhibition occurs after denervation of the kidney, but does not occur when the posterior lobe of the pituitary has been removed. Additional evidence was presented to support the theory that transmission of nerve impulses in the supra-optic nuclei is by acetylcholine.

In this connexion Dr. W. S. **Feldberg** said that he had recently found that the posterior pituitary had no power to synthesise acetylcholine, but that the supra-optic nuclei gave high values.

The administration of nicotine intravenously in animals and in man results in an inhibition of water diuresis—an effect which is not produced in hypophysectomised animals. Prof. J. H. **Burn**, F.R.S., pointed out that in man the smoking of cigarettes can produce a similar effect which, in the susceptible individual, may last several hours. In animal preparations the administration of nicotine results in reduction of coronary blood-flow. If this is produced in man by the smoking of cigarettes, it is of considerable importance particularly in cases of coronary insufficiency.

Dr. W. J. **O'Connor** reported his studies on the response of the dog's kidney to the intravenous administration of hypertonic salt solutions. He presented evidence that the antidiuretic hormone controls the volume of fluid excreted by the kidney but is without influence on the total quantity of salt excreted.

ANATOMY AND ANTHROPOLOGY

President: Prof. H. A. **Harris**

Present Position of Primate Anatomy

The stimulating opening address, by Prof. F. Wood **Jones**, F.R.S., left the young anatomist in no doubt about his obligations in the field of primate anatomy and the need for a return to the scalpel and forceps. Professor Wood Jones attributed much of the misunderstanding regarding man's progenitors to the unqualified acceptance of the views of Darwin and Thomas Henry Huxley, neither of whom had the necessary first-hand knowledge of primate anatomy to support his pronouncements. Their postulates, it seems, were often ill-based and frequently ignored much of the available information which has since been proved reliable. Had Darwin been fully conversant with the works of Vrolik he would have known in detail the incidence of the entepicondylar foramen in the primates, of which, in man, he asserted, "there is generally a trace of this passage and it is sometimes fairly well developed." Likewise, Huxley's comparison of the development of dog and man was ill-founded and misleading, yet Darwin accepted this comparison without question. Professor Wood Jones pointed out that both Darwin and Huxley so influenced public opinion concerning the relation of man to the apes that their pronouncements led to much false satisfaction about man's phylogeny and produced a lull in original investigation which still lurks in our midst. Not until dissection of the primates reasserts itself as a method of investigation will the complexities of the problem be fully realised, not until the anatomist again takes up his scalpel and forceps shall we have the clarity of thought necessary to unravel this problem and to rid ourselves of the illogical arguments which still prevail.

Next Professor **Harris** discussed the value of radiography in the study of primate anatomy, particularly in view of the shortage of material and the lack of opportunity for dissection. The radiographic study of dolichocephaly, brachycephaly, and prognathism, together with their development, is well illustrated in the apes. He discussed tooth development and eruption and stressed the importance of the condyloid cartilage in the growth of the lower jaw. Most interesting perhaps were the radiographs of the developing pisiform bone in apes and monkeys. Possession of an epiphysis raises it to the level of a true carpal element. Professor Harris showed radiographically that the sternal angle in the gibbon is at the level of the third costal cartilage and not infrequently at the fourth, while he identified the ected cases respond satisfactorily and it appears that lio-iodine will have a useful place in the treatment cases of hyperthyroidism which recur after surgery. ere is probably little risk of late carcinogenesis, but ation is obviously necessary. Only a small proportion all cancers of the thyroid retain the function of iodine ncentration sufficiently to deliver therapeutically useful ses of radiation with radio-iodine, although there are tremely rare cases where functional secretion is a iking feature of both the primary and metastases and ere dramatic results can be obtained by radio-iodine erapy.

In general, it must be concluded that therapeutic ials of radioactive isotopes administered internally ould be limited to cancer and allied diseases; including lycythæmia vera. Professor Mitchell expressed the inion that it would be wise to avoid the therapeutic e of radioactive isotopes in any conditions in children.

This section held a joint meeting with the section of ild health to discuss Malignant Disease in Childhood ee below).

CHILD HEALTH

President: Sir **Leonard Parsons**, F.R.S.

The most notable events in this section were the iscussions on Neonatal Morbidity and Mortality and on alignant Disease in Infancy and Childhood.

eonatal Morbidity and Mortality

This discussion was opened by Dr. **Agnes R. acgregor** whose experience of neonatal pathology is nsurpassed in this country. She spoke of the great dvances which have followed routine necropsy of stillorn and newborn infants, and insisted that there is no ranch of medicine in which close collaboration between linician and pathologist is more rewarding. In a teachg maternity hospital she has found that 71% of newborn nfants coming to necropsy are prematurely born. sphyxia, intracranial hæmorrhage, and infections were otably commoner in premature than mature infants; nd the same was true, to a lesser extent, of congenital alformations. The escapist term "atelectasis" as a ause of death was rightly condemned, for it is never rimary.

Prof. **L. S. Penrose** discussed the ætiology of conenital malformations. He believes it is often impossible o differentiate between congenital malformations caused y inherited mutant genes, new mutations, and aberrant ntra-uterine development. He recalled the need to study he pedigree when investigating the origin of congenital haracters and anomalies. Most congenital abnormalities re inherited—particularly minor ones, since children ith major defects often perish. There is a 5% chance f an anencephalic fœtus being followed by a sibling with pina bifida, and another 5% chance of siblings having ther malformations. The incidence of congenital malormations is higher in offspring born at the extremes of he reproductive period and particularly towards the pper extreme; 24 years is probably the safest hild-bearing age from both this and the obstetric iewpoint.

A pertinent account of modern trends in the nutrition f premature infants was given by Dr. **Winifred Young**, ho recalled that premature infants retain more protein, alcium, and phosphorus per unit of weight than do ature infants. This fact deserves wider recognition, s also does her assertion that even small premature nfants are able to digest their full requirements, which re small during the first few days owing to a low metaolic-rate, and thereafter exceed those of mature infants. ppreciation of these facts has produced more rapid eight gain and better health in premature infants than ormerly, with closer approximation to normal intraterine nutrition in the later weeks of pregnancy.

The contribution of obstetric factors to neonatal morbidity and mortality was reviewed by Prof. **N. B. Capon**. He pointed out that the premature infant's brain is particularly liable to be traumatised at birth, owing to the softness of the immature protective bones and membranes. Intracranial hæmorrhage is a less important cause of signs of cerebral irritation than excessive compression, venous congestion, and œdema. Anoxia is a major danger, particularly with antepartum hæmorrhage and trauma to the fœtal head. Professor Capon commended the modern obstetric practices of avoiding unduly long labour and of more often performing elective cæsarean section; for these trends have improved the prognosis in many cases of complicated birth. He spoke of the need for caution in the use of analgesics and anæsthetics, which are a major cause of apnœa after birth, and of consequent morbidity and mortality in the newborn.

Dr. **J. L. Henderson** emphasised the greater risk of infants contracting infections in crowded institutions than in the home. He deplored the prevailing trend towards confinement in maternity hospitals and nursing-homes, since few institutions have been built in accordance with modern opinion. Mammals instinctively leave the herd and seek isolation to give birth to their young, and tend them in the early days: human mothers are no exception—a fact often ignored in this materialistic age. In the first week of life the incidence of infections is low, but thereafter it is high, causing more morbidity and mortality than all other disorders. The tissues of the newborn infant react poorly to infection, for there is a lack of specific active immunity, and local tissue response is poor. Inherited passive immunity is a partial safeguard; but active immunity develops unduly slowly in the first six months. The common neonatal infections—staphylococcal dermatitis, conjunctivitis, and oral thrush—are usually contracted after birth. Staphylococcal infection, which is endemic in maternity hospitals, is much the commonest cause of neonatal infection. The frequency of staphylococcal infections in infants, mothers, and nurses can be correlated. In addition to the various forms of dermatitis, such as paronychia and bullous impetigo, *Staphylococcus aureus* causes most cases of conjunctivitis. Oral penicillin therapy is reliable in the first month of life; it may be given in doses of two 10,000-unit tablets, crushed and dissolved in a little milk at each feed. Thrush should never be regarded as a benign disease since it may occasionally invade the œsophagus when it may cause death. Epidemic gastroenteritis, the most dreaded neonatal infection, is probably caused by a variety of organisms. The need for constant vigilance and immediate isolation of cases of suspected infection in institutions is paramount; and dispersal of infants with their mothers in single rooms or very small units is desirable.

Malignant Disease

This discussion was introduced by Prof. **Wilfrid Gaisford** who summarised contemporary knowledge of the clinical features and pathology. He showed that the problem is by no means negligible, since 4429 children under 14 years had malignant disease in Britain in a recent 5-year period. He insisted that with recent therapeutic advances the old pessimistic attitude is no longer warranted. Tumours are commoner in the first 5 years than in later childhood. The three principal groups of malignant tumour in children are intracranial tumours, leukæmia, and renal tumours. The most common intracranial tumours are medulloblastomas and astrocytomas; both are curable—the former by radiotherapy and the latter by neurosurgery. Unfortunately, it is usually impossible to differentiate these tumours without surgical exploration. Malignancy should be suspected when persistent swellings and persistent adenopathy are found. The curability, in many

RADIOLOGY

President: Dr. S. COCHRANE SHANKS

Radioactive Isotopes

In opening a discussion by the radiotherapeutic part of this section, Prof. O. R. FRISCH, F.R.S., of the Cavendish Laboratory, summarised the behaviour and properties of radioactive isotopes. All elements have radioactive isotopes—i.e., species with identical chemical properties but different atomic weight, whose nuclei are unstable. Only radioactive bodies with a half-life at least comparable with the age of the universe, and their descendants, which are often shorter-lived, are found in nature. All other radioactive isotopes, and in fact most of those in use, must be produced artificially, by bombarding some stable element either with fast-moving ions, from a cyclotron or similar apparatus, or with neutrons from a chain-reacting fission pile. Many isotopes can be produced in fairly concentrated form by chemical separation methods. In a pile, capture of slow neutrons will convert a little of the ordinary stable phosphorus isotope, P^{31}, into radioactive P^{32}; but this cannot be easily separated, and the radioactive isotope is consequently obtained only in a very dilute form. However, some of the fast neutrons from the pile can be used to convert stable sulphur 32 into radioactive P^{32}. This can be extracted by ordinary chemical means and obtained in a concentrated form, though only in small amounts. The possible replacement of radium by cobalt 60, an artificial gamma-ray emitter, was mentioned. The method of depositing a suitable isotope, or special compound of one, at the appropriate place in the organism by the utilisation of metabolic properties is probably capable of considerable development. Geiger counters are mostly used to measure the weak radioactivities encountered in medical and biological work, especially in the use of radioactive tracers. An entirely different counter is now being developed, based on recording the small flashes of light which fast electrons produce in passing through naphthalene and some other chemicals. This method may be useful for counting gamma rays. Recent developments of autoradiography include the use of emulsions poured on to the histological preparation and subsequently developed. A more elaborate technique makes use of a kind of electron microscope in forming an enlarged image of the specimen by focusing the electrons emitted by the radioactive tracer deposited in the section. For this method, the tracer must show the kind of radioactivity in which electrons of well-defined energy are emitted.

In a paper on the Biochemical Applications of Radioactive Isotopes as Tracers, Dr. A. S. MCFARLANE said that experiments with P^{32} to study the metabolism of bone and muscle illustrate the general pattern of a vast amount of biochemical work which is going on with tracers. It has become evident that within the cell there exist numerous chains of metabolic reactions leading from the simplest diffusible metabolites to highly complicated molecules and macromolecules. These chains cross at different levels and establish, at the intersections, metabolic pools in which the tracer element escapes in some measure from one pathway into others. In each kind of cell there are some favoured chemical reactions determined by its enzyme heritage. It is an important part of modern biochemistry to discover what the favourite reactions are. The precursor type of radioactive tracer experiment goes extremely well with amino-acids, sugars, keto-acids, and hydroxy-acids, and indeed with the general run of intermediary metabolites. With the highly important organic phosphorus compounds a difficulty arises—that no labelled substance has yet been found from which the phosphate radical is not detached at once in the tissues. In this important field attention should be focused more on the carbon skeletons to which the labile phosphate groups are attached. Dr. McFarlane mentioned also the use of radioactive tracers as non-specific indicators—e.g., the use of sodium 24 to determine the volume of the extracellular space and to measure blood-flow.

In general, it can be said that a new biochemistry is being discovered by the use of isotopic tracer methods. In all this work the Americans have achieved great progress. However, ample supplies of isotopes for tracer purposes are now available in this country, mostly from American sources but also from Canada, and home production is rising steeply. These isotopes are already being used in about sixty medical research projects covering a wide range of investigations.

Radiotherapeutic Aspects of Radioactive Isotopes were discussed by Prof. J. S. MITCHELL, who emphasised that the immediate field of application of radioactive isotopes as therapeutic agents and radioactive sources is relatively limited. From the long-term point of view the treatment of cancer and allied diseases is most likely to be advanced by the encouragement of tracer investigations using both radioactive and non-radioactive isotopes. So far our experience of radioactive isotopes in this country has been limited to tracer amounts. It is now evident, mainly from American work, that radio-phosphorus, P^{32}, used as inorganic phosphate, and to a much smaller extent the radio-iodines, especially I^{131}, can justifiably be employed as therapeutic agents for internal medication in some cases. The suitability of radiocobalt, Co^{60}, as a source of gamma radiation for radiotherapy has been confirmed, and there is a limited scope for artificial radioactive isotopes in beta-ray applicators. Radiophosphorus and the radio-iodines are the only selectively concentrated isotopes, and radiosodium, Na^{24}, is the only uniformly distributed isotope whose use in soluble inorganic form for internal administration has reached the practical therapeutic stage. Professor Mitchell mentioned investigations with the weakly radioactive radiocalcium, Ca^{45}, the radio-arsenics in leukæmia, and the interesting element astatine 85^{211}, which is concentrated in the thyroid. With radio-strontium, Sr^{89}, there is a risk of carcinogenesis. The use of insoluble radioactive colloids, including $CrP^{32}O_4$, $Mn^{52}O_2$, and Au^{198}, by intravenous injection in the treatment of reticulo-endothelial diseases and for the "injection implant" has been reported. It seems doubtful whether the therapeutic use of inorganic radioactive isotopes, even P^{32}, will stand the test of time, and the development of selectively concentrated organic compounds carrying radioactive isotopes is a much more promising line of approach.

The physical properties, dosimetry, and practical radiotherapeutic applications of P^{32}, I^{131}, and Na^{24} were next discussed. Radiophosphorus has been used in the treatment of patients since 1936. The only disease in which it has been found to give better results than X-ray therapy is polycythæmia vera, in which it is now generally believed to be the treatment of choice. The possible risks of induction of acute leukæmia in a small proportion of cases and production of deleterious effects on the reproductive organs were mentioned. In chronic myeloid and chronic lymphatic leukæmia the results and limitations of radiophosphorus therapy are similar to those of X radiation, and supplementary X-ray therapy may be needed. In most cases of lympho-sarcoma treatment with radiophosphorus is probably less beneficial than with X rays. The response of Hodgkin's disease is unsatisfactory and P^{32} is useless in acute leukæmias. In cancer generally radiophosphorus administered as inorganic phosphate is of no therapeutic value. Radiosodium is probably less effective as a therapeutic agent than is radiophosphorus.

Most of the clinical trials of the radio-iodines in the U.S.A. have been carried out in hyperthyroidism

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rof. **Ronald Hare** referred to the possibility of in variations somewhat analogous to smooth and rough ains in bacteria; this was hinted at in Burnet's earlier rk and may be related to problems of prophylaxis. aking of the mass production of viruses for prophy-is by egg inoculation, he suggested that in the present te of knowledge, and with existing rationing trictions, the vast number of eggs which would be uired could perhaps be used to better advantage.

Prof. **W. I. B. Beveridge** would have none of Professor re's gloom, claiming that much that is already known ld be used with profit. Among other arresting ints, he mentioned the specific blocking effect of the iedländer polysaccharide on the virus of mumps.

Dr. **M. G. P. Stoker** concluded with a short survey the problems of vaccination against smallpox; and ce again the problem of "blocking" and interference ose, bearing, as it does, on the relation of the effective-ss of a given batch of vaccine to the behaviour of the tive and inactive particles in that batch. Throughout e discussion the theme of interference and specific ocking continued, offering a new field of research in our tack on virus prophylaxis.

ther Communications and Demonstrations

Dr. **K. C. Dixon** produced a stimulating paper on the fects of glucose and oxygen deprivation on the leakage potassium from the living cell. Though the observa- ons are not new, they afford an excellent example of a ndamental approach too often neglected. Dr. N. H. **ARTIN**'s communication on electrophoretic fractiona- ion and the light it throws on disease processes in eneral provoked an animated discussion. Demonstra- ons were mounted both at the Strangeways Laboratory, here Miss **Honor Fell**, D.SC., and her group gave an xcellent survey of the work being done there, and in he department of pathology where the beautiful sections repared by Dr. **J. Gough** and Dr. **J. E. Wentworth** howed how much can still be learnt from careful xaminations of macroscopic specimens.

ANÆSTHETICS

President: Dr. Z. **Mennell**

næsthesia for Chest Surgery

The anæsthetist, said Dr. **Joan Millar**, can now rovide operating conditions satisfactory to both patient nd surgeon, so that the latter is no longer hindered by ck of time. Three essential factors are the main-enance of an airway, the prevention of anoxia, and the placement of blood as it is lost: the particular anæs- etic agent used is of less importance than practical nowledge and experience. Careful preoperative pre- aration and assessment of cardiac and respiratory nction are required. Local analgesia is used for ndoscopy, for drainage of empyemas and lung abscesses, nd in the surgery of pulmonary tuberculosis. (In xtrafascial apicolysis unilateral vagal block at the base f the skull is useful to prevent coughing.) For lung section—which is now possible in any case of pulmonary ppuration provided the extent of the disease does not reclude surgery—Dr. Millar recommended general næsthesia. Controlled and assisted respiration are best served for the experienced anæsthetist. Useful though rare may be, it is liable to cause residual muscular eakness and a reduction in tidal exchange, and thus redispose to postoperative atelectasis. Rapid restora- on of normal respiratory function is the aim, and mmediate bronchoscopic aspiration should be under- ken if need be. In difficult cases radiography imme- ately after operation is useful to reveal pneumothorax r atelectasis.

Dr. **E. H. Rink** related his experiences as anæsthetist in 50 cases of congenital pulmonary stenosis treated surgically. There were 8 deaths within six hours, and 1 later; but the results more than justified the operation. Though it might last five hours, and the children were mostly undersized and of poor resistance, they stood it well. Cyclopropane or ether was given through an endotracheal tube with controlled respiration.

Dr. **G. S. W. Organe**, Dr. **T. C. Gray**, and Dr. **H. H. Pinkerton** all questioned whether, for thoracoplasty, local analgesia is really preferable to general anæsthesia. Curare, said Dr. Gray, enables the operation to be done under very light narcosis.

Abdominal Relaxation

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sickness should be more fully transferable than at present and that it should all be collated in the health office.

In the discussion, Mr. H. J. McCURRICH contended that all the larger hospitals should become teaching centres for doctors, nurses, and ancillaries. The family doctor should have ready access to his patients in hospital but should not undertake treatment. He feared that the difficulty of recruiting nurses will increase, for nursing cannot compete with other occupations in amenities. In publicity campaigns, therefore, the appeal should be to ideals and not to creature comforts. Dr. JEAN MACKINTOSH felt that the M.O.H. should assist in assessing priority where maternity beds are short. In her view it is not sufficient for local-authority medical officers to attend at outpatient departments and ward rounds; they should have actual clinical care of patients in hospital.

Poliomyelitis

Dr. WILLIAM GUNN said that in the present century, and particularly in recent decades, poliomyelitis seems to have acquired special malignant characteristics expressed in periodical explosive prevalence and high clinical severity. Active and passive immunisation methods have found little place in prevention or treatment. Vaccines have proved ineffective or dangerous. Passive immunisation with serum is applicable only in certain cases, for the attack-rate following exposure is normally low and the period of immunity afforded by serum is only about three weeks. He felt that the greatest success up to now has been attained by measures directed against infection by droplet nuclei—restriction of travel, prevention of close assembly, and segregation of possible carriers. Strict personal hygiene, avoidance of fatigue, and avoidance of respiratory infections are important. It is perhaps significant, he said, that the largest epidemic in our history, in 1947, coincided with one of the hottest summers on record.

Dr. F. W. BUNTING favours more rigid isolation of actual cases and avoidance of large assemblies—particularly children's film matinées which he described as a "Clapham Junction for virus dissemination."

Dr. STANLEY BANKS pointed out that present notifications may give a false impression, since they include abortive cases, whereas formerly only the paralytic cases were actually brought to notice. He questioned the value of the complement-fixation test: people contract poliomyelitis who have previously shown a high titre of agglutinins. He criticised administrative instructions issued by the Ministry of Health and medical officers of health. In his opinion the prohibition of tonsillectomy during epidemics is the only useful preventive measure. Dr. J. ALISON GLOVER thought that every M.O.H. should pay frequent visits to swimming-baths; but the bad ventilation rather than the water is the danger. Isolation of carriers he regards as impracticable.

Morbidity Statistics

Dr. P. L. McKINLAY asked for more extensive sickness records, because he believes much of the present sickness is preventable. Far too little attention is paid by medical officers of health and others to the value of statistics, which are a record of progress and a guide to action. The Ministry of National Insurance records should prove to be a wonderful source of information. The conditions causing incapacity for work are very different from those producing death. The most common of them are respiratory catarrh, rheumatism, superficial septic conditions, gastric disturbances, and general debility. The death-rate is falling, but chronic incapacity is increasing. Many people are being kept alive but are not functioning as useful members of the working community. Hospital records are too selective to give a true picture of the morbidity-rates in the general population.

Dr. J. MADDISON said that the M.O.H. should be to get the help of a team of investigators—r medical officers, a statistician, clerical assistants, p card machinery, calculating machine, and field work for special inquiries. Just as today he refers his cli cases to the appropriate doctor, so then he could re his statistical and research problems to a team of ex

PATHOLOGY AND BACTERIOLOGY

President: Prof. H. R. DEAN

After a graceful welcome from Professor DEAN, the first session opened with a discussion of advances i knowledge of the Rh factor and their implications.

Rhesus Factor

Prof. D. F. CAPPELL spoke of the risks of i- immunisation of the Rh—ve mother by the Rh+v foetus and commented that, while ABO incompatibility of itself rarely produces such a dramatic picture, i- immunisation of the mother is significantly less when the ABO groups of mother and child are compatible. From his own observations the hæmolytic anæmia produced i the presence of the "incomplete" or "blocking" antibodies is not significantly different from that found i the presence of the complete antibodies. He urged clarification of nomenclature on the basis of Fisher's classical work and the dropping of the alternative.

Dr. P. L. MOLLISON, in a practical survey of the treatment of hæmolytic disease of the newborn, emphasised the difficulty in this country of comparing present results with results before 1943 when Coombs's test came into use, or with results in other countries where that test is still not used widely. He stressed the value of exchange transfusion, and showed that a more rapid exchange of erythrocytes may be achieved by using slightly concentrated erythrocyte suspension.

To round off a well-balanced discussion, Mr. R. R. COOMBS, PH.D., regaled the section with an account of his investigations into the intricacies of hæmolytic disease of newborn foals and—even more important— his studies in rabbits, demonstrating anew the lessons to be learned from other mammals.

Thymus in Myasthenia Gravis

Dr. A. B. BRATTON recalled that morbid-anatomic assessment does not support the view that persistence of the thymus is associated significantly with myasthenia gravis. He admitted, however, that a number of myasthenics on whom thymectomy was performed had immediate and protracted remissions after operation— the reason remaining obscure. Of 70 specimens of thymus from myasthenia cases 11 showed neoplasia

Streptomycin

Dr. M. H. GLEESON-WHITE followed with a brief account of 4 cases of meningitis caused by *Hæmophilus influenzæ* of the Pitman B strain which were treated with streptomycin. Success was attained in 3, but the 4th relapsed and the organism showed enhanced resistance to streptomycin. No toxic manifestations were encountered though full intrathecal and intramuscular dosage was used.

Hepatitis

Dr. G. W. M. FINDLAY quoted Peter Martyr, whose works, published in 1595, seem to have been a complete anticipation of many of the recent reports on the part of nutritional deficiency in the production of hepatic lesions. In the general discussion Dr. J. N. P. DAV (Uganda) and Dr. GILLMAN (Johannesburg) interesting and suggestive observations on the association of endocrine disturbance with liver damage—w seems to open a field for more general study of relationship of cholesterol metabolism to liver damage

Prophylaxis of Virus Infections

Dr. C. H. ANDREWES, F.R.S., said that by no m all the potential approaches to wholesale prophyl e been tapped: and he mentioned in particular the nomenon of interference first observed in the study plant viruses.

Prof. **RONALD HARE** referred to the possibility of ain variations somewhat analogous to smooth and rough ains in bacteria; this was hinted at in Burnet's earlier rk and may be related to problems of prophylaxis. eaking of the mass production of viruses for prophyis by egg inoculation, he suggested that in the present te of knowledge, and with existing rationing trictions, the vast number of eggs which would be quired could perhaps be used to better advantage.

Prof. **W. I. B. BEVERIDGE** would have none of Professor re's gloom, claiming that much that is already known uld be used with profit. Among other arresting ints, he mentioned the specific blocking effect of the iedländer polysaccharide on the virus of mumps.

Dr. **M. G. P. STOKER** concluded with a short survey the problems of vaccination against smallpox: and ice again the problem of "blocking" and interference ose, bearing, as it does, on the relation of the effectivess of a given batch of vaccine to the behaviour of the tive and inactive particles in that batch. Throughout ie discussion the theme of interference and specific locking continued, offering a new field of research in our ttack on virus prophylaxis.

ther Communications and Demonstrations

Dr. **K. C. DIXON** produced a stimulating paper on the ffects of glucose and oxygen deprivation on the leakage f potassium from the living cell. Though the observaions are not new, they afford an excellent example of a undamental approach too often neglected. Dr. **N. H. IARTIN**'s communication on electrophoretic fractionaion and the light it throws on disease processes in eneral provoked an animated discussion. Demonstraons were mounted both at the Strangeways Laboratory, here Miss **HONOR FELL**, D.SC., and her group gave an xcellent survey of the work being done there, and in ne department of pathology where the beautiful sections repared by Dr. **J. GOUGH** and Dr. **J. E. WENTWORTH** nowed how much can still be learnt from careful xaminations of macroscopic specimens.

ANÆSTHETICS

President: Dr. Z. MENNELL

næsthesia for Chest Surgery

The anæsthetist, said Dr. **JOAN MILLAR**, can now rovide operating conditions satisfactory to both patient nd surgeon, so that the latter is no longer hindered by ick of time. Three essential factors are the mainenance of an airway, the prevention of anoxia, and the eplacement of blood as it is lost: the particular anæsietic agent used is of less importance than practical nowledge and experience. Careful preoperative prearation and assessment of cardiac and respiratory unction are required. Local analgesia is used for ndoscopy, for drainage of empyemas and lung abscesses, nd in the surgery of pulmonary tuberculosis. (In xtrafascial apicolysis unilateral vagal block at the base the skull is useful to prevent coughing.) For lung section—which is now possible in any case of pulmonary uppuration provided the extent of the disease does not reclude surgery—Dr. Millar recommended general næsthesia. Controlled and assisted respiration are best served for the experienced anæsthetist. Useful though urare may be, it is liable to cause residual muscular eakness and a reduction in tidal exchange, and thus redispose to postoperative atelectasis. Rapid restoraon of normal respiratory function is the aim, and nmediate bronchoscopic aspiration should be underaken if need be. In difficult cases radiography immeiately after operation is useful to reveal pneumothorax r atelectasis.

Dr. **E. H. RINK** related his experiences as anæsthetist in 50 cases of congenital pulmonary stenosis treated surgically. There were 8 deaths within six hours, and 1 later; but the results more than justified the operation. Though it might last five hours, and the children were mostly undersized and of poor resistance, they stood it well. Cyclopropane or ether was given through an endotracheal tube with controlled respiration.

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Intubation in Childhood

Dr. ROBERT COPE explained that in infants the laryngeal aperture is tiny, and an intratracheal tube must be introduced slowly. He reviewed the various stages of early life at which this may be necessary, from the relief of asphyxia neonatorum onwards. In the first few days, when operating on some major abnormality, a perfect airway may make all the difference. In the operations of the first few weeks—for pyloric stenosis, duodenal atresia, or intussusception—a tube allows anæsthesia to be lightened without laryngeal spasm.

Analgesia in Midwifery was discussed jointly with the section of obstetrics and gynæcology (see below).

OBSTETRICS AND GYNÆCOLOGY

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Infertility

To prevent the great unhappiness caused to so many couples by sterility Dr. BETHEL SOLOMONS advocated premarital tests. His opening paper covered the whole subject of infertility, but two facts in particular emerged —firstly, that he puts male responsibility as high as 50%, and secondly that deaths *do* occur from insufflation of the fallopian tubes. The danger of gas embolism is greatest with oxygen and air, but he has seen a death during insufflation with carbon dioxide. It is a duty, he said, to publish fatal cases of this kind. Mr. ALBERT SHARMAN held that for uterotubal insufflation only carbon dioxide should be used: he advised that insufflation should take place in the premenstrual phase, when a premenstrual biopsy can be performed after it.

Mr. KENNETH WALKER's main theme was the importance of complete examination of semen specimens; but he also dwelt on the abnormalities associated with ejaculation and mentioned the possibility of retrograde ejaculation into the bladder, as occurs after prostatectomy. He made a plea for the wider use by gynæcologists of the post-coital test, which is, after all, the final test of the man's ability to impregnate his wife.

Mr. PERCY MALPAS dealt with the difficult subject of recurrent abortion. He thinks that perhaps we have over-emphasised the hormonal factor. Apart from cases where a well-defined organic basis can be found, such as renal disease or some local abnormality, he contended that abnormalities of the nervous system, affecting uterine quiescence, are mainly responsible for habitual abortion in the first few months of pregnancy. If a sustained nervous inhibition is the means by which the pregnant uterus is normally kept quiescent, rest should be the main therapeutic agent in these cases.

Mr. CECIL BINNEY, a barrister-at-law, brought his expert legal mind to bear on the subject of artificial insemination. He argued that artificial insemination with donated semen cannot be used as grounds for divorce, since it cannot be interpreted as an act of adultery. (Adultery is a sexual act, which has nothing to do with the conception of a child, and birth of a child without a sexual act can hardly be adultery.) Nor can artificial insemination be used as grounds for divorce in relation to nullity. On the other hand donor insemination introduces almost insuperable difficulties in conne with the law of inheritance of settled funds. In subsequent lively discussion on this, as on other aspe of insemination, the general view seemed to be that practice should be left to somebody else.

The frequency with which pregnancy follows adopt of a child led to the suggestion that babies might b borrowed for the specific purpose of relaxing tension an stimulating mother-love. Fanciful though this may b the meeting was left with the feeling that there are mo things in heaven and earth than are dreamt of in o philosophy; members were reminded that in assessing results in the cure of infertility they must be humble because nature herself so often cures without human ai

Analgesia in Midwifery

Prof. W. C. NIXON opened the second discussion wit an inspiring paper which went far beyond the consideration of particular analgesics or anæsthetics. He pointed out that the more complete the antenatal preparatio of the patient, the more physiological her labour wil be and the less pain she will have. The relief of pai in the labour ward should begin in the antenatal clinic. Confidence thus inspired in the patient goes a long way towards removing fear and inhibitions that ultimately impede the natural processes of childbirth. Professor Nixon spoke also of the need for sleep during labour, especially at the natural time for sleeping at night, and discussed the various drugs that might be used to promote it. He discouraged the use of barbiturates, but from further experience at University College Hospital he advised the use of pethidine in doses of 150 mg. At this hospital investigations are being carried out by full-time research anæsthetist appointed to the obstetr department, and this is a development in hospital organisation that other units should pursue. On if obstetricians and anæsthetists work together satisfactory team-work be attained and the pati be legitimately relieved of unnecessary pain.

The next speakers were Dr. P. J. HELLIWELL Dr. A. M. HUTTON, both of whom are working with research grant at Guy's Hospital. Reporting at so length on their investigations with 'Trilene' in midwifery they concluded that the danger of the self-administere trilene inhalers is by no means negligible, and that th patient should never be left alone with a self-administering trilene inhaler. The value of trilene in midwifery is nevertheless very considerable, and the general vie is that it is the most useful supplement for gas-and-oxygen or gas-and-air. During the discussion chloroform received many bouquets from experienced and older practitioners, and caudal analgesia was mentioned as very valuable in carefully selected cases and in experienced hands.

The Third Stage and its Complications

The third stage of labour appropriately occupied th final stage of the section's meetings.

Mr. J. D. S. FLEW put in a strong plea for the use oxytocic drugs—ergometrine in particular—before t delivery of the placenta in cases of hæmorrhage. siderable changes are nowadays being made in management of the third stage, both normal abnormal. In particular the older teaching of Cr expression and bimanual compression is now recogni as often dangerous and productive of shock. This a vitally important point, because midwives up and do the country are still being taught manual removal the conscious patient—a method which they would ne carry out in practice—as well as Credé expressio Far less harm would be done if they were allowed to g an oxytocic drug to control immediate hæmorrhag Later speakers all agreed with Mr. Flew in condemni the old-fashioned methods of expressing the placent which can often far more safely be expressed from th ver segment of the uterus and upper vagina by supra-bic pressure and gentle traction on the cord than by shing the uterus down into the pelvis. The shock oduced by the Credé expression is apparent to all, d it is time that the third stage of labour was rewritten the textbooks.

Prof. H. L. SHEEHAN's work on obstetric shock was ell known to his audience, and he explained many the facts he has demonstrated in published papers. e two outstanding facts that emerged from his experi-ce are that death may be caused by traumatic pro-dures undertaken for the removal of the placenta and so by undue prolongation of the third stage of labour. he answer seems to be that manual removal of the acenta under surgical anæsthesia is far safer, because ss traumatic, than repeated Credé expression. Now at the danger from sepsis is so much less, manual moval of the placenta need no longer be regarded a last resort for the dying.

Finally, Dr. P. L. MOLLISON spoke of the importance f the rhesus factor in relation to the third stage of bour. Administration of Rh-positive blood to a h-negative woman not only may endanger her life mmediately but also makes it highly probable that in ny subsequent pregnancy her baby will be affected by æmolytic disease. For this reason if no other, routine esting of all pregnant women for the rhesus factor desirable. Investigation of cord blood from babies uspected of hæmolytic disease is also necessary.

MISAPPREHENSIONS ABOUT N.H.S.

IN a speech at Preston on July 5, the opening day of he National Health Service, Mr. Aneurin Bevan, inister of Health, spoke of misapprehensions about the ervice and made the following statements:

1. No insurance qualification is necessary.
2. There is *no* obligation on patients to take advantage of e scheme—they can use it or not, as they prefer, but we elieve that soon nearly everyone will be using it. The more niversal it becomes, the more successful it will be.
3. There is *no* limit to either the cost or the quality of the rugs which may be prescribed under the scheme, provided hat they are necessary.
4. There is *no* rule that a doctor must not visit patients n their homes unless their condition requires it. He is free o visit when he likes—and under an obligation to do so when he patient's condition makes this necessary. (On the other and, patients are expected to attend at the surgery when they an.)
5. There is *no* rule that doctors cannot see patients by ppointment. We hope they will do so as much as they can.
6. Doctors must not accept any payment for treatment iven to patients on their public lists. To do so would be a reach of their terms of service, for which there might be a enalty.
7. There are some doctors who are reported to be telling ome of their patients that they will accept them as paying atients but not under the National Health Service. Such onduct is of course a complete abuse of the doctor's right f free choice of patient; and those doctors who are guilty f it will be condemned by their colleagues as a disgrace to heir profession.

He added that there were three ways in which all could elp the new service: (1) by coöperation between all oncerned in the scheme—practitioners, patients, and dministrators; (2) by approaching the service with the etermination to make it work well; and (3) by not ushing for treatment which is not urgent in the early ays of the scheme. According to the *Manchester uardian*, he claimed that there had been no political ias in his selection of people to take part in the voluntary achinery. He had achieved that universal measure of isagreement that was evidence of complete impartiality, nd already a team spirit had grown up. He had a brief, but utterly sincere word of thanks" for all who ad done the voluntary work of the past and had handed ver so much that was a good going concern.

In England Now

A Running Commentary by Peripatetic Correspondents

JULY 5.—For the first time in local memory, the surgery is empty on a Monday morning; and after reading "Question Time" in Parliament that is about the only thing that could still surprise me.

Apart from a few telephone inquiries from people who heard about the service from Mr. Attlee for the first time, and one pessimist who wanted to know whether registering with three doctors would assure the attention of one, there is only the steady drip of cards —now apologetically and unobtrusively pushed through the letter box—to give one something to do for a living. Omitting wealthy over-eighties, only one patient has so far paid me the doubtful compliment of wishing to remain private. I suppose she imagines that I visit her in the mornings because she likes to take the dogs for a walk in the afternoons and can afford to pay for her fancies. But, if she only knew, the visiting-list will be compiled exactly as before, according to urgency first, physical condition second, and convenience third. Though placed third, the convenience of the patient always *has* been studied as a matter of course: one would not dream of asking a mother with a young family to waste her time waiting about in the surgery, nor would one think of visiting her at the baby's feeding-times if this can be avoided. It seems to me more important to stress this than to manufacture a hard and fast distinction between the two categories of patients so as to give the private patient something tangible to pay for.

It would be a pity if attention to the patient's convenience became a marketable commodity which people felt they could not expect within the service. They have, alas, assimilated this idea all too thoroughly already. The easiest way of getting the bewildered look off their faces is to tell them that no doctor in his senses *likes* to work with a crowd of aggrieved and apprehensive patients waiting on the far side of the door.

* * *

The communal bathrooms of our residents' quarters provide unrivalled opportunity for the study of shaving habits. Our Welsh Wizard, always the last to arrive, hurries in completely dressed except for his jacket, with his left hand in his trouser pocket and a cigarette dangling from his mouth. He shaves still with cigarette in mouth and ash dropping into the basin, still with hand in trouser pocket, generously splashing soap-suds over his shirt front. The shaving itself takes little time but is followed by an amazing performance. Many dry and strop their razor blade after use on the palm of their hand, but our friend protrudes his abdomen and dangerously sweeps the blade up and down the upper part of the fly of his trousers. I have suggested that he has a piece of leather sewn in this situation but he ignores my advice. He struts out of the bathroom leaving the door wide open regardless of nudity prancing about.

How different is the technique of our slow and highly conscientious surgeon, who takes at least half an hour to shave. Each hair receives individual attention, each small area is carefully shaved again and again, carefully massaged with finger-tips, lovingly stroked, and then relathered. Knowing him as I do, I would have predicted such a palaver even if I had never seen him shave.

Our anæsthetist adopts a totally different policy. He wets a face-flannel and slowly and laboriously wipes it over his face, gazing at himself in the mirror. This is repeated many times for at least five minutes, with a careful inspection of his image between each smearing. Then he massages one of those brushless creams tenderly into his bristly jowls for a long time without any apparent effect. The rest of the business proceeds at the same slow pace with frequent resort to the face-flannel between the periods of razor-scratching. When at last the operation is over our dope doctor still looks as if he needs a shave.

Most of us have never been taught how to shave and these personal conceits of style, these individual habits associated with shaving, are, I submit, a guide to character and personality worthy of the psychologist's attention.

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To prevent the great unhappiness caused to so many couples by sterility Dr. Bethel Solomons advocated premarital tests. His opening paper covered the whole subject of infertility, but two facts in particular emerged—firstly, that he puts male responsibility as high as 50%, and secondly that deaths *do* occur from insufflation of the fallopian tubes. The danger of gas embolism is greatest with oxygen and air, but he has seen a death during insufflation with carbon dioxide. It is a duty, he said, to publish fatal cases of this kind. Mr. Albert Sharman held that for uterotubal insufflation only carbon dioxide should be used: he advised that insufflation should take place in the premenstrual phase, when a premenstrual biopsy can be performed after it.

Mr. Kenneth Walker's main theme was the importance of complete examination of semen specimens; but he also dwelt on the abnormalities associated with ejaculation and mentioned the possibility of retrograde ejaculation into the bladder, as occurs after prostatectomy. He made a plea for the wider use by gynæcologists of the post-coital test, which is, after all, the final test of the man's ability to impregnate his wife.

Mr. Percy Malpas dealt with the difficult subject of recurrent abortion. He thinks that perhaps we have over-emphasised the hormonal factor. Apart from cases where a well-defined organic basis can be found, such as renal disease or some local abnormality, he contended that abnormalities of the nervous system, affecting uterine quiescence, are mainly responsible for habitual abortion in the first few months of pregnancy. If a sustained nervous inhibition *is the means by which the pregnant* uterus is normally kept quiescent, rest should be the main therapeutic agent in these cases.

Mr. Cecil Binney, a barrister-at-law, brought his expert legal mind to bear on the subject of artificial insemination. He argued that artificial insemination with donated semen cannot be used as grounds for divorce, since it cannot be interpreted as an act of adultery. (Adultery is a sexual act, which has nothing to do with the conception of a child, and birth of a child without a sexual act can hardly be adultery.) Nor can artificial insemination be used as grounds for divorce in relation to nullity. On the other hand donor insemination introduces almost insuperable difficulties in conne with the law of inheritance of settled funds. In subsequent lively discussion on this, as on other aspects of insemination, the general view seemed to be that the practice should be left to somebody else.

The frequency with which pregnancy follows adoption of a child led to the suggestion that babies might be borrowed for the specific purpose of relaxing tension and stimulating mother-love. Fanciful though this may be, the meeting was left with the feeling that there are more things in heaven and earth than are dreamt of in our philosophy; members were reminded that in assessing results in the cure of infertility they must be humble, because nature herself so often cures without human aid.

Analgesia in Midwifery

Prof. W. C. Nixon opened the second discussion with an inspiring paper which went far beyond the consideration of particular analgesics or anæsthetics. He pointed out that the more complete the antenatal preparation of the patient, the more physiological her labour will be and the less pain she will have. The relief of pain in the labour ward should begin in the antenatal clinic. Confidence thus inspired in the patient goes a long way towards removing fear and inhibitions that ultimately impede the natural processes of childbirth. Professor Nixon spoke also of the need for sleep during labour, especially at the natural time for sleeping at night, and discussed the various drugs that might be used to promote it. He discouraged the use of barbiturates, but from further experience at University College Hospital he advised the use of pethidine in doses of 150 mg. At this hospital investigations are being carried out by a full-time research anæsthetist appointed to the obstetric department, and this is a development in hospital organisation that other units should pursue. Only if obstetricians and anæsthetists work together can satisfactory team-work be attained and the pati be legitimately relieved of unnecessary pain.

The next speakers were Dr. P. J. Helliwell and Dr. A. M. Hutton, both of whom are working with a research grant at Guy's Hospital. Reporting at some length on their investigations with 'Trilene' in midwifery they concluded that the danger of the self-administered trilene inhalers is by no means negligible, and that the patient should never be left alone with a self-administered trilene inhaler. The value of trilene in midwifery is nevertheless very considerable, and the general view is that it is the most useful supplement for gas-and-oxygen or gas-and-air. During the discussion chloroform received many bouquets from experienced and older practitioners, and caudal analgesia was mentioned as very valuable in carefully selected cases and in experienced hands.

The Third Stage and its Complications

The third stage of labour appropriately occupied the final stage of the section's meetings.

Mr. J. D. S. Flew put in a strong plea for the use of oxytocic drugs—ergometrine in particular—before the delivery of the placenta in cases of hæmorrhage. Considerable changes are nowadays being made in *management of the third stage*, both normal abnormal. In particular the older teaching of Cr expression and bimanual compression is now recognised as often dangerous and productive of shock. This a vitally important point, because midwives up and down the country are still being taught manual removal the conscious patient—a method which they would never carry out in practice—as well as Credé expression. Far less harm would be done if they were allowed to give an oxytocic drug to control immediate hæmorrhage. Later speakers all agreed with Mr. Flew in condemn the old-fashioned methods of expressing the placenta which can often far more safely be expressed from the

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This has happened after large sums of public money have been spent by the Government, through the Central Council for Health Education, in telling the public of the dangers of V.D., and in trying to conquer V.D. by fear and persuasion, coupled with treatment after the disease has developed. The public has not been allowed to learn the vitally important fact that a great deal of V.D. is easily prevented. This is a scientific fact and it has been known for 40 years.

During the great wars the fighting Services all over the world, owing mainly to the persistent efforts of this society, were protected (more or less, according to the enthusiasm of the officer-in-charge) against these diseases by the preventive measures we have advocated for thirty years. But the civilian population all the time has been kept in ignorance, and so V.D. is on the increase.

The statement by the Government-appointed Trevethin Committee (1922) that "properly and promptly applied disinfection . . . would almost certainly prove effectual" has been ignored, and up to the present no Government has had the courage to translate these findings into action. It has been left to us, a voluntarily supported society, to work alone. And we have to fight not only disease, but very often violent prejudice as well.

Our policy is threefold: (1) to educate the public with regard to the fact that V.D. can be prevented by simple, scientific measures; (2) to supply all interested persons with details of such measures; and (3) to secure the necessary alteration of the law to enable the preventive materials to be sold together with the necessary instructions. This society cordially supports any and every method whereby V.D. may be combated, but it is confident that V.D. will be eliminated only by practical prevention. Without practical prevention any campaign against V.D. is doomed to failure.

About 100,000 men and women sufferers from V.D. will be treated at clinics this year, and there will be a great number of infected persons who will not go to clinics.

We are planning a great campaign to set the people free from V.D. and from the prejudiced tyranny that has kept them in ignorance of the facts. The scope and magnitude of this great attack depends upon the support we receive from the profession and from the general public. Let us show you how you can help.

HORDER
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CONTROL IN SCHICK-TESTING

SIR,—Last year you published some of my original findings on the properties of Holt's diphtheria toxoid (P.T.A.P.).[1] Since then I have encountered an unexpected difficulty, which I feel ought to be communicated to other workers.

For many years it has been assumed that infants and children under five years of age very rarely indeed become sensitive to the protein substances present in diphtheria prophylactics. It was believed, and rightly so, that if a control injection were used in post-Schick tests in infants, it practically never revealed any acquired protein sensitivity. Consequently it was considered quite sound practice to dispense with the control injection in infants and very young children, reserving it for use in the over-fives.

In the course of investigating various experimental samples of Holt's P.T.A.P., I recently became disturbed at the number of faintly positive post-Schick readings I was obtaining in very young children. The number was not large but was beyond my expectations, and I became suspicious. From that moment I readopted the use of the control injection and found that most of the cases that I had been obliged to regard as feebly positive were, in fact, pseudo and negative. The

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I realise that these lectures fulfil a purpose, if only to express the colleges' appreciation of the status and reputation of their selections. Moreover, there is often a desire on the part of those attending to indicate a personal regard for a lecturer, who will interpret one's attendance as a compliment. But excluding sentiment and considering the essentially practical point of view, I have usually found it sheer waste of time.

In nearly all instances page after page of manuscript is read out, often inaudibly, generally monotonously, and almost invariably too rapidly in an obvious anxiety to cover the whole of the ground in the allotted time. All that results is a blurred sensation with occasional perception of technical details, and I believe most of the audience hypnotise themselves into a state of self-deception although hearing little and understanding less.

It seems to me that the lecturer should prepare a special sort of abstract, summary, abridgment, synopsis, or whatever is the proper description, which could really *be delivered as a lecture to give a readily* comprehended impression, and that he should not attempt anything more elaborate. The address in its entirety would then appear in one of the journals where it could be studied with the care essential for proper understanding.

I do not anticipate an enthusiastic reception of this idea, but from my considerable experience as a lecturee I feel sure I am right.

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It may hearten you in England to know that we in Indiana, U.S.A., think of you more often than either of us realise. The other morning (2 A.M.) I telephoned the telegraph office. In giving my message, for sake of clarity I pronounced "laboratory" as you do, instead of as we do with the emphasis on the "lab" and the rest slithering away back into the nasopharynx. To my delight the elderly male voice at the other end of the line remarked, "That's the English way, isn't it, sir? That's how Sherlock Holmes pronounced it."

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Letters to the Editor

REPRESENTATION OF SPECIALISTS

SIR,—But for the promise of an Amending Act the present state of the profession would be chaotic: as it is, we wait anxiously to see the effect on general practitioners of the terms which many of them have accepted. Some of us feel that a better service could have been obtained by a wiser policy and better negotiators. To consultants feeling so, the British Medical Association's new plan for organising us does not come with good testimonials, and examination increases uneasiness.

Satisfactory representation for general practitioners should have been easily obtained: they are relatively evenly dispersed, their work is uniform in character, and all that is needed is geographical division. But representation of specialists and consultants is very different. These gather essentially in centres with high standards; the wisdom of a few men of world-wide repute in teaching hospitals can outweigh that of many elsewhere. Moreover, not only are they thus irregularly dispersed, but they are not interchangeable as are the general practitioners; a surgeon cannot change suddenly to psychiatry or a physician to otorhinolaryngology. The problem of representation is so different that the machinery cannot be the same. For this reason the original B.M.A. plan seemed far from being in the best interests of the profession, especially if non-teaching hospitals could outvote the teaching hospitals by as much as 9 to 1. Although such criticism was at first termed an abandonment of democracy, the B.M.A. itself hastened to recommend that the representation of the two types of hospital in a region should be equalised, and each region send to a central committee 1 member from the teaching and 1 from the non-teaching hospitals.

This does indeed abandon democracy, but only if democracy means making the interest of the individual consultant more important than the interest of his specialty. It leads, more seriously, to an arrangement by which regions will send to a central committee an entirely fortuitous collection of physicians, surgeons, and obstetricians and gynæcologists. There are no means by which this central committee can provide for itself the very necessary correct proportion of representatives of the three supremely important branches of medicine which every physician, surgeon, or gynæcologist would wish to see. This is not an academic question: the method of committee formation suggested by the B.M.A. has been tried in at least one hospital region and found unsatisfactory, and representation must be by specialties properly balanced if committees are to do their work as it needs to be done. When this balance is a matter of chance, and when the committee itself has as many as 72 members, the usefulness of the scheme is very doubtful indeed and its value for negotiation appears negligible, if it is not actually harmful. Indeed non-teaching consultants have already been well treated; they are recognised by the Spens report and the Minister as the financial equals of their metropolitan colleagues. But this does not make them equal in other ways. Such recognition should be regarded as a trust, which they must fulfil that in time they will make their individual and institutional work equal too. The opportunity was won for them very largely indeed through the efforts of college representatives. Would it not be wise for them to return the trust, and believe that through the colleges they will find representatives who will obtain for them *other advantages such as those they already owe*—the Amending Act and the Spens report?

Hove, Sussex. **W. A. BOURNE.**

p-AMINOSALICYLIC ACID IN TUBERCULOSIS

SIR,—Since the publication of my first report[1] on the systemic treatment of pulmonary tuberculosis with *p*-aminosalicylic acid (P.A.S.), commercial production of the drug has started; and though still very scarce it is now available for clinical work. It may therefore be useful to summarise the experience gained in the first six months of trial and error.

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[1] *Lancet*, 1948, i, 791.

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REPRESENTATION OF SPECIALISTS

SIR,—But for the promise of an Amending Act present state of the profession would be chaotic: [illegible] is, we wait anxiously to see the effect on general practitioners of the terms which many of them have accepted. Some of us feel that a better service could have been obtained by a wiser policy and better negotiators. To consultants feeling so, the British Medical Association's new plan for organising us does not come with good testimonials, and examination increases uneasiness.

Satisfactory representation for general practitioners should have been easily obtained: they are relatively evenly dispersed, their work is uniform in character, and all that is needed is geographical division. But representation of specialists and consultants is very different. These gather essentially in centres with high standards; the wisdom of a few men of world-wide repute in teaching hospitals can outweigh that of many elsewhere. Moreover, not only are they thus irregularly dispersed, but they are not interchangeable as are the general practitioners; a surgeon cannot change suddenly to psychiatry or a physician to otorhinolaryngology. The problem of representation is so different that the machinery cannot be the same. For this reason the original B.M.A. plan seemed far from being in the best interests of the profession, especially if non-teaching hospitals could outvote the teaching hospitals by as much as 9 to 1. Although such criticism was at first termed an abandonment of democracy, the B.M.A. itself hastened to recommend that the representation of the two types of hospital in a region should be equalised, and each region send to a central committee 1 member from the teaching and 1 from the non-teaching hospitals.

This does indeed abandon democracy, but only if democracy means making the interest of the individual consultant more important than the interest of his specialty. It leads, more seriously, to an arrangement by which regions will send to a central committee an entirely fortuitous collection of physicians, surgeons, and obstetricians and gynæcologists. There are no means by which this central committee can provide for itself the very necessary correct proportion of representatives of the three supremely important branches of medicine which every physician, surgeon, or gynæcologist would wish to see. This is not an academic question; the method of committee formation suggested by the B.M.A. has been tried in at least one hospital region and found unsatisfactory, and representation must be by specialties properly balanced if committees are to do their work as it needs to be done. When this balance is a matter of chance, and when the committee itself has as many as 72 members, the usefulness of the scheme is very doubtful indeed and its value for negotiation appears negligible, if it is not actually harmful. Indeed non-teaching consultants have already been well treated; they are recognised by the Spens report and the Minister as the financial equals of their metropolitan colleagues. But this does not make them equal in other ways. Such recognition should be regarded as a trust, which they must fulfil that in time they will make their individual and institutional work equal too. The opportunity was won for them very largely indeed through the efforts of college representatives. Would it not be wise for them to return the trust, and believe that through the colleges they will find representatives who will obtain for them other advantages such as those they already owe—the Amending Act and the Spens report?

Hove, Sussex. W. A. BOURNE.

p-AMINOSALICYLIC ACID IN TUBERCULOSIS

SIR,—Since the publication of my first report[1] on the systemic treatment of pulmonary tuberculosis with p-aminosalicylic acid (P.A.S.), commercial production of the drug has started; and though still very scarce it is now available for clinical work. It may therefore be useful to summarise the experience gained in the first six months of trial and error.

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[1] *Lancet*, 1948, i, 701.

e patients have completed 4-month courses, and nber of others courses of up to 4–5 weeks. In each e five cases which have received 4-month courses mount given was 12–14 g. daily, in seven doses rly with one interval of 6 hours at night. In all em further progress of the disease has been checked, gh complete cure can be claimed in none. With exception (case 4) the patients had the rapidly essive, exudative form of the disease. They were ely toxic, with swinging temperature, high blood-nentation rate, and sputum loaded with tubercle li; and monthly radiological examination had aled continuing spread despite absolute bed rest and ther therapeutic measures except streptomycin.

e considerable improvement in general condition, eased appetite, gain in weight, and loss of toxicity been well maintained in all these cases, 4 weeks after completion of the course. The temperature has also ained normal, except in case 2 where the curve tended reep up after completion of the first 8-week course; a pause of 4 weeks had to be interposed owing to ply difficulties, and the second 8-week course did completely suppress the pyrexia. But even in this the improvement in general condition and X-ray earances has been maintained. In the other cases the ay appearances present a picture as hopeful as the ical aspect. In all, progress of the disease has been cked: the soft mottling has disappeared, and there pronounced hardening of the major lesions with re-or-less definite fibrosis.

No true sputum conversion could be demonstrated any of these cases, though the bacilli have become y scanty and have commonly been absent from the ekly specimens for 6–8 weeks. The strain cultured h *p*-aminobenzoic acid added shows no increased sitivity for P.A.S. against the HR 37; this conforms h Davis's[2] observations.

Regarding laboratory findings, blood P.A.S. levels of 8 mg. per 100 ml. have been uniformly reached after g., and up to 11 mg. per 100 ml. has been reached er 3 g.: the blood-level sinks rapidly below 3 mg. r 100 ml. after 3 hours. The urinary concentration also fairly constant at 45–50 mg. per 100 ml. It is timated that about half the P.A.S. is excreted as such the urine, from which the drug disappears within hours of discontinuing intake. The concentration the sputum varies from 1 to 5 mg. per 100 ml.; a gher concentration is apparently present in purulent an in mucous sputum.

No real toxic manifestations have been observed at ily doses of up to 25 g.; but in a few instances nausea d even vomiting have set in, perhaps because the lution was given without sufficient dilution, or because was not suitably flavoured. With attention to these oints, the symptoms have always disappeared. Even nall doses of aspirin inadvertently given may, however, recipitate symptoms of severe salicylate poisoning.

In all cases where P.A.S. has been tried the picture as followed the same pattern—loss of toxicity, control f pyrexia and cough, increased appetite, and gain in eight. Some of the patients are now fit for surgical eatment. The remainder, unsuitable for surgery, will on present the problem of what is to be done with them. ill they get along as inactive open cases, or will further ourses of P.A.S. be needed to ensure a reasonable span f life? I feel that in earlier cases, with less gross estruction of the lung, P.A.S. may well afford a complete ure. It also seems that the daily dose must be greatly creased—to not less than 20–25 g.—and must be ontinued for at least 3 months if better results are to e achieved. Local treatment with 1–2% spray should lso be included. Probably a P.A.S. "umbrella" will educe the risk of spread or reactivation through operaion or during pregnancy. It thus seems that P.A.S. nay be regarded as the beginning of an answer to the roblem of tuberculosis; but new and more promising ompounds are already emerging from the laboratories.

I am grateful to Dr. W. E. Snell for facilities at Colindale Hospital, and to Dr. George Day and Dr. E. C. Wynne-Edwards for similar courtesy at Mundesley Sanatorium. am also indebted to Messrs Ward, Blenkinsop & Co. Ltd., or free supplies of P.A.S.

London, S.W. **A. ERDEI.**

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2. Davis, H. *Mon. Bull. Min. Hlth, P.H.L.S.* 1948, 7, 109.

NATIONAL SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE

SIR,—The latest report of the Ministry of Health has to acknowledge an alarming setback in venereal disease that has dismayed everyone who understands its significance. The report says: "During the year 1945 the incidence of syphilis and gonorrhœa increased appreciably."

This has happened after large sums of public money have been spent by the Government through the Central Council for Health Education, in telling the public of the dangers of V.D., and in trying to conquer V.D. by fear and persuasion, coupled with treatment after the disease has developed. The public has not been allowed to learn the vitally important fact that a great deal of V.D. is easily prevented. This is a scientific fact and it has been known for 40 years.

During the great wars the fighting Services all over the world, owing mainly to the persistent efforts of this society, were protected (more or less, according to the enthusiasm of the officer-in-charge) against these diseases by the preventive measures we have advocated for thirty years. But the civilian population all the time has been kept in ignorance, and so V.D. is on the increase.

The statement by the Government-appointed Trevethin Committee (1922) that "properly and promptly applied disinfection . . . would almost certainly prove effectual" has been ignored, and up to the present no Government has had the courage to translate these findings into action. It has been left to us, a voluntarily supported society, to work alone. And we have to fight not only disease, but very often violent prejudice as well.

Our policy is threefold: (1) to educate the public with regard to the fact that V.D. can be prevented by simple, scientific measures; (2) to supply all interested persons with details of such measures; and (3) to secure the necessary alteration of the law to enable the preventive materials to be sold together with the necessary instructions. This society cordially supports any and every method whereby V.D. may be combated, but it is confident that V.D. will be eliminated only by practical prevention. Without practical prevention any campaign against V.D. is doomed to failure.

About 100,000 men and women sufferers from V.D. will be treated at clinics this year, and there will be a great number of infected persons who will not go to clinics.

We are planning a great campaign to set the people free from V.D. and from the prejudiced tyranny that has kept them in ignorance of the facts. The scope and magnitude of this great attack depends upon the support we receive from the profession and from the general public. Let us show you how you can help.

HORDER
President, National Society
for the Prevention of Venereal Disease.

47, Nottingham Place, London, W.1.

CONTROL IN SCHICK-TESTING

SIR,—Last year you published some of my original findings on the properties of Holt's diphtheria toxoid (P.T.A.P.).[1] Since then I have encountered an unexpected difficulty, which I feel ought to be communicated to other workers.

For many years it has been assumed that infants and children under five years of age very rarely indeed become sensitive to the protein substances present in diphtheria prophylactics. It was believed, and rightly so, that if a control injection were used in post-Schick tests in infants, it practically never revealed any acquired protein sensitivity. Consequently it was considered quite sound practice to dispense with the control injection in infants and very young children, reserving it for use in the over-fives.

In the course of investigating various experimental samples of Holt's P.T.A.P., I recently became disturbed at the number of faintly positive post-Schick readings I was obtaining in very young children. The number was not large but was beyond my expectations, and I became suspicious. From that moment I readopted the use of the control injection and found that most of the cases that I had been obliged to regard as feebly positive were, in fact, pseudo and negative. The

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1. *Lancet*, 1947, i, 286; *Ibid*, ii, 867.

danger is that these readings, which proved to be so tricky without the use of control, were not like typical fading pseudo-reactions; they were too circumscribed and their colour was too uniformly even. Yet against the control solution they proved to be pseudo-reactions.

It is somewhat humiliating, after all these years, to realise that one can be caught napping by a quite atypical form of pseudo and negative reaction; but my experience may serve as a warning to others.

I do not think that the value of my comparative experiments (already published) is likely to be in any way invalidated, as the pseudo error (not large) is applicable to all the groups which were under consideration. But for those desirous of finding out whether the powerful modern prophylactics are yielding a 95% or a 99% conversion-rate, I cannot too strongly emphasise the necessity of using the control in all post-Schick tests.

I have, as always, used the Wellcome brand of toxin and control in this investigation.

London, S.E.5. GUY BOUSFIELD.

HEXOBARBITONE AND TUBARINE

SIR,—An excessive amount of abdominal pain has been experienced by some patients when first regaining consciousness after an abdominal operation under light anæsthesia and relaxation with 'Tubarine.' I attributed this to:

1. Early restoration of consciousness and body function *per se* as compared with other methods of anæsthesia, allowing immediate postoperative abdominal discomfort to be experienced at all.
2. The variable, but, I think, often excessive contraction of the gut following administration of tubarine. Gray and Halton[1] comment on this and also show clearly the synergism that exists between curariform drugs and barbiturates.

It occurred to me, therefore, to try going back to the use of hexobarbitone because of its more prolonged action, and particularly because of its pleasant postoperative effect of sustaining a light sleep for some hours. This change has been justified by results. Relaxation during operation has been prolonged and sustained up to one hour and less cyclopropane has been required; but the chief benefit has been the postoperative comfort of the patient, who, having experienced much less pain, gets a pleasant sleep until the effects of the operation have worn off. I also think there is less intestinal contraction. HUGH D. BROWNE.

Memorial Hospital, Haywards Heath.

APPARENT ACUTE GLOMERULONEPHRITIS WITHOUT ALBUMINURIA

SIR,—The syndrome described last week by Dr. Crofton and Dr. Truelove vividly recalls to my memory experiences which during the first world war were puzzling many clinicians in Central Europe.

Many victims of the so-called *Kriegsnephritis* had died of acute œdema of the lungs before admission to hospital because, in view of the absence of albuminuria, the combination of generalised œdema and bradycardia had led the doctors on the front to the erroneous diagnosis of *Kriegsœdema*. Unfortunately the leading symptom of severe dyspnœa was overlooked. I saw many cases of analbuminuric acute glomerulonephritis at Wenckebach's First University Clinic in Vienna during 1917 and 1918. Apart from albuminuria they presented the full picture of acute glomerulonephritis—i.e., severe hypertension, œdema, and bradycardia. The skin capillaries revealed dermatoscopically the characteristic picture which I described in 1920.[2] The most striking sign, however, was acute or subacute œdema of the lungs, which was invariably present and was demonstrated by the cloudy appearance of the lung fields on screening. Under the then-prevalent Volhard's "fast-and-thirst" régime the majority of cases recovered, albuminuria appearing on the third or fourth day. Necropsy of patients who had died of acute left ventricular failure showed typical acute glomerulitis with all histological details.

The syndrome should preferably be termed "analbuminuric stage of acute diffuse glomerulonephritis" since albuminuria eventually appears after a few unless the patient succumbs to acute œdema of lungs. It may be added that routine blood-p readings in patients with scarlatina often reveal a in blood-pressure before albuminuria attracts atten to the kidneys—a point of great interest in pathogenesis of acute diffuse glomerulonephritis

Nuneaton. LEO HAHN

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[1] Gray, T. C., Halton, J. *Proc. R. Soc. Med.* 1946, 39, 400.

[2] Hahn, L. *Med. Klin.* 1920, no. 40, p. 1039.

A TAX ON KNOWLEDGE

SIR,—Is there not an analogy with the legal profe as regards the use of books by doctors (referred to in your leading article last week)? The position in re of income-tax is controlled by a decision by Mr. Justi Rowlatt (Daphne *v.* Shaw [1926] 43 T.L.R. 45) in whic he "was unable to say that the books of a solicitor o of a barrister or of a judge which were used in the se of being consulted were plant." Discussing this poi the *Solicitor* (September, 1947, p. 195) observed:

> "That bases the decision, as it must be based, upon the actual words of the statute, which are really inapplicable t the occupation of a solicitor. Apparently some inspector of taxes have taken a more practical view of the pres conditions and have allowed members of the Bar an allowan for their books. Writers, too, receive an allowance for book purchased to meet the requirements of their work."

It seemed to the *Solicitor*, however, as if in the long ru an amendment of the law may be necessary, and attentio was drawn to the Australian Income-Tax Acts in which an allowance for libraries has definite recognition.

C. E. A. B.

POSTURE AND PRESSURE

SIR,—Your annotation of June 26 states that more than fifty years ago I demonstrated that four-legged animals would die from cerebral anæmia if kept upright for a few days. This is not correct. What I found wa that big-bellied hutch rabbits when suspended, stretched out, in the vertical, head-up position quickly fainted from the blood sinking into the abdomen, and were a once restored by a bandage drawn round this. Th bellied wild rabbits did not faint. I also showed International Physiological Congress at the Cambri meeting, held so long ago, that when a snake was fixed a board, drawn out full length, and put in the vert position the blood ceased to fill the heart, standing the veins just below it. On sinking the board and anim in a tall cylinder of water the heart filled, the pres of water outside balancing that of the blood in th animal.

Smallfield, Surrey. LEONARD HILL

SIR,—Hill[1] did not show that the upright positi would kill four-legged animals in "a few days," h referred to Solathé[2] who found that in the vertical fe down position rabbits died in the course of 15 minutes 2 hours.

The effect of change of posture on the blood-pressure has been investigated many times. The largest se of controlled observations is that of Schneider and Truesdell,[3] who reported results in 2000 normal adults They found that there was a wide variation in the indi vidual response. The pulse change on standing varie from a slowing by 15 beats per min. to an increase o 57 beats. In over 84% of cases, there was an increa of up to 30 beats. When the results were plotted a histogram, a typical frequency distribution cu resulted. A similar variation was noted in the chan in blood-pressure. This variation is what would expected of biological observations and was recorde Hill and Barnard[4] in dogs. The changes are neces for two reasons: (1) the fall in cardiac output t takes place in the upright position, and (2) the cha in the relative positions of the heart and the In the erect position energy has to be expended to the blood from the level of the heart to that of the br The adjustment is a nervous one mediated by the caro sinus mechanism, and if both carotid sinuses in m are denervated the mechanism fails and postu hypotension results.[5]

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[1] Hill, L. *J. Physiol.* 1895, 18, 15.

[2] Solathé (1877) quoted by Hill.

[3] Schneider, E. C., Truesdell, D. *Amer. J. Physiol.* 1922, 61, 4

[4] Hill, L., Barnard, H. *J. Physiol.* 1897, 21, 324.

[5] Capps, R. B., de Takats, G. *J. clin. Invest.* 1938, 17, 385.

t has been shown by Pickering, Kissin, and Roth- ild[6] that in human hypertension the carotid sinus ctions normally, and that the hypertension differs m that produced experimentally by denervating the otid sinuses and aorta. It is therefore unlikely that ervations on the effects of a nervous reflex concerned h compensation for postural change would provide guide to the chances of an individual developing pertension.

To regard a rise of 4 mm. Hg in the diastolic pressure significant is arbitrary and unjustified. Schneider and uesdell found the average rise in diastolic pressure standing in their series of 2000 normal adults to be mm. Hg.

D. VÉREL.

Department of Medicine, University of Aberdeen.

PILONIDAL SINUS IN A BARBER'S HAND

SIR,—I should like to record a case similar to those scribed by Ewing[7] and by Patey and Scarff.[8]

In 1941 a barber presented himself with an abscess in e web between the middle and ring fingers of his left hand. maintained that this was due to penetration by the ort cut hairs, and that this was the third time a suppurative ocess had developed at that site. On incision pus and umerous short hair clippings discharged.

This patient was in the habit of running his fingers rough his clients' hair and supporting it thus while ing the scissors. It was during this procedure that the ir clippings reached the web.

Edinburgh.

GODFREY B. TAIT.

SIR,—Some time ago I saw what must have been a milar case to those described by Mr. Patey and rofessor Scarff.

I was having my hair cut, and in the course of conversation e barber mentioned that he was having trouble with hair netrating the web of his fingers. Asking if I would like have a look, he stripped off some plaster and proffered s hand for inspection. There, between the thumb and refinger of his cutting hand, was a little tuft of hair pro- uding from the web. The longest of the hairs penetrated raight in to a depth of about $^1/_4$ in. There was no sign inflammation round the tiny hole in the skin; nor was ere any induration along the track of the hairs. This d towards a swelling deep in the web which was the size a small pea, cystic and painless; I assumed it was an plantation dermoid.

The barber, telling me his doctor was going to " open ," resumed his cutting while I pondered on how the ir got in.

London, W.11.

J. M. WILKS.

SIR,—Patey and Scarff have drawn attention to an teresting occupational condition. I met with a milar case in the casualty department of the Royal orthern Hospital in 1939.

The man, a barber by trade, presented with a discharging scess in the cleft between the ring and middle fingers of e left hand. Projecting from the discharging sinus were merous hairs, of all different colours and lengths. The ainage was improved by a surgical incision, and a great any more hairs were found on laying open a chronic abscess vity. As I had not met the condition before I questioned e patient, who informed me that it was a not uncommon ndition amongst his fellow-craftsmen. I instructed him look out for other such cases and refer them to me. fortunately no such patients reported.

e ætiology of such a condition is best explained in e simplest terms. The hairs in this case were all oderately short and fairly bristly, although differing ghtly in texture and widely in colour. The lesion s situated in the cleft where the barber constantly dged his comb while using the scissors with his right nd, and it would seem probable that this played some rt in driving the short stiff hairs into the soft skin of the web. The site of the lesion was the same in all cases recorded, with the exception of the first reported by Patey and Scarff (1946). In Ewing's case it was in the corresponding cleft of the right hand. It would be interesting to know whether this man was left-handed and lodged his comb in that cleft. An alternative explanation might be that pressure resulted from the way a barber palms his scissors, using the thumb and ring finger. Further evidence of the power of hair clippings to penetrate skin and cause infection is the common occurrence of acute and chronic paronychia with foreign hair found to be in lodgment—a condition which I have seen on numerous occasions.

There is little support for the suggestion made by the authors that herein lies an explanation of the hair found in a pilonidal cyst (postanal dermoid, anococcygeal cyst). Admittedly this condition is one commonly found in men, especially of the hirsute type. On the other hand, many people have congenital sinuses and cysts which do not contain hair, merely because they are not formed in that hairy type of person. Routine examination of the natal cleft of all types of persons reveals a surprisingly high incidence of minute pits in and about the midline over the coccygeal region. Many give a history of one or more transient attacks of pain and inflammation that have often resolved with conservative measures. There is a satisfactory embryological explanation of such lesions.[9] When hair is found in a sinus or lesion of this sort, it is always long and fine and tapering at the end, and not of a type that is likely to penetrate. The possibility of its being " sucked in," suggested by the authors, is difficult to accept.

St. Mary's Hospital, London, W.2.

C. PATRICK SAMES.

PAIN

SIR,—In his interesting article in your issue of July 3, Dr. Keele describes a case which, he considers, illustrates " the characteristic features of psychogenic pain." These he enumerates as: (1) irregularity of occurrence, with absence of evidence of organic disease; (2) response on several occasions to a placebo such as distilled water; and (3) irregular response to potent analgesics. But do these criteria provide sufficient foundation upon which to base such an important decision? Absence of evidence of organic disease actually affords no ground for regarding a pain as psychogenic, and diagnosis by subterfuge such as injection of distilled water is both outmoded and notoriously unreliable. Later in the article Dr. Keele himself writes that there has been a remarkable tendency to ignore the factor of suggestion in assessing many medical and surgical pain-relieving procedures, and with this I would heartily agree. Pains of organic origin not infrequently respond to suggestion, including injections of distilled water, more readily than so-called psychogenic pains, and this is sometimes a serious source of error.

Decision that a symptom is psychogenic is justified only on positive as well as negative grounds. Apart from absence of organic findings, there must be established some positive psychogenic basis. Further, the psychogenic factors must bear direct relation to the patient's symptoms for which the psychogenesis furnishes a purpose, however unconscious, irrational, and primitive. Thirdly, it is unwise to diagnose psychoneurosis in the absence of a history of previous neurotic trends. Additional evidence of psychogenesis may be afforded by an organically inexplicable mobility and ubiquity of the symptom. Variation in accordance with environmental circumstances that are likely to have an emotional, as distinct from a purely physical, influence may confirm. Finally, an early, progressive, and satisfactory response of the ailment to psychotherapy may clinch the diagnosis.

Must the distilled-water test be perpetuated as a diagnostic refuge for one more generation of housemen and students? A patient who complains, no matter how, as it may seem, exaggeratedly or unreasonably, of severe pain persisting or constantly recurring in the same site must be taken very seriously until the positive explanation of that pain is ascertained; and this even though his manner may suggest a wish to impress, perhaps to the point of deception, the severity of his pain on the

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Pickering, G. W., Kissin, M., Rothschild, P. *Clin. Sci.* 1936, 2, 193.

Ewing, M. R. *Lancet*, 1947, i, 427.

Patey, D. H., Scarff, R. W. *Ibid*, 1946, ii, 484; *Ibid*, July 3, p. 13.

[9] Bland-Sutton, J. Tumours Innocent and Malignant. 7th ed., 1922; p. 532.

Unfortunately the experience of welfare officers indicates that, once the parties have found themselves at arm's length in the law-courts, the chance of reconciliation deteriorates.

Parliament

Medical Services in the Colonies

OPENING a debate on colonial affairs in the House of Commons on July 8, Mr. CREECH JONES, secretary of state for the colonies, said that during the past year there had been substantial developments in social policy. Universities were coming into being in the West Indies, in West Africa, and in Malaya, and the status of Makerere was being changed to that of a university college. Campaigns had been conducted with great success against pests and locusts in Africa; there had been campaigns against diseases of all kinds; the working unit in Gambia had been doing very good work in the field of nutrition. A panel had been set up for improving the medical services by the sending of consultants from this country to examine medical arrangements and work in conjunction with the medical services in Africa, and a vigorous housing and welfare policy had been pursued in the various territories. We were in these territories to guide them as quickly as circumstances permitted to responsible government within the Commonwealth, in conditions which ensured to the peoples fair standards of living and freedom from oppression from any quarter.

During the past year an endeavour had been made to secure a genuine measure of international coöperation in wide areas in regard to some of the problems of Colonial development. There had been a series of conferences with the French, Belgian, and Portuguese governments, which have given willing coöperation.

Dr. HADEN GUEST said that Africa was probably on the eve of a great increase in population such as happened in Britain about 150 years ago at the time of the Industrial Revolution. The director-general of medical services in Kenya had drawn attention to the fact that under existing circumstances the increased population could not be fed. He had said that unless changes were made we should be left with pestilence or war as remedies for over-population and starvation. Dr. Haden Guest suggested that these facts should be taken into consideration. He had seen in South Africa the complete demoralisation of African life created by industrial conditions. To a very large extent land in tropical Africa was still under some form of communal ownership. We ought to keep the majority of Africans on the land and improve their conditions and amenities while adding secondary industries.

Mr. A. M. SKEFFINGTON held that there were not enough European doctors and medical assistants. He hoped that ways would be found of extending medical training for Africans.

Replying to the debate Mr. D. R. REES-WILLIAMS, under-secretary of state for the colonies, said that the campaign against the tsetse fly was still only in the planning stage. A team in West Africa was trying out the effect of aircraft spraying. In addition the authorities were trying the old methods of bush clearance, research on the type of bush that the tsetse fed upon, and other approaches. There was a new drug called 7555, of which they were not as yet quite confident; it was still undergoing its field tests. Locusts, which were one of the age-old enemies of mankind, had been brought under control at some expense to the British taxpayer, and with international coöperation. A new serum was believed to render cattle immune to rinderpest.

QUESTION TIME

Professional Secrecy

IN the House of Lords Lord BALFOUR OF BURLEIGH asked H.M. Government to state precisely the nature of the difficulty in administering the venereal diseases Acts and regulations which had led to the withdrawal of the statutory protection of secrecy from persons receiving treatment at V.D. clinics, and to state whether it was contemplated that in future information as to attendance or non-attend V.D. clinics, or factual information as to the state of of persons receiving treatment, would in any circum be able to be communicated to the police by the officer of health or by a member of the V.D. services, and ask H.M. Government to state the number of cases in compulsory medical examination took place under Re 33B now repealed, and the number of cases (men and w separately) in which the persons examined were found to suffering from venereal disease.—Lord LISTOWEL repl The withdrawal of the provision simply results from revoking of the Public Health (Venereal Diseases) Regula of 1916. These regulations placed upon local autho the responsibility for the treatment of venereal diseases a have been revoked because this responsibility now devolv upon regional hospital boards under the National Hea Service Act. It no longer appears necessary to contin special statutory provision to the effect that treatment f venereal diseases shall be regarded as confidential. Th maintenance of secrecy does not primarily depend for its fo on any statutory provision but rather on the proper a normal relationship between doctor and patient. There i no reason whatever to apprehend that the confidential natu of venereal disease treatment will not continue to be as clos preserved as it always has been. The number of cases i which compulsory medical examination took place unde Regulation 33B was 13 men and 1116 women. Informati about how many of these were found to have venereal disea is not available.

In the House of Commons Sir ERNEST GRAHAM-LITTL asked the Secretary of State for Air whether he was aware that at a conference of A.O.C.'s held in November, 1947, at an R.A.F. unit in Germany attended by all doctors, padres, and commanding officers of the wing, M.O.'s were reminded that a long-standing regulation required them to divulge to the commanding officer the names and full medical details of patients under their professional care suffering from venere disease, these records being accessible to other persons th the C.O.; that, as these requirements constituted a brea of the obligation binding members of the medical profe not to divulge to third persons information received in th professional capacity, several medical officers present at t conference expressed reluctance to obey the regula and if he would consider its withdrawal.—Mr. A HENDERSON replied: The officers who attended this confere were reminded of a King's Regulation which requires a d sick return, showing the diagnosis and disposal of each c to be made to the commanding officer. I am aware t at the conference some misgivings were expressed a the regulation, which is, however, necessary to enable commanding officer to carry out his duties in regard to t health and welfare of his unit. The situation in the R.A is not analogous with that in civil life. A commanding offi is responsible for the health of his men and for reducing th risk of infection. He must therefore be made aware of ca of venereal disease in his unit. In the circumstances, I cann agree to the suggestion that this regulation should be withdrawn.

Suspension of Tuberculous Teachers

Mr. ANTHONY GREENWOOD asked the Minister of Educati (1) whether he had now reminded education authorities the standing instructions issued by the Ministry of He and his department that a teacher found to be suffering f active tuberculosis should be suspended from teaching (2) whether he had considered the desirability of mak compulsory for all teachers to have a regular medical ove in order to ensure that they were not carriers of tubercu and what decision he had reached.—Mr. G. TOMLINSON re I am sending my hon. friend a copy of a memorandum has been issued reminding education authorities of the to be taken when a teacher is found to be suffering from tuberculosis. The memorandum does not require teach be medically examined at regular intervals after their into teaching service.

Mr. GREENWOOD: Would my right hon. friend bear mind that it is extremely dangerous to rely on a med inspection which may have taken place 15, 20, or 25 y earlier, probably without the assistance of radiography, how does he propose to make his answer effective with regular medical inspections?

Mr. TOMLINSON: My hon friend will see from the me randum that I am suggesting that greater use might be ss radiography. But compulsion is a question, I think, would need to be very carefully considered.

SOMERVILLE HASTINGS: Could not more be done to rage teachers to have examinations by mass radiography five or ten years?

TOMLINSON: I think that question is raised in the randum.

RANKIN: Would my right hon. friend extend that idea ctors, nurses, milk attendants, and all other people who close contact with children?

further reply was given.

Dentists and the National Health Service

D. L. LIPSON asked the Minister of Health whether, in of the large number of dentists who had decided not e part in the General Dental Service under the National h Act, he would invite the Dental Consultative Com- e to meet him again in order to try and find agreement utstanding differences.—Mr. ANEURIN BEVAN replied: Sir. The terms of service offered to dentists are in my generous and reasonable and I believe that most indi- l dentists will feel the same.

. LIPSON: May I ask my right hon. friend whether, in of the happy result which followed the gesture to the ors, he will now make a similar gesture to the dentists, s to ensure that the benefits of the dental part of the th service reach the people at the earliest possible time?

r. BEVAN: I am convinced from the figures of the dentists ng up, that very soon almost all the dentists will be taking ice under the Act. In any case, we cannot submit to t may become, unless we are careful, blackmail.

Capitation Fee to Medical Practitioners

r HENRY MORRIS-JONES asked the Minister of Health the amount of the capitation fee to medical practitioners er the National Health Act would be arrived at; what actions came out of the 15*s*. 6*d*. per head; and how the unt for each area would be computed having regard to proportion of the population who had not selected a or.—Mr. BEVAN replied: Detailed arrangements are still er discussion with the British Medical Association.

r H. MORRIS-JONES: Is the right hon. gentleman aware a large number of general medical practitioners are very urbed about this; that there is grave fear that their l emoluments and income will be considerably reduced r pre-National Insurance income; and that they want now whether the total pool will be available to them?

r. BEVAN: I think they ought to await the results of discussions with the representatives of the medical fession.

tra Members of Regional Boards, Management Committees, and Group Hospital Boards

ir IAN FRASER asked the Minister of Health if Regional Group Hospital Boards had power to co-opt a limited nber of extra members.—Mr. BEVAN replied: No, Sir; Regional Hospital Boards, Hospital Management Com- tees and Boards of Governors of teaching hospitals e power to appoint committees and subcommittees sisting partly of outside members and to delegate functions hem.

ir I. FRASER: Is it not inevitable when these committees first set up that certain local interests, such as hospital rds and ex-Servicemen, and others, will be left out; would it not give great public satisfaction if there were, a 10 per cent margin for co-option? Mr. BEVAN: The l management committees and regional boards have power o-opt people on to the subcommittees, and also on to the se-committees of individual hospitals. I believe that will done on a very considerable scale.

Specimen Diets for Duodenal Sufferers

r. EDWARD EVANS asked the Minister of Food, whether would issue in addition to the specimen menus published he press, dishes suitable for sufferers from certain dis- ities such as duodenal ulcers in accordance with the ilability of supplies at the time.—Mr. JOHN STRACHEY lied: I have consulted the Minister of Health and we are prepared to do this, because sufferers from duodenal rs or similar troubles may need individual treatment and uld seek advice on diet from a doctor.

Diary of the Week

JULY 18 TO 24

Monday, 19th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. S. L. Baker: General Pathology of Bone.
6.15 P.M. Dr. C. H. Tonge: Surgical Anatomy in Regional Anæsthesia.

Tuesday, 20th

ROYAL COLLEGE OF SURGEONS
5 P.M. Professor Baker: General Pathology of Bone.
6.15 P.M. Dr. Tonge: Anatomy of the Oral Cavity.

Wednesday, 21st

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. E. B. Manley: Histology of Dental Tissues.
6.15 P.M. Prof. G. B. Wright: Spread of Infection in Tissues.
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
3.30 P.M. (Anatomy lecture theatre, University of Edinburgh.) Prof. H. Barcroft: Blood-flow through Extremities.

Thursday, 22nd

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. John Beattie: Changes in Volume and Distribution of Body Water under Conditions of Stress. (Bernhard Baron lecture.)
5 P.M. Prof. R. J. Brocklehurst: Taste.
6.15 P.M. Mr. Manley: Histology of Dental Tissues.

Friday, 23rd

ROYAL COLLEGE OF SURGEONS
5 P.M.: Mr. Manley: Histology of Dental Tissues.
6.15 P.M. Mr. R. T. Payne: Acute Infections of Salivary Glands.
BIOCHEMICAL SOCIETY
11.15 A.M. (Biochemistry Department, University of Glasgow.) Opening of two-day meeting.
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
4.30 P.M. Prof. G. F. Marrian, F.R.S.: Neutral 17-Ketosteroids.

Saturday, 24th

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.1
2.30 P.M. Dr. A. H. Harkness: Pathology of Gonorrhœa. (Presidential address.)
BIOCHEMICAL SOCIETY
11.15 A.M. Two-day meeting, continued.

Births, Marriages, and Deaths

BIRTHS

BATTEN.—On July 7, in London, the wife of Dr. Henry Batten—a son.

CANT.—On June 30, at Oxford, the wife of Dr. F. E. V. Cant—a daughter.

CHURCHILL-DAVIDSON.—On July 9, at Kuala Lumpur, the wife of Dr. H. C. Churchill-Davidson—a daughter.

DALE.—On July 5, the wife of Dr. Donald Dale—a son.

ELGOOD.—On July 9, at Cardiff, the wife of Dr. F. R. M. Elgood—a son.

JEANES.—On July 1, at Woolwich, the wife of Dr. C. W. L. Jeanes—a son.

JOHNS.—On July 3, at Banstead, Surrey, the wife of Dr. T. A. M. Johns—a daughter.

JOHNSON.—On July 4, in London, the wife of Mr. Harold Daintree Johnson, F.R.C.S.—a son.

MCDONALD.—On July 3, in Edinburgh, the wife of Surgeon Lieutenant R. S. McDonald, R.N.—a daughter.

MCLARDY.—On July 6, in London, the wife of Dr. Turner McLardy, M.B.E.—a son.

MARSH.—On July 1, the wife of Dr. Alan Marsh—a son.

MORGAN.—On July 7, the wife of Dr. G. O. Morgan—a daughter.

PENROSE.—On July 2, at Bristol, the wife of Mr. J. H. Penrose, F.R.C.S.—a daughter.

SCOTT.—On July 8, at Elgin, the wife of Dr. G. I. Scott—a son.

WALKER.—On July 6, at East Sheen, the wife of Mr. Alan Walker—a son.

MARRIAGES

DURAS—WALROND.—On June 30, at Brompton, Frank Paul Duras, M.B., to Karen Dorothy Walrond.

MARSDEN—COOPE.—On July 3, at Penarth, Henry Basil Marsden, M.B., to Pamela Jill Coope, B.CHIR.

DEATHS

BIDWELL.—On July 4, at Bloemfontein, South Africa, Charles Hugh Bidwell, M.R.C.S., aged 76.

COOKSON.—On July 7, at Blagdon, Somerset, Reginald George Francis Cookson, L.R.C.P.I.

DOUGLAS-WEBSTER.—On July 2, in South Africa, Edgar Maurice Douglas-Webster, L.R.C.P.E.

FORBES.—On July 8, at Rochester, John Turnbull Thomson Forbes, M.R.C.S., wing-commander, R.A.F. Medical Service retd.

JACOBS.—On July 5, Laurence Jacobs, M.A. Edin., M.B. St. And.

PEPPER.—On July 9, Charles Edward Pepper, M.B. Edin., aged 71.

SMITH.—On July 11, Hugh Bernard Willoughby Smith, F.R.C.S., aged 68.

SYMONS.—On July 3, at Church Crookham, Hants, Sir Thomas Symons, K.B.E., C.S.I., M.R.C.S., aged 76.

Notes and News

NATIONAL INSURANCE CONTRIBUTIONS

THE position of doctors and dentists under the National Insurance and Industrial Injuries schemes has been announced by the Ministry of National Insurance. Doctors and dentists on the *lists of executive councils will be insurable as self-employed* persons (class 2) for their work in that capacity; and the same applies to those engaged in private practice only. The weekly contribution is 6*s.* 2*d.* for a man and 5*s.* 1*d.* for a woman. Those *engaged full-time in hospitals or similar* institutions, or under local or public authorities—e.g., as medical officers of health or in the school medical or dental services—will be insurable as employed persons (class 1) under the National Insurance scheme; they will also be insurable under the Industrial Injuries scheme. This applies, too, where the engagement is not for whole-time services but the duties normally occupy more than half the time and payment is received by salary. Similarly, doctors or dentists engaged by commercial or business organisations who are paid by salary and who spend more than half their time on duties for any one such employer are to be treated as employed persons under both schemes. The total combined National Insurance and Industrial Injuries contribution is 9*s.* 1*d.* a week for a man and 7*s.* 1*d.* for a woman, of which the employee's share is 4*s.* 11*d.* and 3*s.* 10*d.*, respectively.

A NEW CANCER JOURNAL

IN sumptuous shiny format and finely illustrated, the first number of a journal of the American Cancer Society has made its appearance. *Cancer* combines the functions of both *Cancer Research* (U.S.A.) and the *British Journal of Cancer Research* in that it includes papers on the human disease and on experimental work, and selected abstracts from every branch of the subject. Contributions to the first number have set a high standard. They deal with general aspects rather than with individual case-reports. For example, 11 cases of sarcoma arising in irradiated bone are reported, fibroblastic hyperplasias and new growths are reviewed and classified, and the cellular reaction in post-mastectomy lymphœdema is critically examined. The authors of the last-mentioned paper report 6 cases of lymphangiosarcoma developing at an average interval of $12^1/_2$ years from the time of the operation. Experimental work includes the evolution of cancer of the uterine fundus in the rabbit, electrophoretic studies of plasma-proteins in neoplastic disease, and a description of the conversion of a *cancer-resistant to a cancer-susceptible strain of mice by* chemical means. Apart from the usual check on padding with unessential material the space allowed to authors is not limited. The editor is advised by a board including representatives in clinical, radiological, and pathological fields, in research, public health, education, and statistics.

DIRECTORY OF SERVICES

THE National Council of Social Service has published a "handbook of information and directory of organisation of voluntary social services," which Mr. W. G. S. Adams, chairman of the council, introduces with a scholarly survey of their work in this century. Mr. D. H. W. Hall discusses their finance and Miss Eileen Younghusband writes on social service as a profession. The second section summarises the work being done in different fields—such as mental health, blind welfare, and the countryside—and lists the bodies particularly interested in each. The third section, which is the directory proper, gives the name and address and succinct particulars of 300 organisations. The handbook may be obtained from the council, 26, Bedford Square, London, W.C.1 (price 7*s.* 6*d.*).

BEDWETTING

NOCTURNAL enuresis can be a cause of shame and discomfiture for some people throughout life. A committee on Psychiatry and the Law set up *jointly* by the British Medical Association and the Magistrates Association has produced a memorandum[1] which sets out clearly some of the known facts about the condition and offers common-sense guidance for its treatment and management. Poor training in childhood accounts for some 6% of enuretics, and physical abnormality for perhaps 9–10%. Some 85% are suffering from
of function, and in these the psychological back
the condition often repays study; the memorandum is
hardly emphatic enough on this point, though it is me
that the psychiatrist will often be needed in addition
family doctor, either to give more intensive psych
treatment or to assist in diagnosis. In many intr
cases much can be done by good *management* to reli
miserable family situation created by enuresis, e
when it persists in an adult. The memorandum make
point well: the use of a mackintosh sheet or a rubber
for night wear, the practice of rousing the sleeper b
alarm-clock at a time before he habitually passes water,
a certificate from the doctor for an extra soap ration al
to mitigate the nuisance caused by the symptom. All
same it *is*, in most cases, a symptom, and the writers of
memorandum rightly insist on the importance of tr
and the need to study the causes of relapse—give
emotional stress, domestic worry, a nervous break
unsuitable environmental change—"anything in fact t
can upset a somewhat narrow or precarious adaptatio
life." But an adaptation so precarious that it cru
under the ordinary jolts of our lot perhaps deserves a l
superficial and resigned approach from the doctor.

MENTAL DEFICIENCY HOSPITALS UNDER THE

THE new Mental Deficiency Regulations, 1948, make
great changes apart from those necessary to bring the hospit
for this class of patients under the Minister. *The te*
"certified institutions" will no longer apply *to these loc*
authority hospitals, but will be reserved *for places run f*
profit, or at least with private (paying) beds. Medic
officers of institutions vested in the Minister will now b
allowed to sign medical certificates accompanying the orde
This will have little effect in London, where the Lond
County Council have their own certifying officers; but
may simplify things in counties where *the expert from t*
local institution runs clinics and is also asked to do
certifying.

A change of much more interest to *patients* gives sup
tendents the power to grant, on their own respons
two weeks' leave instead of one. Licence for any lo
period must be agreed to by two members of the h
management committee.

VETERINARY EDUCATION

IN his inaugural lecture in the chair of animal path
at Cambridge[1] Prof. W. I. B. Beveridge sketches the dev
ment of the veterinary art and profession. For 5000 y
except during the last century or so, man has depended
animals for land travel as well as for much of his food
clothing. The horse was all-important in military opera
and the invention of the nailed-on horseshoe towards the
of the 9th century A.D. was an event of great internati
importance. Professor Beveridge remarks that the hea
self-criticism of veterinary education by the profession
has perhaps stimulated other criticism, which is sometim
ill informed; and some of the faults in veterinary educati
are common to education in other fields. Outlining the pre
curriculum of five years, he says that students coming up
Cambridge after already taking the 1st M.B. will take
years to qualify; which makes one wonder *if so long a t*
is justifiably spent on the course. The veterinary stu
should obtain a wide scientific background at Cambr
but, as we said in reviewing the second report of the Lo
Committee,[2] the importance of *illustrating* general pr
by reference to the animals and problems with whi
student will deal after qualifying must be kept in mind
is largely recognised in bacteriology and pathology,
perhaps particularly important in physiology, beca
medicine there is a tendency to focus increasing att
on the study of human function. It is a little surpri
hear that for anatomy the dog is regarded as probably
most suitable type of animal, though ruminants are so
more important to veterinarians *and sheep should be* m
obtainable for dissection.

Perhaps the most interesting part of the lecture is
dealing with postgraduate teaching and research. The
research-worker learns much by precept and example,
there is scope for formal training in basic principles and

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[1] Enuresis. London: B.M.A. House, Tavistock Square, W.C.1. 1948. Pp. 11.

[1] London: Cambridge University. 1948. 1*s.* 6*d.*

[2] *Lancet*, 1944, i, 735.

iques. Professor Beveridge says that the student should couraged to read the lives of the great scientists; the tant rôle of the so-called chance observations and ion, together with the general principles of planning iments, should be explained to him.

ACCESS TO WATER GATHERING-GROUNDS

OSE who are responsible for gathering and purifying are in the habit of arguing that rigid restrictions on s to gathering-grounds are essential unless costly new ying plant is to be installed. A subcommittee of the ral Advisory Water Committee, appointed by the Minister ealth, takes a different view. In its report,[1] published lest the subcommittee finds that, if the water is suitably ied, there is no reason for excluding the public from ering-ground as such; boating and fishing on reservoirs sometimes be permitted under rigorous control, but no ing should be allowed and the public should be generally uded from the banks. Land should be put to the utmost cultural use; but sewage from human habitations should revented from getting into the reservoir, and farmyard nure must not be allowed to drain into feeder streams or rwise to reach the reservoir. Subject to these limitations, *the avoidance of large crowds*, the committee "can see justification, on grounds of water purity, for prohibiting ss by walkers, cyclists, or motorists to the remainder of gathering ground." Camping and caravanning should, ever, be restricted to approved sites; and it is suggested t camping organisations might publish maps showing mitted sites.

AMENDMENTS TO NATIONAL FORMULARY

EVERAL changes in the *National Formulary* will take ct from Aug. 1. There will be three new mouth-washes—utorium acidi tannici; collut. sodii chloridi co. (sod. or. gr. 8 and sod. bicarb. gr. 2 to the ounce of peppermint ter); and collut. zinci sulphatis et zinci chloridi co. Other litions will be: pigmentum arseni et ipecacuanhæ, and ella acidi acetylsalicylici et quininæ co., containing aspirin 3, phenacetin gr. 3, caffeine gr. $^{1}/_{4}$, and quinine sulphate $^{1}/_{4}$. Gargaresina acidi tannici and nebula penicillini will be eted.

ASSOCIATION OF MUNICIPAL SPECIALISTS

AT a special meeting on June 28, members unanimously eed that this association should continue to serve whole-e medical specialists. In future it is to be known as the ociation of Whole-Time Salaried Specialists, and all whole-e specialists will be eligible for membership. Inquiries uld be addressed to the association's office at 45, Lincoln's n Fields, London, W.C.2 (Tel.: Holborn 3474).

DENTAL CARE OF THE YOUNG

SPEAKING last week in Liverpool at the annual meeting of British Dental Association, Mr. P. G. Capon, the new sident, said that it was illogical that the dental care of preschool child should be the responsibility of the Minister Health, that of the school child the responsibility of the nister of Education, and that of the adolescent nobody's ponsibility. The inadequate provision for children would tinue to produce the familiar broken-down dentition of the ult. It seemed tragic, said Mr. Capon, that the dental fession had not been asked to assist in establishing a structive plan, which in time would have done much to ntrol the situation.

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yal Appointments

The following appointments to Queen Mary's Household ve been gazetted:

urist, Mr. John McLaggan; surgeon-oculist, Mr. J. G. Milner; l surgeon-dentist, Mr. Douglas Lennie.

w Chief Nursing Officer

The Minister of Health has appointed Miss E. Cockayne be chief nursing officer as from July 1, in succession to Dame therine Watt, who has become chief nursing adviser. ss Cockayne was formerly matron at the Royal Free spital.

University of Cambridge

On June 22 the degrees of M.B. and B.CHIR. were conferred by proxy on D. J. Morton.

University of London

Dr. J. L. D'Silva has been appointed to the university chair of physiology tenable at London Hospital medical college, as from Oct. 1.

Dr. D'Silva, who graduated PH.D. at London University in 1931 and D.SC. in 1940, qualified from St. Bartholomew's Hospital in 1942. He held appointments there as demonstrator in physiology, house-physician, and chief assistant; and he was later an assistant physician in the E.M.S. In 1943 he became M.R.C.P. Two years ago he was appointed reader in physiology at Bart's. Dr. D'Silva has published articles on the dismutation of disulphides, the effect of adrenaline on serum potassium, and the treatment of arterial hypertension.

University of Manchester

Dr. E. W. Anderson has been appointed professor of psychiatry and director of the university department.

Dr. Anderson qualified M.B. at Edinburgh in 1923 and held hospital appointments in Edinburgh and Dover. He graduated M.D. in 1927, and in 1930 became M.R.C.P. In 1929 he was appointed assistant medical director at the Maudsley Hospital, and in 1935 medical director of the Cassel Hospital. In 1937–38, as a Rockefeller fellow, he spent a year at Continental clinics, and on his return was appointed consulting psychiatrist to Devonshire county council. From January, 1940, he served in the R.N.V.R. as a neuropsychiatric specialist, attaining the rank of surgeon-commander. In 1946 he was elected F.R.C.P. Last year Dr. Anderson returned to the Maudsley Hospital as a physician, and he has taught at the institute of psychiatry there and at the Postgraduate Medical School of London.

University of Liverpool

At a congregation on July 3 the following degrees were conferred:

M.D.—G. M. Ardran, B. K. Ellenbogen, E. W. T. Evans, K. B. Gibson, A. L. Latner, Ivan Leveson, J. M. Swithinbank.

M.S.—Raphael Marcus; R. A. Smith (in absentia).

M.Rad.—H. G. Frank, A. M. Fraser, Ifan Pierce-Williams, H. L. Ross, G. D. Scarrow, W. I. Walker, John Winter.

M.B., Ch.B.—H. T. G. Williams (second-class honours), Cecil Alexander, June P. Arnold, W. B. Ashby, D. J. B. Ashley, Mary F. Barrie, A. J. Bathurst, J. F. Bell, L. B. Bruce, C. R. Cartwright, G. D. Currie, Anthony Dalzell, F. J. Dunn, E. C. Edwards, H. L. Goffman, T. D. H. Gray, Ellis Gruber, Elspeth M. Hill, Sylvia S. C. Hinde, C. I. Hood, A. W. Howel-Evans, C. O. Le C. Hughes, J. C. Humber, John Humphreys, Mair Humphreys, P. F. Jack, Dorothy M. Jennings, Elizabeth M. Johnson, C. H. Jones, W. W. Jones, Peter Kilburn, J. G. Kingan, Christine Lewis, J. F. Lynch, A. G. Mackinnon, Mary K. Marchant, Geoffrey Marsh, Eric Martindale, D. N. Menzies, Margaret J. Miller, Helen T. Morgan, E. G. Myerscough, James O'Donoghue, Mary G. O'Hare, W. R. Parkes, Leslie M. Pinkerton, Gwyneth E. Pritchard, Millicent M. C. Regan, Freda M. Roberts, J. R. Roberts, R. V. Roberts, Kathleen M. Roby, Barbara F. M. Shirley, S. S. Swift, H. M. Thomas, Harral Thompson, Joyce K. Watkin, W. K. M. C. Watkins, D. B. Wilkinson.

University of Sheffield

The following appointments are announced:

Dr. T. Summerfield King, lecturer in anatomy; Mr. A. A. Carlyle, lecturer in physiology; Mrs. Joan Laird, M.B., research assistant in medicine; Dr. John Lorber, research assistant in child health; Mr. G. Y. Kennedy, research-worker in the department of pathology under the auspices of the British Empire Cancer Campaign; and Dr. Gilbert Forbes, senior lecturer in charge of the new department of forensic medicine.

University of Nottingham

Nottingham University College has been granted full university status. Founded in 1881, the college was the first in this country to be formed by municipal action. Lord Trent is to be the first chancellor of the university; and the vice-chancellor will be Mr. B. L. Hallward, formerly headmaster of Clifton College.

University of Glasgow

The following degrees and diplomas have lately been conferred:

M.D.—William Fowler, J. A. C. Knox, A. M. Lamont (in absentia), Robert Leishman, C. E. B. Lynch, Jean M. Neville, J. A. O'Connor, J. M. Rosie.

M.B., Ch.B.—D. C. Aird, G. W. Allan, J. B. Allan, J. M. Anderson, D. S. Andrew, Robert Bain, Agnes R. Baird, J. W. Baird, G. D. Ballantyne, Janet M. Bell, Verne A. Bennett, John Bingham, J. F. Boyd, Doris J. H. Brechin, A. M. Brown, J. H. L Bruce, Alan Bryce, J. R. Bryson, R. A. Buchanan, G. I. Cameron, Douglas Campbell, A. M. Chalmers, Martha A. A. Chisholm, Jeanne M. Clarke, E. N. Coleman, Marion H. C. Cornock, P. M. Crawford, R. J. Cruickshank, D. P. Daly, John Dickson, James Donnelly, R. L. Duncan, J. F. Dunn, I. D. Ferguson, T. B. Ferguson, Frederick Fischbacher, A. M. Fotheringham, Thomas Gardner, Jean Gibson,

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[1] Public Access to Gathering Grounds; Afforestation and Agriculture on Gathering Grounds. Report of the Gathering Grounds Subcommittee of the Central Advisory Water Committee. H.M. Stationery Office. Pp. 34. 9d.

Winifred A. Gibson, Ian Gilfillan, O. C. L. Gloster, W. F. Gordon, C. P. D. Grant, R. N. Greenhalgh, Erika P. Grossfeld, Matthew Hamilton, R. W. Harrington, J. M. Hiddleston, Charles Hodes, J. F. Kay, Thomas Kempton, Marshall Kennedy, G. M. Kerr, P. M. Kinloch, Lilias H. Liston, Edith B. Loudon, C. M. Macaulay, I. G. W. McDonald, I. R. Macdonald, J. A. McFadzean, J. P. R. MacFarlane, H. C. McGilp, G. S. McGregor-Robertson, S. S. Macilwain, G. K. K. McKay, Anne E. C. MacKinnon, Janet J. Mackintosh, Christina I. Maclean, Sheena D. MacLeod, William McRoberts, R. D. Mairs, W. S. Manderson, W. W. Marshall, R. H. M. Mavor, A. W. Morrison, E. D. Morton, J. W. Muir, Mairi C. Nicolson, Nanette H. Nisbet, Walter Norris, J. L. Patterson, P. B. Pullar, Rhona A. Reid, James Ritchie, J. M. Robertson, Ellen M. A. Russell, Hazel E. A. Saunders, Hope B. T. Scott, W. G. Semple, I. C. Seymour, Hazel M. Short, J. B. Sloan, A. N. Smith, A. I. Smith, Anne F. Smith, G. D. Smith, Woolfred Sniper, Francis Stewart, A. E. Stuart, Peter Sullivan, H. I. Tankel, A. C. S. Taylor, A. J. Tear, J. S. Ternie, Henry Thompson, I. B. Thomson, W. M. S. Thomson, R. N. Thorburn, I. M. Todd, Janet F. Walker, Joan L. Walker, A. D. Wallace, P. N. Waugh, D. H. Wilson, D. L. Wilson, W. M. Wilson, Jean-Margaret H. Wotherspoon.

D.P.H.—A. S. Brodie, Betsy Brown, H. B. Brown, L. G. Bruce, William Cormack, A. P. Curran, G. G. Lindsay, J. M. McEwan, Margaret W. Macgregor, James Maclachlan, Iain Macleod, A. N. MacPhail, G. A. Mills, May B. Paterson, J. S. M. Pollock, I. M. Richardson, E. M. Sewell, James Smith, John Thompson, R. T. B. Watson, Margaret L. Williamson.

Royal College of Physicians of London

The Mitchell lecture, to be given by Dr. Robert Coope, has been postponed until Thursday, Nov. 18.

Royal College of Surgeons of England

At a meeting of the council on July 8, Lord Webb-Johnson was re-elected president for an eighth year. Mr. L. E. C. Norbury and Mr. V. Zachary Cope were elected vice-presidents.

The following were elected lecturers for the ensuing year:

Hunterian professors: Mr. Hamilton Bailey, parotidectomy; Prof. Shafik Shalaby, amœbic liver abscess; Mr. Terence Cawthorne, labyrinthine vertigo; Dr. W. S. C. Copeman, lumbar fibrositis; Mr. R. W. Raven, malignant melanoma; Mr. M. W. C. Oldfield, hare-lip and cleft palate; Mr. C. H. Gray, painful hip-joint; Mr. A. C. Kanaar, pulmonary atelectasis; Mr. J. G. Bonnin, diastasis of the tibiofibular syndesmosis; Mr. D. F. E. Nash, development of micturition control; Mr. W. S. Lewin, acute subdural and extradural hæmatoma in closed head injuries; Mr. Robert Roaf, residual disability following injuries of the peripheral nerves of the upper extremity; Mr. John Loewenthal, intractable ulceration of the leg, with special reference to streptomycin; and Mr. R. A. R. Taylor, acute pancreatitis. *Arris and Gale lecturers:* Mr. R. K. Bowes, infra-red photographic studies of superficial veins in the female; and Prof. R. H. Goetz, vascular diseases, with special consideration of clinical plethysmography and the surgical physiology of the autonomic nervous system. *Erasmus Wilson demonstrators:* Mr. C. E. Shattock, Dr. L. W. Proger, Dr. R. M. Haines, and Mr. Guy Blackburn. *Arnott demonstrators:* Mr. P. H. Mitchiner, Mr. R. J. Last, and Dr. F. S. Gorrill.

A diploma of membership was granted to R. H. R. Aston. Diplomas of fellowship were granted to the following:

J. W. Ardagh, D. W. Bain, P. B. Banaji, C. R. Berkin, K. P. Bhargava, B. E. Blair, S. M. Boctor, C. A. Brown, J. A. Carr, Richard Chignell, E. F. Chin, R. I. Cohen, J. C. F. Cregan, V. H. Cumberland, H. C. Dales, H. P. Dunn, E. M. Elmhirst, D. V. Evans, J. B. Farquhar, Thomas Faulkner, James Freeman, L. B. Gottlieb, Evan Griffiths, E. V. Hope, N. N. Iovetz-Tereshchenko, K. G. Jayasekera, D. H. Jenkins, A. R. Johnson, C. J. Kaplan, A. E. Kark, Z. K. Kazi, R. R. Klein, J. B. Kyle, D. W. Lacey, L. P. Lassman, Tobias Levitt, T. G. E. Loosemore, B. C. H. Luker, A. M. Macarthur, A.-R. Makey, Margaret M. Mason, C. K. P. Menon, N. H. Morgan, I. F. K. Muir, C. I. Murphie, H. H. Nixon, K. R. Pai, D. T. H. Paine, Matthias Paneth, Eric Parry, V. T. Pearse, P. F. Philip, J. H. Phillips, W. J. Pullen, P. E. Rees-Davies, A. G. Riddell, S. S. Rose, Richard Rowlandson, Heinz Salz, C. S. Savage, P. H. Schurr, C. G. Scorer, R. I. R. Skelley, T. B. Smiley, W. K. Smiley, Ross Smith, Rupert Solley, J. P. Stephens, [illegible] Tagart, J. E. Talbot, V. R. Thayumanaswan[illegible] Turnbull, J. P. Turney, B. A. Ward, E. A. [illegible] M. F. Windsor, W. S. Wood, J. J. Woodward.

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D.P.M.—P. A. Adam, G. B. Barker, Catherine H. S. Begg, S. H. Beckner, Daniel Cappon, R. O. Cooke, John Donnelly, Audrey L. Ferguson, Margaret W. Ferguson, G. S. Gladstone, R. S. Hodge, D. W. K. Kay, M. R. Leahy, J. F. McHarg, Rangasamy Natarajan, D. J. Petit, G. S. Prince, A. S. L. Rae, A. G. Silver, R. H. F. Smith.

D.L.O.—D. J. J. Ackermann, A. C. Cox, N. S. Daw, D. A. Draffin, B. I. Eames, I. N. Fulton, Hrisikesh Hazra, P. H. Huggill, M. S. Khan, R. A. Lindsay, R. L. McFadden, E. A. Malkin, Mohammad Mohsin, A. T. P. Pitt, D. M. Stevens, J. G. Stenham.

D.A.—R. I. W. Ballantine, M. M. Boyle, A. S. Brown, J. R. Esplen, J. K. Farquhar, Violet Fry, A. H. Grannt, D. J. Hadfield, Marie E. Hill, D. A. B. Hopkin, M. D. C. Hosford, Howard Jackson, P. D. Johnson, R. H. N. Lake, H. L. Leaming, W. J. Lewis, L. H. Lithman, P. F. M. MacDonagh, Alistair Mackenzie, G. A. Mandow, Timothy Marshall, J. G. Millers, John Moore, W. D. Munro, C. J. K. Orr, Anthony Owen-Flood, H. P. L. Ozorio, C. H. Podesta, E. S. Pope, T. R. Steen, Mark Swerdlow, D. V. Thomas, Frances M. Ulyatt, Claude Umagilliya, Harry Walker, A. T. Welsh, H. B. Young.

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Staincliffe County Hospital, Dewsbury (resident surgical officer); Northampton General Hospital (resident surgical officer, surgical registrar, and orthopædic house-surgeon—additional recog St. Andrew's Hospital, Dollis Hill (senior and junior house- Central Middlesex County Hospital (three house-surgeons); C Hospital, Whiston (resident surgical officer, class 3 (rehabilit officer, and general house-surgeon).

Royal College of Surgeons in Ireland

The following have received the diploma of fellowship:

G. I. Fenton, E. A. McGivern, S. N. Rutherford, E. F. Sha

International Students' Congress

The Students' International Clinical Congress, opened in London on July 6, was continued at Oxford Tuesday; and on Monday the delegates will go on Birmingham. Organised by the British Medical Studen Association, this is believed to be the first conference of sort.

Royal Society of Medicine

As announced last week Sir Henry Dale, O.M., has be elected president of this society in succession to Sir Maur Cassidy. The following officers and other members of cou were also elected at the annual meeting of fellows on July 6

Hon. secretaries.—Mr. W. A. Pool and Dr. A. T. M. Wilson.
Hon. treasurers.—Dr. Charles Newman and Mr. L. R. Broste
Hon. librarians.—Mr. E. K. Martin and Dr. Thomas Hunt.
Hon. editors.—Mr. E. A. Crook and Dr. E. R. Cullinan.
Other members of council.—Miss Geraldine Barry, Dr. E. E Boland, Dr. R. R. Bomford, Sir Ernest Rock Carling, Dr. Macdon- Critchley, Dr. Maurice Davidson, Sir Gordon Gordon-Taylor, Dr. Charles Harris, Dr. Bernard Hart, Dr. J. C. Hawksley, Mr. J. F Hunter, Dr. F. Avery Jones, Mr. D. H. Patey, Mr. A. E. Porrit Mr. R. H. O. B. Robinson, and Sir Henry Tidy.

Royal Medico-Psychological Association

Members of this association had the opportunity, at their annual dinner on July 7, to hear something about the work of the Churches Council of Healing. The Bishop of Lincoln, in proposing the toast of Medicine, told how this grow body came into being as the Guild of Health, founded by t late Archbishop William Temple. Knowing of clergy w were capable of spiritual healing, Archbishop Temple wi to bring them into touch with psychiatrists, in order th their work might be complementary. At a joint meeti the Council of Healing with the British Medical Associ some years ago, it was agreed that several doctors s join the committees of the council, and the collaborati the two groups of healers has in some cases, the Bishop s given remarkable and mysterious results. Dr. A. Pool member of the council, in replying to the toast described a inexplicable recovery which he had recently seen.

Dr. R. Ström-Olsen, who proposed The Guests, appea to Miss D. M. Smith, president of the General Nursing Coun to work for the better status of the mental nurse; wh Miss Smith was evidently ready to do. Mr. John Edwar M.P., in proposing the toast of the association, spoke a l of the National Health Service, and of the Governme wish to create conditions under which doctors can work t the greatest advantage of their patients; while Dr. W. Re Thomas, the president, who replied on behalf of the association, assured Mr. Edwards that the incidence of ment breakdown among public men is very small. He seemed les satisfied with their works than their health, however, remarki that the present high incidence of anxiety depression in t public is attributed by some to our legislators.

After receiving the Cameron prize in Edinburgh for h work on the effects of drugs on the thyroid gland, Prof. E. Astwood, endocrinologist at the Pratt Diagnostic Hos in Boston, is in London until July 23, lecturing for the B Medical Association and carrying out a series of vi endocrinological departments arranged by the British Co

CORRIGENDUM.—*Bronchiectasis Simulating Chronic B- chitis.*—In this article by Dr. J. D. H. Wearing (May p. 822) reference to an earlier paper by Dr. L. C. Martin a Dr. F. R. Berridge (*Lancet*, 1942, ii, 327) was omitted in er

Appointments

GILROY, J. M., M.B. N.U.I., D.P.M.: asst. physician in psycholo medicine, Prince of Wales's Hospital, Plymouth.

HARDING, R. D., B.A., D.M. Oxfd, M.R.C.P., D.T.M. & H.: senior (sleeping sickness service), Nigeria.

LOVIBOND, J. L., M.A., M.D. Camb., F.R.C.P.: asst. cardiol London Chest Hospital.

HE AMERICAN TEACHING HOSPITAL*

ELI DAVIS

M.D., M.Sc. Manc., M.R.C.P.

N order to attract the best men as teachers, a medical ool must have great prestige and a good deal of money, alternatively it must have a philosophy or creative ssion which will draw to it fine minds even if the school elatively poor.

he character of the institution is determined by the ality of its teachers and of its students; and in the ding schools of the United States there is an admirable dency for teachers and students to be regarded as ior and junior fellow workers in the same field. There too, a healthy inclination by medical schools to choose ung departmental chiefs, who get responsibility while ey are most creative. At most schools full-time chiefs e preferred to those serving part-time, but a certain sticity is evident in the pursuit of this principle. At arvard, for example, the chief is considered to be full-me and is given a salary which makes him relatively dependent of outside sources of income. Nevertheless, e is allowed some private practice, mostly on the hospital remises, and may retain the fees: the psychological tisfaction thus derived seems even more important an the financial return. Other schools allow their iefs private practice, but the fees must go to the epartment.

The needs of the hospital, the student, and the patient ake it essential that the chief selected devotes most of is time to the hospital. But there is an honoured lace for part-time teachers of distinction. Outstanding linicians in private practice who can teach and who ke to teach should be given a part in the education of he students.

DEPARTMENTAL ORGANISATION

In many American hospitals and medical schools there s a single department of medicine, surgery, pædiatrics, bstetrics, and so on, each with a chairman or chief. hould the department of medicine include under one hief the departments of neurology and dermatology? ikewise, should the department of surgery include nder its chief the departments of orthopædics and tolaryngology and ophthalmology? In some leading chools the tendency is to put all the subdivisions of the eld of medicine or the field of surgery (and so on) under ne chairman. This is convenient because it allows for tegrated teaching, the smoother allocation of beds, and ider experience for the intern; and it is easier for a irector or a dean to deal with one head than with several eads. But the best men seem to flourish only when they ave real autonomy and responsibility for the development nd fostering of their specialty. The administrative load n chiefs of departments was great enough even in the bsence of further responsibility for the specialties, and eriously interfered with their availability for teaching nd for research. To add to their responsibilities in this ay would, in some cases, be crushing. After all, it should e the duty of the director and dean to administer, to tegrate, and to correlate.

CURRICULUM

Many American medical students have had four years f college training before entering medical school, and ractically all graduates take an internship: these nportant facts influence the form of the curriculum. t many schools the student begins his real clinical raining two and a half years before graduation. Some uthorities assert that this is too late, and at certain schools students begin clinical work four years before graduation. Other teachers, however, fear that this early introduction to the wards may cause neglect of the basic sciences through the immediate interest of the patient.

At some places correlation courses have been well developed; for example, in physiology, when fluid balance is being discussed, patients with œdema and patients with dehydration are presented. Correlation is, however, far too much in one direction; while clinical topics are introduced early, there is not enough of the other form of correlation—for example, calling in the physiologist when the physician is confronted with a case of myelitis, or calling in the biochemist for personal consultation when the results of jaundice tests are baffling. Correlation should be two-way. Biochemistry and physiology should continue to be taught in the later years of the course.

To make for better correlation, Rochester medical school has initiated some double professorships—for example, there is a professor of bacteriology *and* internal medicine, and also a professor of medicine and psychiatry.

At some centres the emphasis at clinical pathological conferences is no longer on diagnosis but on the interpretation of symptoms and signs in terms of biochemistry and modified physiology; indeed one aim of correlation is to get physiological thinking at all levels. The experiment is being tried of assigning the student to a patient rather than to a department: so if a patient is transferred from one department to another, the student is still concerned with him.

Dr. Alan Gregg has succinctly outlined the essential aims of training. The student must be taught to observe accurately and comprehensively. He must learn to reason soundly about observations made. He must pay attention to the observations of others, and so learn how to use a good medical library. He should approach the sick with a sense of compassion.

Biochemistry is the dominant discipline in many medical schools. It is felt, however, that just as this is a biochemical era, biophysics is likely to make outstanding contributions in the next decade, and the biophysicist and his department are becoming more frequent in progressive medical schools.

Note may be taken of the attractive arrangement in Dr. A. Rich's department of pathology in Johns Hopkins medical school. Here, in addition to the usual services, a special room is devoted to the pathology of each clinical division—e.g., gynæcology, dermatology, and ophthalmology. Working in these rooms are not only the permanent staff but the assistant resident of the clinical department concerned, who remains there for a year, acting as a living link between his clinical division and the department of pathology. At the same time he gets first-rate grounding in pathology.

METHODS OF TEACHING

At Yale no courses are compulsory; the idea is to make the student want to acquire the facts rather than to teach him all the facts. Moreover, since the curriculum is not crowded, the student is left with some spare time. At Yale no student is recommended for his degree until, as well as passing his final examination, he has presented a satisfactory thesis. This thesis is a valuable educational weapon; it teaches the student to think and observe, and to make use of a medical library.

A successful experiment is being conducted at Rochester, New York. Each year a number of stipends is offered to students to enable them to spend an extra year working on any subject in the medical curriculum that they choose; and during this time, in which they pay no fees, they are regarded as junior members of the teaching staff. This arrangement encourages the good

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* Based on the report of a survey undertaken for the Hadassah Medical Organisation, Jerusalem.

Winifred A. Gibson, Ian Gilfillan, O. C. L. Gloster, W. F. Gordon, C. P. D. Grant, R. N. Greenhalgh, Erika P. Grossfeld, Matthew Hamilton, R. W. Harrington, J. M. Hiddleston, Charles Hodes, J. F. Kay, Thomas Kempton, Marshall Kennedy, G. M. Kerr, P. M. Kinloch, Lilias H. Liston, Edith B. Loudon, C. M. Macaulay, I. G. W. McDonald, I. R. Macdonald, J. A. McFadzean, J. P. R. MacFarlane, H. C. McGilp, G. S. McGregor-Robertson, S. S. Macilwain, G. K. K. McKay, Anne E. C. MacKinnon, Janet J. Mackintosh, Christina I. Maclean, Sheena D. MacLeod, William McRoberts, R. D. Mairs, W. S. Manderson, W. W. Marshall, R. H. M. Mavor, A. W. Morrison, E. D. Morton, J. W. Muir, Mairi C. Nicolson, Nanette H. Nisbet, Walter Norris, J. L. Patterson, P. B. Pullar, Rhona A. Reid, James Ritchie, J. M. Robertson, Ellen M. A. Russell, Hazel E. A. Saunders, Hope B. T. Scott, W. G. Semple, I. C. Seymour, Hazel M. Short, J. B. Sloan, A. N. Smith, A. I. Smith, Anne F. Smith, G. D. Smith, Woolfred Sniper, Francis Stewart, A. E. Stuart, Peter Sullivan, H. I. Tankel, A. C. S. Taylor, A. J. Tear, J. S. Termie, Henry Thompson, I. B. Thomson, W. M. S. Thomson, R. N. Thorburn, I. M. Todd, Janet F. Walker, Joan L. Walker, A. D. Wallace, P. N. Waugh, D. H. Wilson, D. L. Wilson, W. M. Wilson, Jean-Margaret H. Wotherspoon.

D.P.H.—A. S. Brodie, Betsy Brown, H. B. Brown, L. G. Bruce, William Cormack, A. P. Curran, G. G. Lindsay, J. M. McEwan, Margaret W. Macgregor, James Maclachlan, Iain Macleod, A. N. MacPhail, G. A. Mills, May B. Paterson, J. S. M. Pollock, I. M. Richardson, E. M. Sewell, James Smith, John Thompson, R. T. B. Watson, Margaret L. Williamson.

Royal College of Physicians of London

The Mitchell lecture, to be given by Dr. Robert Coope, has been postponed until Thursday, Nov. 18.

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Appointments

GILROY, J. M., M.B. N.U.I., D.P.M.: asst. physician in psycholog medicine, Prince of Wales's Hospital, Plymouth.

HARDING, R. D., B.A., D.M. Oxfd, M.R.C.P., D.T.M. & H.: senior M (sleeping sickness service), Nigeria.

LOVIBOND, J. L., M.A., M.D. Camb., F.R.C.P.: asst. cardiolog London Chest Hospital.

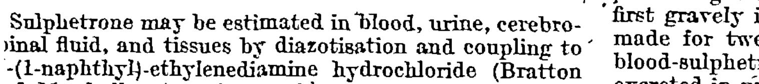
ULPHETRONE: THERAPEUTICS AND TOXICOLOGY *

GEORGE BROWNLEE
B.Sc. Glasg., Ph.D. Lond.
rom the Wellcome Physiological Research Laboratories, Beckenham, Kent

HE discovery in these laboratories of the chemo-apeutic activity of diaminodiphenylsulphone (Buttle . 1937) stimulated a search for derivatives having the iency of the parent drug but not its undesirable city. One derivative, tetrasodium 4 : 4-bis (γ-phenyl-ylamino)-diphenylsulphone-$\alpha : \gamma : \alpha' : \gamma'$-tetrasulph-te, given the registered name 'Sulphetrone,' was first ared in 1936 and attracted attention on re-examina- in 1941 by reason of its freedom from toxicity and potent antituberculotic activity.

rownlee et al. (1948) have described its structure, chemical physical properties, pharmacology, experimental therapy, possible clinical uses; and Brownlee and Kennedy (1948a) e described its suppressive effect on progressive experi-ital tuberculosis in guineapigs. The drug was found to be teriostatic and, in common with other sulphones, incapable liminating the infective organism from animal tissue. In econd study Brownlee and Kennedy (1948b) have shown t sulphetrone is more efficient than 'Promin' in protecting laboratory animal against experimental tuberculosis, and t it is synergic with streptomycin. A clinical evaluation, ortunately restricted to a limited series, was made by digan et al. (1947). The chemical preparation of sulphetrone been described by Gray and Henry (1936) and by Buttle al. (1938).

Sulphetrone is a cream-coloured amorphous material itaining 5–7% water. Its molecular weight is 892·5 d its probable constitution is as follows:



$$\text{H}_5\text{—}\underset{\text{SO}_3\text{Na}}{\text{CH}}\text{—CH}_2\text{—}\underset{\text{SO}_3\text{Na}}{\text{CH}}\text{—NH—C}_6\text{H}_4\text{—SO}_2\text{—C}_6\text{H}_4\text{—NH—}\underset{\text{SO}_3\text{Na}}{\text{CH}}\text{—CH}_2\text{—}\underset{\text{SO}_3\text{Na}}{\text{CH}}\text{—C}_6\text{H}_5$$

It is insoluble in alcohol and other organic solvents but ceedingly soluble in cold water; 40% (w/v) solutions e stable when neutral or slightly alkaline, and a 60% lution may be autoclaved; 10% solutions are isos-otic, but 20% and even 40% solutions are well tolerated tramuscularly.

ESTIMATION

Sulphetrone may be estimated in blood, urine, cerebro-inal fluid, and tissues by diazotisation and coupling to -(1-naphthyl)-ethylenediamine hydrochloride (Bratton nd Marshall 1939), the resultant dye being measured lorimetrically or, better, absorptiometrically. Since lphetrone mixes intimately with precipitated proteins, e conditions governing its optimal recovery were etermined experimentally. They are critical and ust be rigidly respected to obtain 90% recoveries of lphetrone:

To 5 ml. of $N/1$ hydrochloric acid 0·5 ml. of blood or other ody fluid is added and mixed well; 2·0 ml. of 12% (w/v) ichloracetic acid is added, and the well-mixed solution is ltered immediately through a no. 5 Whatman paper and passed until brilliant; 3 ml. of filtrate is mixed with 05 ml. of 0·3% fresh (weekly) sodium nitrite and left for min.; 0·05 ml. of 1·5% ammonium sulphamate is now dded, and the solution left for 2 min. Finally 0·05 ml. of 1% N-(1-naphthyl)-ethylenediamine hydrochloride is added nd mixed well.

The colour is allowed to develop for 30 min. before being ad colorimetrically, or absorptiometrically with a Wratten l filter. All estimates of sulphetrone are given in terms of e anhydrous compound. By collaboration with the Tinto-eter Ltd., a standard Lovibond colour disc is available for the rapid reading of blood and body-fluid estimates falling within the range of 0–9 mg. per 100 ml.

It has been shown (Brownlee et al. 1948) that the visible absorption spectra of the naphthyl-ethylene-diamine derivatives of diaminodiphenylsulphone and of sulphetrone are substantially different in preparations containing equivalent amounts of diaminodiphenyl-sulphone.

TOXICITY

The *acute toxicity* of sulphetrone when given by mouth experimentally to animals is so slight that it cannot be determined with any certainty (Brownlee et al. 1948). Comparison of blood levels at death between ordinary sulphonamides and sulphetrone show the latter to be many times less acutely toxic than sulphanilamide. In the dog acute toxic symptoms are absent with blood-sulphetrone levels as high as 160 mg. per 100 ml. This fact, together with the observation that conjugated derivatives cannot be detected in blood or urine, is a strong link in the chain of evidence that sulphetrone is not easily hydrolysed. Acute toxic effects are not observed in man.

Chronic Toxicity

Very large doses of sulphetrone can be given by mouth for a long time to mice and dogs without producing ill effects. In rabbits, however, a diet containing 4% sulphetrone causes blood changes: (1) a slight but continuous hæmolytic anæmia marked by a concurrent reticulocytosis; (2) a progressive anæmia due to lack of iron owing to competition for alimentary iron by sulphetrone, with which iron forms a non-absorbable complex, and which may be treated, or prevented, by the administration of iron parenterally or by mouth; and (3) an anæmia of slower development but precipitate onset which seems to be of nutritional origin, since it may be both prevented and cured by the simultaneous exhibition of brewers' yeast, and is probably caused by the limitation and alteration of the bacterial flora of the gut by sulphetrone (Brownlee and Tonkin 1941).

That an essentially similar condition develops in man is implicit in the cases reported by Madigan (1948), Anderson and Strachan (1948), and Clay and Clay (1948). The problem was studied intensively in 2 female patients presenting bilateral fibrocaseous disease, and both at first gravely ill. Sulphetrone-balance experiments were made for twelve months, involving daily estimates of blood-sulphetrone concentrations and of the amounts excreted in urine and fæces. Daily estimates were made of reticulocytes, red cells, white cells, and hæmoglobin concentrations; differential cell counts were also made. In all, estimates were made on 298 occasions.

The urine was examined for urobilin (Watson 1936) and abnormal pigment; total porphyrin estimates were made weekly on 24-hour specimens, subsequently to be abandoned because the estimates fell within normal limits. Reference is made below to a chemical study of metabolic products of sulphetrone. The *information* collected has allowed the study of several related problems also to be discussed. The figure summarises the typical response of a patient to sulphetrone by mouth; the dose was at first 3 g. daily (0·5 g. every four hours) and thereafter raised at seven-day intervals by increments of 1 g. until a therapeutic blood level of 7·5–10 mg. per 100 ml. was reached. The weekly estimates are means of seven daily observations. As with the rabbit, the residual effect is a hæmolytic anæmia, which stimulates reticulocytosis. The red cells were crenated, and hæmolysis in fragility tests was observed at 0·45 and increased at 0·48% NaCl.

In all the 94 cases examined no distinguishable effects on the numbers or distribution of white cells were

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The development of sulphetrone is part of a programme of work on Antituberculous Compounds carried out by the Therapeutic Research Corporation of Great Britain.

student to become well grounded in the subject of his choice, and often determines the lines of his future career.

The tendency almost everywhere in America is to cut down didactic teaching, to assign personal instructors to small groups of students, and to use the seminar and the discussion rather than the lecture as the vehicle for teaching. Where students are certain to take an internship, the curriculum can be greatly improved. For example, in surgery it is possible to concentrate on major diagnostic problems and on minor surgery, and to omit details of operations and avoid excessive attendance in operating-theatres. Similarly, the load of teaching in the specialties can be reduced with advantage. At many schools physicians, while they are expected to have their own special interest, must take their full share in general teaching, whether they be hæmatologists, allergists, or cardiologists.

As a rule students pay in fees only one-fifth of the cost of their medical education. Often American schools spend on the student over $2000 a year in excess of fees received.

ADMINISTRATION

The success of a teaching hospital and medical school depends largely on the [illegible] tor who really directs and a dean who [illegible]. In the United States too many of the departmental chiefs, harassed and weighed down by their administrative burdens, are unable to deal properly with their fundamental duties of service to patient, teaching, and investigation. At Johns Hopkins, despite its well-developed tradition, a full-time dean is found to be necessary. Nevertheless, several outstanding American medical schools are run successfully by deans who take some share in teaching and an important part in research; and it seems essential that both dean and director should hold active teaching appointments, and that this principle should be extended to the assistant dean and deputy director. The dean need not, however, be chief of a professional department.

BUILDINGS

In the United States the trend is towards a simple type of functional building to house the medical school, so that as much money as possible should be reserved for salaries, equipment, and maintenance of the staff; good equipment takes precedence over beauty in buildings. The pace of development has made formerly outstanding buildings obsolete within a few years; and many planners now favour construction in which the plumbing and electric wires are placed, as far as possible, in outside walls, with the inner walls mere partitions no more than one brick thick, so that internal space can be reshuffled according to need. Rochester medical school exemplifies this type of design.

Schools are now commonly designed with an eye to compactness. Thus laboratory, ward, and teaching unit are in the closest physical proximity; within a single building one whole floor is devoted to each department; so a few steps or a few seconds in the lift separates one department from another. There is pronounced disinclination to separate the different departments in distinct institutes; the emphasis is on the unity of medicine and on easy passage between the clinical and preclinical departments. Indeed at some centres the medical school and hospital occupy contiguous structures, and each floor in the medical school houses a department appropriate to the adjacent hospital department on the same floor; thus the department of physiology and the department of internal medicine, with its wards, occupy the same floor of one large building and are divided simply by a door which joins rather than separates the two departments. This is a more powerful object-lesson to the student than a host of words on the value of the physiological approach in medicine. In some hospitals the appropriate outpatient department is incorporated on the same floor as the double units which have described; the outpatient department is then sepa by only a few feet from the wards; so the staff engaged inpatient treatment and teaching is immediately a sible to outpatients. The outpatient department sho be designed to incorporate preventive medical ideas practice.

PREVENTIVE MEDICINE

Many leaders in the medical field in the United States as elsewhere, are convinced that preventive medicine social medicine or community medicine (the best t is still a matter of dispute) will dominate medicine the future. The fact is that most medical students dominated by the dazzling influence of the professors internal medicine and surgery, with their emphasis diagnosis and curative treatment; and it is the ambition of most to set up in private practice (of high standard) the larger cities among the upper middle class. At pre this kind of practice seems to bring the richest financ and social rewards. The medical student looks upo preventive medicine as a kind of appendage, grafted o to the medical course proper, which he must suffer unt he passes the hurdle of his final examinations.

The attempt should be made to permeate the whole of the medical faculty with the preventive medicine idea. An integral part of the work of each existing division of medicine should be in the preventive field. The professor of preventive medicine should participate as an equal in medical ward rounds and indicate wherever appropriate what measures could have prevented the onset of disease and how to prevent recurrences. At Beth Israel Hospital Boston, there is a regular medical social ward round in which a senior resident, the intern, the head of th social-service department, medical students, and social workers participate.

The medical course from the very beginning shou be impregnated with the ideas and philosophy of pre tive and social medicine. The student should be brou up along these lines and not suddenly confronted w a special course which seems to be of no real interest many members of the medical faculty. The outpatie department should be linked up with the health centr and preventive medical teaching should be dominant the outpatient clinic. Field trips should form an integr part of the course. Stress should be laid also upon th family as a health unit.

All progressive departments of pædiatrics have lo been preventive medicine minded, but there is room f preventive medicine in other departments. Nutrition and psychiatry, bacteriology and tropical medicine spring immediately to mind. As Dr. Abel Wolman has put it: "The medical school should make the medical student feel that he is a junior fellow worker in a public health undertaking."

NURSING

It has been aptly said that the efficiency and knowledge of the American nurse are beyond dispute, but not beyo criticism. There is some truth in the statement th American nurses, after an expensive college educat take a long and arduous nursing degree course only become, on qualification, too superior to engage ordinary nursing procedures or work in the remoter smaller hospitals.

What I have seen in England, America, and Jerusale convinces me of the soundness of the plea of THE LANCE that all nurses should be given the same basic training of two years, and that all who pass such training succes fully should be given the designation of, say, qualifie nurse—"Q.N." *The more ambitious nurses and the mo* able nurses will then go on to take higher qualificatio —e.g., university degree, or State registration. This w attract into nursing, and keep in nursing, many girls wh are angels at the bedside but fools in chemistry.

lumn are the estimates of alkali reserve after seven ys' treatment; in the second, two months later. cluded within the second series are 3 patients who had ceived sulphetrone for seven days only. The estimates re made within 30 min. from freshly drawn blood ntrifuged under paraffin; the CO_2-capacity was termined by the volumetric method of Van Slyke. It ill be seen that there is no significant change in the O_2-combining capacity of the plasma after protracted eatment with sulphetrone.

Sulphetrone is well tolerated if the exhibition of the ug is gradual. Nevertheless, during this period of ljustment mild symptoms of toxicity are seen (Madigan 948)—slight nausea, mild headache, and difficulty in ading. These may be associated with the physiological ccommodation the patient is called on to make in alkali serve. The symptoms are relieved best by sodium icarbonate and not so well by lactate or citrate. The icarbonate ion (HCO_3)— may therefore be involved.

ABSORPTION AND EXCRETION

Experiments on mice and dogs in which single small or rge doses were given showed that, after a certain point reached, large increases in dose do not lead to either higher blood-sulphetrone level or increased absorption. imilar observations have been made with the more omplex sulphonamides at somewhat higher doses. The abbit is anomalous, for increase in dosage increases e absorption of sulphetrone and its concentration in the lood. In dogs the same total amount of sulphetrone iven in divided doses at intervals of a few hours led to higher blood-sulphetrone level than when given as a ingle dose. A similar effect was seen in man in ten xperiments restricted to 96 hours. The results of an xperiment on dogs in which sulphetrone was injected rst into the large and then into the small intestine, the leocæcal junction having been tied, support the view hat absorption is largely confined to the small intestine. t follows that optimal conditions of absorption are likely o follow uniformly divided doses.

ulphetrone and Metabolism Products in Urine and Fæces

Two female tuberculous patients given sulphetrone ere the subject of drug-balance experiments during a ontinuous period of twelve months. The intake of ulphetrone averaged 6·5 g. daily; the amounts of ulphetrone in urine and fæces were estimated. As already ndicated, the recovery of sulphetrone from urine was good, 90–95%, but only 75–82% could be obtained from fæces. Sulphetrone in the fæces does not indicate only the amounts which remain unabsorbed, since some secretion takes place into the bile and from the ileum. It is impossible to relate the amount of sulphetrone in the urine to the amount absorbed, for still other channels of excretion are open to it. After the initial period of adjustment, as little as two-fifths, and later as much as three-fifths, passed through the kidneys; as much as two-fifths and as little as a fifth was recovered from the fæces.

ABLE I—OXYGEN-CAPACITY OF BLOOD OF 8 TUBERCULOUS PATIENTS TREATED WITH SULPHETRONE. TWO NORMAL ESTIMATES ARE INCLUDED. THE PRESENCE OR ABSENCE OF METHÆMOGLOBINÆMIA IS INDICATED

Case no. and sex	Oxygen found (vols. %)	Hb % (Haldane)	Oxygen calculated from Haldane value (vols. %)	Methæmoglobinæmia (spectrometric)
Normal:				
1 (F)	15·3	82	18·6	0
2 (F)	16·4	90	18·3	0
Tuberculous:				
3 (F)	12·0	86	14·0	—
4 (M)	10·6	76	13·5	—
5 (F)	16·3	90	18·1	0
6 (M)	16·3	86	18·8	0
7 (M)	14·5	94	15·4	0
8 (M)	16·7	88	18·8	0
9 (M)	14·8	88	16·6	0
10 (M)	12·8	92	13·8	0

TABLE II—EFFECT OF SULPHETRONE IN PLASMA CO_2-COMBINING CAPACITY. IN VOLUMES % IN MAN

	Oct. 8, 1947		Dec. 8, 1947		Dec. 8, 1947	
Case no.	Blood-sulphetrone (mg. per 100 ml.)	Carbon-dioxide capacity of plasma (vols. %)	Blood-sulphetrone (mg. per 100 ml.)	Carbon-dioxide capacity of plasma (vols. %)	Normal patient	Carbon-dioxide capacity of plasma (vols. %)
1	3	61·7	7·5	64·3	A	64·8
2	5	61·1	8·1	63·0	B	65·5
3	4	63·6	5·3	64·9	C	58·0
4	4	63·0	7·2	58·6	D	65·5
5	4	53·0	*2·0	58·6	E	57·2
6	..	..	4·0	55·4	F	63·9
7	..	..	4·1	57·3	..	..
8	..	..	3·2	56·7	..	..

* Drug being withdrawn.

The urine of animals and man receiving sulphetrone contains a diazotisable substance which, when coupled with naphthyl-ethylenediamine, forms a dye with an absorption similar to that of sulphetrone. Heating with N/1 hydrochloric acid for 30 min. does not increase the amount of diazotisable material; thus there is probably no conjugation. The concentration of sulphetrone in urine is high—usually 10 to 20 times that in the blood.

The urine of patients treated with sulphetrone is a dark smoky-brown. The pigment may be separated chromatographically on a column of activated alumina (Brockmann: Messrs. Savory and Moore).

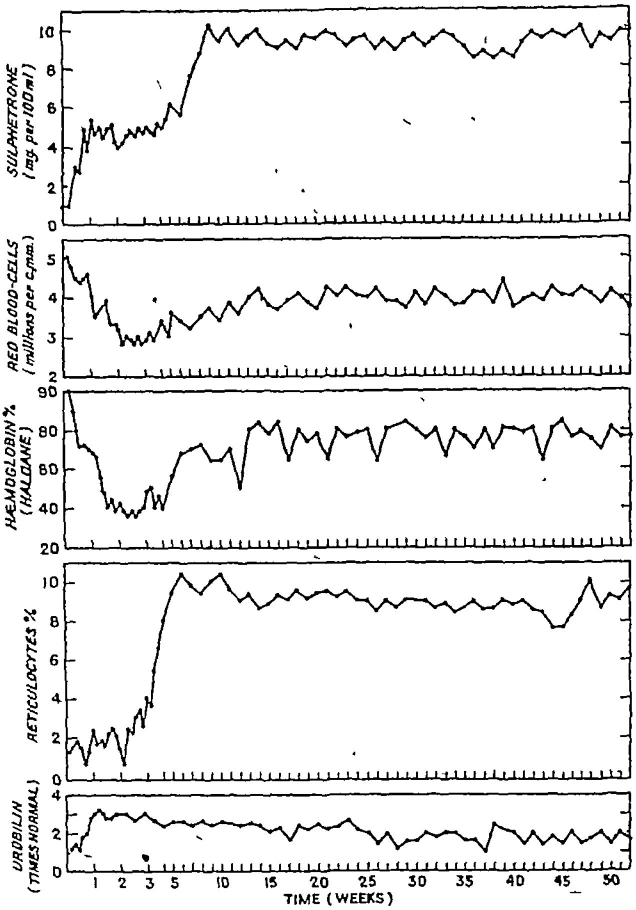
Most of this pigment separates as a dark brown 1½ in. band at the top. After washing with a similar volume of distilled water about 95–97% of the total diezotisable material passes through the column. The pigment may now be developed with 0·5% hydrochloric acid to give a blue-violet narrow band, followed closely by a mauve-pink broader band, with brown (bile) pigments left behind. The violet-blue pigment is soluble in 0·5% hydrochloric acid and, diazotised and coupled, appears to account for about 2% of the total sulphetrone in the urine. The mauve-pink solution in hydrochloric acid couples with difficulty; calculated as sulphetrone it appears to account for about 0·5% of the total.

It is interesting to speculate on the part played by these dyestuffs in the leaden-blue coloration of sulphetrone-treated patients excreting these dyes in their urine. The dyes appear to be condensation products of two or more molecules of sulphetrone, which, it will be recalled, loses alkali in the blood-stream, probably by just such a condensation procedure.

Renal Clearance

Sulphetrone is excreted by the kidney very fast. In rabbits the clearance was 58% of that of creatinine, or two or three times as fast as that of sulphanilamide, while in the dog the clearance was five times as fast as that of sulphanilamide (Brownlee et al. 1948).

The opportunity arose in a patient, repeatedly catheterised for the diagnosis of renal tuberculosis, to determine the clearance-rate of sulphetrone by direct comparison with sulphanilamide. Both drugs were given intravenously in a dose of



Typical response in man treated with sulphetrone 7·5 g. daily for 52 weeks, with increments of iron and fresh yeast to diet. Urobilin was estimated spectroscopically (Watson 1936).

observed. Consistent with the reticulocytosis observed in man there was an increase in the primitive rod cells of the bone-marrow.

The range within which the differential red bone-marrow counts fell in 11 tuberculous patients treated with sulphetrone was as follows:

		%			%
A	Polymorphs ..	3·5–34·4		Lymphocytes ..	3 8–22·8
	Metamyelocytes	0·0–33·4		Monocytes ..	0·4–10·8
	Myelocytes ..	1·8–11·5		Plasma cells ..	0·2– 2 0
	Promyelocytes	1·2– 4·0	B	Normoblasts ..	24·0–37·5
	Myeloblasts ..	1·2– 4·0		Erythroblasts ..	0·4– 1·0

The proportion of cells of the myeloid series (A) to nucleated red cells (B) is 1·24–2·5 to 1. This falls within the limits for normal marrow counts (Young and Osgood 1935). Estimates made on 2 of the 11 patients before treatment started gave ratios of 6·4 to 1 and 9·25 to 1.

Abnormal Blood Pigments

The blood of animals and man containing therapeutic concentrations of sulphetrone is usually dark brown, and the pigment is restricted to the red cells, even though sulphetrone is distributed within plasma and cells. Examined spectrometrically (Beckman) the blood may show no specific absorption characteristic of known abnormal blood pigments. In a proportion of cases, which may be as high as 20%, the specific absorptions of methæmoglobin (630 mμ) may be detected. Sulphæmoglobin (618 mμ) is absent. Methæmoglobin may be identified visibly by spectroscope but only in the strongest solutions of laked blood which will just transmit light. When it is present, calculations from the extraction coefficients of the wave-length corresponding to oxyhæmoglobin (540 mμ) and methæmoglobin (630 mμ) suggest that the amount present is about 4–12% of total hæmoglobin.

Blood containing concentrations of sulphetrone above 10 mg. per 100 ml. may contain additional abnormal blood pigments. For example, of 904 spectrometric estimates in this category 23 were abnormal: 18 contained sulphæmoglobin, and 5 appreciable amounts of methæmoglobin. In all other cases in which sulphæmoglobinæmia was observed in patients with blood-sulphetrone levels below 10 mg. per 100 ml. other drugs were implicated, phenacetin five times and methylacetanilide once. An additional abnormal pigment may be identified by a generalised absorption in the area 600–620 mμ. This may be a hæmoglobin-sulphetrone complex or a hæmoglobin-sulphetrone degradation product.

Oxygen-capacity of the Blood.—Whatever the precise nature of the abnormal pigment, its ultimate importance depends on whether or not there is variation in the oxygen-carrying capacity of the blood. A series of [illegible] patients, with blood-sulphetrone levels of 7·4–9 2 mg. per 100 ml., were observed for ten weeks in which five repeated estimates were made of the oxygen-capacity of blood, together with spectrometric estimates. The analyses were made in the constant-volume Van Slyke apparatus. In this small series the estimates of oxygen capacity were lower than normal in 5 cases, though associated with the presence of methæmoglobin in only 2 (table I). The rate of oxygen (air) uptake was always slower than in normal blood.

Blue Coloration of Patients.—Associated with these facts is the clinical observation that many patients treated with sulphetrone show a leaden-blue coloration of skin and mucosæ. The tint and distribution of the colour are reminiscent of sulphæmoglobinæmia, which, as noted above, is absent. The intensity of pigmentation is not related to the blood-sulphetrone level but is greater during the early period of adjustment. It is less obvious in the young, and most pronounced in those with l vital capacity. There is at the same time a quantity violet-blue dye in the urine. Clinically the condition do not contra-indicate the exhibition of sulphetrone.

Specific Toxic Effects

Sulphetrone shares with the sulphonamides the property of causing hyperæmia and hyperplasia of the thyroid gland in laboratory animals. The hyperpl is thought to result from diminished synthesis of thyroid hormone. The tests showed sulphetrone to be the le and sulphaguanidine the most toxic, with sulphadiazine intermediate. The effect has not been observed in man.

Effect on Alkali Reserve

The lack of acute toxicity and the low chronic toxicity, with freedom from the characteristic nervous sequelæ seen in experiments on animals after the administration of diaminodiphenylsulphone, make it clear that sulphetrone is not degraded to any extent to diaminodiphenylsulphone in the body.

A point which must not be overlooked is the possible hydrolysis of one or more of the four sulphonated side-chains and animal experiments were made to study this p (Brownlee et al. 1948). Simple hydrolysis with liberation sodium acid sulphate appeared likely, but experiments rabbits given sulphetrone by mouth and parenterally, and dogs given sulphetrone parenterally, showed increased in the blood. Comparison with the effects of administe alkali parenterally showed the increase in alkali reserve to consistent with the liberation of one molecule of sodi hydroxide from each molecule of sulphetrone. This w involve the production of a condensation product of sulphetrone, and there is experimental evidence in man pointing the excretion of a coloured complex of this kind in the urin

It is significant that tests made on rabbits given sulphetrone for long periods showed the animals to be capable of establishing an equilibrium in plasma-alkali balance.

The alkali reserves of untreated and treated tuberculous patients are compared in table II. In the fir

CHEMOTHERAPY OF PULMONARY TUBERCULOSIS WITH SULPHETRONE

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THIS report records the results of a trial of 'Sulphe-ne' mainly in pulmonary tuberculosis. Though the al has been proceeding for three years, progress has n slow partly because of the need to ascertain the icity of sulphetrone and partly because of the difficulty ountered in assessing results.

Knightswood Hospital receives notified cases of lmonary tuberculosis from all parts of the city of asgow. There is some selection before admission, that a high proportion of the patients have fairly vanced disease and are regarded as unsuitable for tificial pneumothorax or other active treatment.

TABLE I—RESULTS OF TREATMENT WITH SULPHETRONE

oup	Type of tuberculosis	Slight improvement	Definite improvement	No change	Worse	Died	Totals
I	Meningitis	—	—	—	—	7	7
	Miliary ..	—	—	1	—	4	5
	Broncho-pneumonic	—	—	—	—	4	4
II	Advanced bilateral pulmonary	—	1	4	4	6	15
III	Moderately advanced pulmonary	8	15	5	5	3	36
IV	In children	1	15	1	1	1	19
V	Pleurisy with effusion ..	2	6	1	—	1	10
VI	Genito-urinary	1	1	—	—	—	2
VII	Skin ..	—	2	—	—	—	2
	Totals ..	12	40	12	10	26	100

uch cases seemed most suitable for the trial of a new rug because: (I) they would be likely to show any toxic ffects more readily; and (2) chemotherapy would not e influenced by other methods of treatment. From ich cases patients were selected for study whose eneral condition, after careful review, was regarded as tisfactory.

There were three main stages in the trial. At first e drug was given to patients with tuberculous eningitis to gain experience in its use. Since all such ses pursue a uniformly fatal course, it was thought stifiable to adopt a varied dosage so as to observe the stribution of sulphetrone in the body and the toxic fects to which it might give rise. Thereafter our st patients with pulmonary tuberculosis were treated. t first we selected patients with advanced disease d a poor prognosis. Later we began to select patients ith less advanced lung disease, including several ildren. Because of the care required in clinical anagement it was never possible to have large numbers nder treatment at the same time.

GENERAL MANAGEMENT AND CLINICAL CONTROL

All patients received the same basal treatment—etetic and symptomatic. To begin with, rest in bed as enforced during sulphetrone therapy, but gradually this rule was relaxed and patients were allowed up on the usual indications. Some have continued treatment as outpatients.

To estimate the progress of the tuberculosis the following examinations were carried out regularly: radiography, examination of sputum for *M. tuberculosis*, measurement of erythrocyte-sedimentation rate (E.S.R.), weight, and the usual physical examination.

Before the start of treatment each patient had a blood examination which included estimation of the hæmoglobin, total red-cell and white-cell counts, and a differential white-cell count. The hæmoglobin and the red-cell count were repeated frequently (at least once a week), since it was believed that the most serious toxic effect was exerted on the red cells. Continuation of treatment and dosage largely depended on the results of these examinations.

Sulphetrone was given by mouth four-hourly in tablets each containing 0·5 g. When treatment was started, a daily dose of 3 g. was usually prescribed, and this was continued for at least a week. Thereafter the daily dose was gradually increased in an attempt to secure blood-sulphetrone levels of 5–8 mg. per 100 ml. In most adults a daily dose of about 9 g. was sufficient, but occasionally doses of 12–15 g. a day were given. In the early stages of the experiment the blood-sulphetrone level was estimated every second day, but latterly a weekly estimation was considered sufficient.

Sulphetrone is exceedingly soluble and is more rapidly eliminated from the kidneys than are the sulphonamides. To secure satisfactory blood-sulphetrone levels it was found necessary to limit the fluid intake to three pints a day. Alkali was given with each dose and, to prevent anæmia, most of the patients received iron.

As our knowledge of the drug and its effects increased, only one major change was made. At first, because of the fear of toxic reactions, we had limited the period of treatment to six weeks; after a rest from sulphetrone for a similar period treatment was continued. The duration of each course of treatment became gradually longer as we saw the need for sustained therapy; until latterly we tried to keep the patient continuously on sulphetrone.

RESULTS

Table I summarises the results obtained. The different groups in the table are analysed in more detail as follows:

Group I.—Sulphetrone exerted no beneficial effect on the course of tuberculous meningitis, miliary disease, or bronchopneumonia. Meningitis followed the usual downhill progression to death in three or four weeks. Some of these patients were given very large doses of sulphetrone and attained higher concentrations in blood and spinal fluid than were regarded, from experimental studies, as inhibitory. Organisms were sometimes isolated by guineapig inoculation from spinal fluid containing an adequate concentration of sulphetrone.

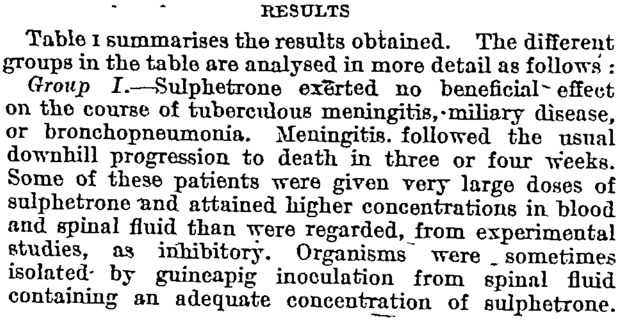
(a) (b)

Fig. 1—Bilateral pulmonary tuberculosis with left pleural effusion (case 6): (a) before treatment; (b) after treatment with sulphetrone.

0·05 g. per kg. and five estimates were made at intervals of 30 min. The mean clearance for sulphanilamide ± S.D. was 12·2±2·4, whereas for sulphetrone, tested after an interval of eight days, it was 62·1±11·3.

It seems that, in man, tubular resorption of sulphetrone is small, and that the rate of clearance is about four times as fast as with sulphanilamide.

TABLE III—PENETRATION OF SULPHETRONE INTO VARIOUS TISSUES IN MAN, EXPRESSED AS MG. PER 100 ML. OF BLOOD OR OTHER FLUID AND AS MG. PER 100 G. OF TISSUE.

Tissues	Case 1	Case 2	Case 3	Case 4	Case 5
Blood	12·4	4·1	..	22·4	17·7
Plasma	8·1	2·2	..	13·3	10·3
Corpuscles	4·3	1·9	..	9·1	7·4
Cisternal fluid	1·8	1·3	1·6	3·7	2·9
Bile	140·0	19·9	130·0	254·0	171·4
Liver	14·0	11·5	3·7	30·0	29·4
Kidney	17 6	20·2	23·7	97·5	73·1
Spleen	30·5	9·8	2·4	40·0	46·0
Normal lungs	10·4	7·4	4·9	37·0	27·2
Caseous lungs	..	..	7·3	..	44·2
Bone-marrow	..	0·0	0·2	..	0·4
Heart muscle	14·0	6·0	..	..	19·2
Striated muscle of thigh ..	..	17·8	..	42·7	28·0
Ileum	21·0	..	22·7	..	22·1
Cerebral hemispheres ..	..	5·9	2·0	6·1	3·7
Peritoneal fluid	66·0	..	..	..	27·4
Pericardial fluid	6·3	..	..	..	8·2
Mediastinal glands	..	5·6	..	..	..
Pus from mediastinal gland..	..	16 0	..	..	..

DISTRIBUTION OF SULPHETRONE IN TISSUE

Sulphetrone rapidly penetrates all tissues except brain, but it appears in cerebrospinal fluid more slowly than do sulphonamides. The tissues of animals show similar concentrations whether the sulphetrone is given in a sufficient dose intravenously or by mouth over a period of ten weeks (Brownlee et al. 1948). In experiments on animals concentrations of sulphetrone in liver, kidney, and spleen are always greater than in plasma; the same is true for man (table III). The relation between absorbed sulphetrone, sulphetrone in transport, and sulphetrone in kidney clearance does not seem to be a simple one, and conditions other than the concentration of sulphetrone in the plasma appear to coöperate in determining the amount in the tissues. Plasma-sulphetrone levels obtained in nephrectomised rabbits are many times those seen in normal rabbits, and many times the level attained in other tissues. The concentrations in the bile of both normal and nephrectomised animals are very high; in the normal animal the concentration in bile is about twelve times the plasma value and must be considered to be sulphetrone in transport, so that biliary excretion makes a significant contribution to the clearance of the drug.

The study of the distribution of sulphetrone in the tissues in man has necessarily been confined to necropsy specimens. Cases 1, 2, and 3 of table III show the distribution of sulphetrone in different tissues when the blood-sulphetrone was at a therapeutic level, at death after tuberculous meningitis (2 cases) and hæmoptysis (1 case). Cases 4 and 5 show the distribution of sulphetrone in different tissues after excessively high and long-maintained blood-sulphetrone levels caused by constipation allowing sulphetrone to accumulate in the small intestine. In both cases the blood-levels were maintained at 17·5 mg. per 100 ml. for more than five days. D from anoxia followed from the inability of the red to transport oxygen.

SUMMARY

The chemical and physical properties of sulphet and its estimation in body fluids are described.

The acute toxicity of sulphetrone in experimenta animals is very slight. No acute toxic effects have observed in man.

The chronic hæmatotoxic effects in rabbits and in ma include a hæmolytic anæmia, an anæmia of iron lack, a an anæmia of nutritional origin.

Sulphetrone has a goitrogenic effect similar to that o sulphonamides, but this is only slight in experimenta animals and has not been observed in patients receivin the drug.

Sulphetrone, given by mouth or parenterally raises th alkali reserve of the plasma of rabbit and dog. Th probable mechanism is discussed. Given over a lon period it brings about some tolerance. It is thought th the period of adjustment seen during the first three wee of sulphetrone therapy is associated with adjustments o alkali reserve. The minor discomforts encountered durin this period are relieved by bicarbonate, but not so wel by other alkalis.

Though very soluble in water, sulphetrone is slowly absorbed from the intestinal tract—most from the small intestine, little from the large.

Sulphetrone is cleared by the kidney very quickly, and fluid must be limited to maintain blood-sulphetrone concentrations; there is also a substantial excretion into the bile and to a lesser extent into the ileum. The drug is not conjugated; so there is no danger of crystaluria.

Sulphetrone penetrates all tissues, except brain, ver rapidly. It passes into the cerebrospinal fluid mor slowly than do sulphonamides.

Thanks are due to Dr. A. I. Ross, of Farnborough Co Hospital, who was responsible for the bone-marrow biop Dr. T. Anderson and Dr. D. G. Madigan for permis to draw on their clinical necropsy findings; Dr. E. I. S for some of the oxygen-capacity and spectrometric observa- tions; Dr. C. L. Oakley for the histological reports.

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“. . . If the availability of medical care were to raise th level of health in industry, and if the assurance of unem ployment pay, old age pensions and funeral expenses lift such a load of worry from our minds that we slept bett and tackled our work with more nervous vitality, then o production would go up. If it went up sufficiently, we m carry all the extra clerks, extra doctors, and other wo required for social security and dance under the load, n while enriching ourselves more than ever in other ways. A very different result is also possible: for a population which everyone felt certain that he could not sink m below a tolerable minimum of comfort and in which th higher prizes of property and independence had been curtailed in size and number, might see not more but less reason t devote itself to productive effort. . . . Now that we ar embarked on the scheme, we must work and hope for th former result, but had better be on our guard against th latter. In the end, it will prove to be a social advan only if it marks a turning-point in our conception of societ and social purpose.—*New English Weekly*, July 15, p. 1

BLE II—CASES OF MODERATELY ADVANCED PULMONARY TUBERCULOSIS WHICH IMPROVED UNDER SULPHETRONE THERAPY

	Age (years)	Extent of disease	X-ray evidence of cavitation	Preliminary observation (wks.)	Progress during this time	Total sulphetrone (g.)	Duration of treatment (wks.)	Weight Bef. Treatment st. lb.	Weight Aft. Treatment st. lb.	E.S.R. (mm. in 1st hr.) Bef. Treatment	E.S.R. (mm. in 1st hr.) Aft. Treatment	Sputum Bef. Treatment	Sputum Aft. Treatment	Progress
	18	Rt: infiltrative and active Lt: infiltrative and effusion at base	+	Nil	Nil	960	26	7 12	10 3	50	7	Cop. ++	Nil G.L. +	Definite progress; had lt. thoracoplasty and discharged well; still well 16 mos. after discharge
	22	Rt: apex to 3rd c.c. active clinically Lt: upper ½ slight activity	−	27	Impr.	1059	12	8 8	10 12	10	6	Nil −	Nil G.L. −	Definite improvement maintained on drug; still well 1 yr. 4 mos. after discharge; inactive
	40	Widespread fibrous disease in both lungs; left worse than right	+	4	Impr.	4588	70	9 2	9 9	49	3	Cop. +	Sm. +	General condition improved greatly; discharged well; improvement not maintained as outpatient
	52	Rt: pleural thickening at apex; infiltration and cavitation Lt: fibrosis at root	+	5	Impr.	2700	40	8 0	8 4	22	5	Cop. +	Nil G.L. +	Definite fibrosis of lung; sputum very scanty; condition i.s.q. 9 mos. later
	20	Rt: apex to 4th c.c. active Lt: 2nd to 4th interspace active	+	Nil	Nil	4200	62	9 1	9 2	19	2	Cop. ++	Sm. +	Slow but definite progress; sputum less
	23	Rt: active upper ½ Lt: pleural effusion +; whole lung active	−	21	Impr.	2508	34	9 13	9 10	2	1	Mod. +	Nil G.L. −	Disease became inactive; well after a year
	22	Rt: apex to 4th c.c. active Lt: 1st to 3rd c.c. active	+	10	Impr.	2047	31	9 8	9 8	5	2	Sm. +	Nil G.L. +	Improvement continued; no sputum on discharge; condition i.s.q. 9 mos. later
	24	Rt: upper ½ active Lt: lesion at 2nd interspace	−	6	Sl. impr.	1940	28	9 7	9 7	16	2	Sm. +	Sm. G.L. −	Disease became inactive; deteriorated since discharge
M	19	Rt: apex to 4th rib active Lt: apex to 4th rib active	+	4	Impr.	3003	34	8 12	11 5	6	5	Mod. +	Sm. +	Definite and very good progress
M	16	Rt: whole lung active and cavitation Lt: apex and 3rd to 5th c.c.	+	8	Sl. impr.	2394	34	8 9	9 2	50	3	Cop. +	Sm. +	Very satisfactory progress; had phrenic crush; thoracoplasty being considered
F	28	Rt: normal Lt: pleural effusion lower ½; consolidation of L,	−	3	Worse	1536	30	6 6	8 12	105	2	Nil Pl. fl. +	Nil Pl. fl. − G.L. −	Toxæmia and confusion abated after drug started; well 6 mos. later; inactive
M	36	Rt: apex Lt: apex clinically active	−	4	Sl. impr.	1060	20	11 3	11 3	3	5	Nil G.L. −	Nil G.L. −	(Hæmoptysis before admission); increased fibrosis; clinically inactive
F	32	Rt: apex to 2nd rib active Lt: apex to 3rd c.c. active; cavitation	+	2	Worse	987	20	8 1	9 2	56	2	Cop. ++	Sm. − G.L. +	Lesion on rt. looks healed; lt. apex more quiescent; still cavitation
F	20	Rt: mid-zone active Lt: 2nd to 3rd interspace active	−	2	Sl. impr.	434	19	6 12	7 0	10	3	Nil G.L. +	Nil G.L. −	Disease became inactive; condition i.s.q. 6 mos. later
F	22	Rt: calcified root glands Lt: 2nd to 3rd interspace	−	4½	Nil	710	20	7 1	6 12	57	2	Sm. G.L. +	Nil G.L. −	Disease became inactive and is i.s.q. 10 mos. later
M	17	Rt: apex active Lt: ½ collapsed, with adhesions; fluid at base to 4th c.c.	+	1½	Nil	2678	46	6 10	8 1	24	18	Cop. ++	Sm. − G.L. −	Rt. apex became quiet; drug used along with thoracoplasty and achieved quietening of lt. lung disease; still drainage slight
M	24	Rt: apex to 3rd c.c. active with cavitation Lt: apex to 2nd c.c. and base	+	14	Sl. impr.	1518	27	6 5	7 6	100	72	Cop. ++	Sm. +	Radiological and clinical improvement up to 3 mos. before death from gonococcal panophthalmia; deterioration of chest 3 mos. before
M	23	Rt: 2nd to 4th interspace active Lt: apex to 5th cavitation, active	+	14	Impr.	1133	14	10 6	10 4	30	20	Cop. +	Sm. +	Slight improvement, but after this course patient wished to be treated as outpatient and deteriorated
M	17	Rt: nil abnormal detected Lt: apex to 5th rib infiltration ++	+	Nil	..	2436	34	8 13	9 6	21	10	Mod. +	Sm. +	Progress satisfactory but slow; cavity became apparent; later had thoracoplasty; condition good
F	16	Rt: basal pleurisy, upper lobe active disease Lt: apex active	−	12½	Nil	441	18	6 8	7 1	125	100	Sm. +	Nil −	Lung disease became inactive, but also had renal disease; urine + for *M. tuberculosis*
M	35	Rt: upper ½ active Lt: upper ½ active cavitation, basal adhesions	+	10	Sl. impr.	1662	30	9 4	9 2	15	5	Sm. +	Sm. +	Slight improvement, but disease still active
F	21	Rt: apex and 1st to 3rd ribs active Lt: massive, 1st to 3rd ribs active	+	2	Nil	441	21	6 13	7 4	18	10	Sm. G.L. +	Sm. G.L. +	Chest improved and became quieter, but treatment stopped as patient went out at own request
M	31	Rt: upper ½ cavitation between 1st and 2nd ribs Lt: normal	+	4	Sl. impr.	2604	30	8 11	8 13	40	7	Mod. +	Sm. +	Some fibrosis in right lung

G.L. = gastric lavage. Pl. fl. = pleural fluid. c.c. = costal cartilage. Sl. impr. = slightly improved.
Cop. = copious. Mod. = moderate amount. Sm. = small amount

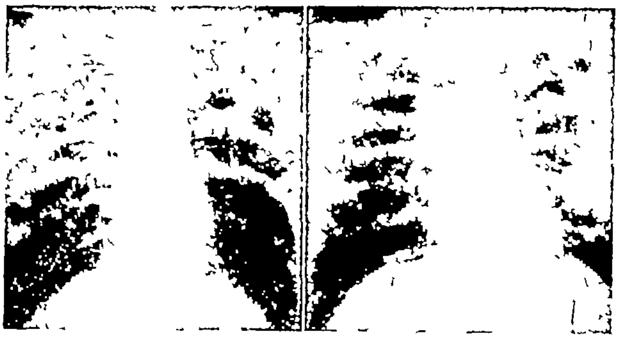

Fig. 2—Bilateral pulmonary tuberculosis (case 9): (a) before treatment; (b) after treatment with sulphetrone.

Similarly, in what might be termed acute tuberculosis there was no apparent intermission in the progression of the disease.

Group II.—All of the patients included in this group showed extensive tuberculosis of both lungs. There was usually considerable cavitation. The prognosis from the beginning was bad, and it was unlikely that any form of treatment would be beneficial. This part of the experiment was to a large extent planned to show that even patients with advanced disease and in poor condition could tolerate sulphetrone reasonably well, provided adequate precautions were taken. Because of the toxæmia already present, however, the chemotherapy of such patients was more difficult to control and, in some, sulphetrone was not well tolerated. A hæmoptysis, for example, always caused anxiety, since the sudden depletion of hæmoglobin, added to anæmia due to sulphetrone, might produce dangerously low hæmoglobin levels. Only one of these patients showed any benefit from the treatment. The patient, a female aged 23, had extensive disease throughout the left lung with cavitation, and active infiltrative disease in the upper third of the right lung. Under sulphetrone therapy there was considerable improvement in the lesion on the right side, which was eventually considered to be arrested. A thoracoplasty has now been performed on the left side, and the result at present is excellent.

Group III.—This group comprises patients with pulmonary tuberculosis whose prognosis was initially more hopeful, though in some of them the disease was fairly extensive. In most of them both lungs were affected, and in some there was radiological evidence of cavitation. Some of them were chosen for study with the limited objective of checking a more recent spread into one lung from a more chronic disease in the other. There were 36 patients in this group, and 23 of these showed improvement after a period of sulphetrone therapy. Relevant details of these 23 patients are given in table II, which shows that many of the patients were under observation for a short period before beg treatment, and that in some there was no improve during this time. All received adequate and pro treatment, and in 8 of the cases radiological and ba logical examination supported a belief that the tu culosis had been arrested. In 2 other patients (ca and 16) the disease in one lung was arrested and a tho plasty was performed on the opposite side. They in excellent condition. The radiograms before and treatment from 3 of these patients (cases 6, 9, and are shown in figs. 1–3.

Group IV.—The 19 patients included in this were all under 15 years of age. They were distrib in age-groups as follows: 4 aged 1–2 yr. (1 did improve); 2 aged 2–3 yr.; 5 aged 3–5 yr., 5 5–10 yr. (1 did not improve and 1 improved slightly and 3 aged 10–15 yr. (1 did not improve). There many different forms of tuberculosis. The diagnosis based on radiological and clinical findings, and many of these children, before treatment start *M. tuberculosis* was found in stomach washings. Opin is divided on the question of prognosis at this period life, but it is generally agreed that age is of prima importance. No patient in this group was discharg from hospital unless the radiological picture was norm and three consecutive samples of fasting stomach ju

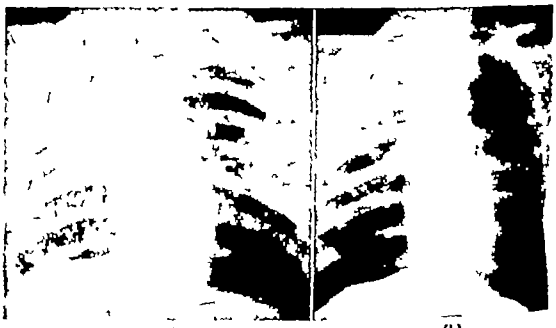

Fig. 3—Bilateral pulmonary tuberculosis (case 10): (a) before treatm (b) after treatment with sulphetrone.

did not show *M. tuberculosis* on inoculation into gui pigs. Of these 19 patients 15 were discharged and m therefore be regarded as having had their tubercul arrested. They have been followed up for four eighteen months since discharge, and all have remai healthy. The duration of stay in hospital was as follow

No. of days in hospital	100–199	200–299	300–399	400–499	500
No. of children	2	5	6	1	1

Average stay in hospital: 302 days

Radiograms from one of these patients are shown fig. 4. This case is of interest because, after a p liminary period of observation. the condition defin deteriorated (fig. 4a a After a period of su trone therapy lastin weeks he was disch with the tubercu arrested (fig. 4c). A ne re-examination show that the condition was quiescent.

Group V.—The patients in this gr were chosen for st because they all definite evidence of tu culous pleurisy w effusion. Stomach wash

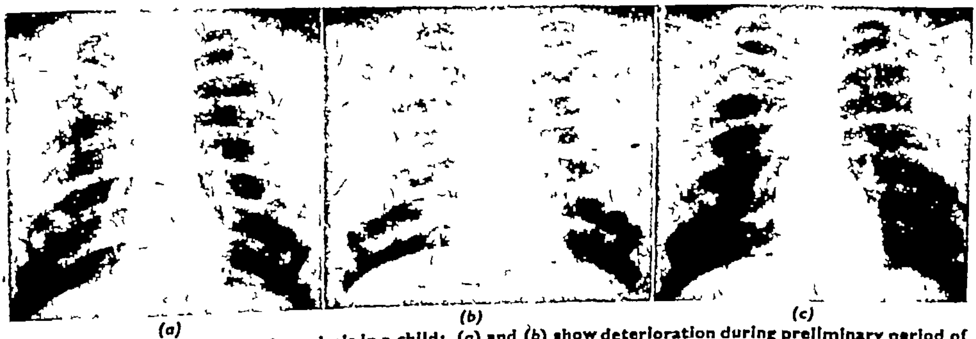

Fig. 4—Bilateral pulmonary tuberculosis in a child: (a) and (b) show deterioration during preliminary period of observation; (c) disease arrested after 45 weeks' sulphetrone therapy.

ɔn under observation for three years; thoracoplasty ʒ been done on the side with the extensive disease, d the lesion on the opposite side remains inactive.

In some cases, however, there has been no improve- ɔnt under sulphetrone therapy, although our experience ggested that the patients would benefit from treat- ɔnt. In some of these we cannot explain the failure.

The absence of controls may be regarded as a serious ılt in this trial. But it would have been at least very ficult to obtain untreated patients equivalent in all pects to those treated. The amount of care required clinical management, especially at the beginning, ıde it impossible to conduct a trial along the usual es of treating alternate cases. In tuberculosis, leed, such a trial would have to include a very large mber of patients if all the factors liable to affect the urse of the disease were to be balanced in the two oups.

Our results show that chemotherapy with sulphetrone ın be safely applied to patients with pulmonary tuber- losis, and can exert a favourable effect on certain pes of the disease. The results give some basis for e belief that control of the disease by chemical means possible.

We wish to thank Dr. R. D. Stuart, city bacteriologist, asgow, who carried out the examinations on samples of stric washings by guineapig inoculation; the late Dr. F. L. nderson, consultant radiologist, Glasgow Public Health partment, for assistance in reading the radiograms; Dr. F. escott and Dr. G. Brownlee for advice and criticism; and ssrs. Burroughs Wellcome & Co. Ltd., for supplies of lphetrone.

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OBSTETRICAL EVALUATION OF THE PUBIC ARCH

A CLINICAL METHOD

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The use of radiology in obstetrics has led to increasing tention being paid to the shape and size of the pelvic tlet in relationship to dystocia. Various expedients ve been devised for clinical measurement of the outlet, which the best known is that proposed by Williams 909), following the technique originally introduced by ien (1896), and described in all standard textbooks. is involves the simultaneous measurement of (*a*) a line ning the two ischial tuberosities, and (*b*) the distance tween the midpoint of this line and the sacrococcygeal nt—i.e., (*a*) the intertuberischial and (*b*) the posterior gittal diameters.

The practical difficulties in making these measurements e considerable. I have maintained (Morris 1947) that, view of these difficulties, it is justifiable in clinical tlet pelvimetry to concentrate on one measurement ich can be made with reasonable accuracy—i.e., the ortest distance between the symphysis pubis and the ral tip—plus an approximate estimate of the distance ween the ischial spines and of the amplitude of the bic arch. It is in connexion with the amplitude of e pubic arch that suggestions are put forward here.

It is difficult to devise a satisfactory method of measur- the pubic arch, whether in the dried pelvis, clinically, radiologically. Moir (1946) has proposed the radiological method of superimposing a transparent model of a fœtal head on the X-ray image of the bones, and similar techniques have been described independently by Allen (1947) and Morris (1947). I use a circular transparency with a diameter of 9·3 cm., corresponding to the biparietal diameter of the fœtal head. It is possible by this means to estimate the degree of probable bony obstruction by noting the size of the gap between the disc and the apex of the pubic arch (figs. 1 and 2). An average pubic arch may show a gap of 1 cm., but anything greater than this is regarded as indicating a narrow arch.

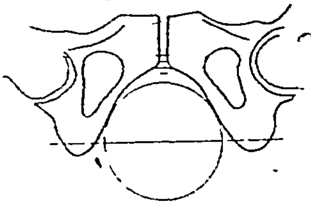

Fig. 1—Average pubic arch.

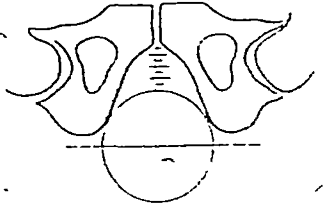

Fig. 2—Narrow pubic arch.

It occurred to me that this method might be adapted to the clinical determination of the size of the pubic hiatus, and trials were undertaken with a disc 8 cm. in diameter, a measurement somewhat arbitrarily chosen, since it was intended to apply the instrument to the external aspect of the pubic arch, and it was obviously necessary to allow for invaginated soft tissues intervening on each side between the edge of the disc and the conjoint rami.

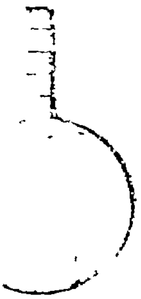

Fig. 3—Phosphor-bronze disc with centimetre scale attached, for measuring pubic arch.

CONSTRUCTION OF DISC

Originally a wooden disc was constructed, having a diameter of 8 cm., with one surface completely flat and the other very slightly convex, the thickness of the disc being about 2 mm. at its periphery and 7 mm. in the centre. A short strip of wood bearing a centimetre scale

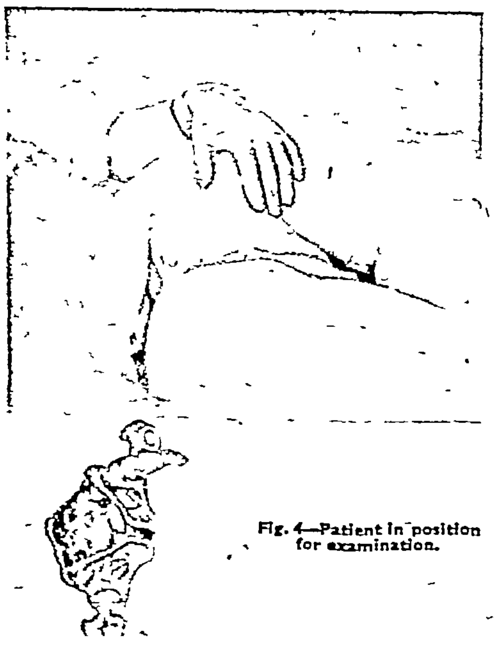

Fig. 4—Patient in position for examination.

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* In receipt of a grant from the Medical Research

were examined by guineapig inoculation in 9, and 7 proved positive. In 4 patients obvious intrapulmonary disease was also present. The only factors which can be adduced as possible evidence of satisfactory treatment are the rapidity of discharge from hospital and the permanence of cure. The average duration of stay in hospital of those who were discharged was 202 days. The cases have been reviewed from five to thirty months after discharge, and none of the cases classified as cured has shown a breakdown.

Groups VI and VII.—The cases of genito-urinary and skin tuberculosis are too few to be analysed. We were impressed with the rapidity and completeness of the cure in cutaneous tuberculosis.

TOXIC EFFECTS

Anæmia.—We have already mentioned that the most common toxic effect was on the red blood-cells resulting in anæmia. All patients showed a fall of about 2 g. per 100 ml. in the hæmoglobin concentration during the first five or six weeks of treatment with sulphetrone. The cause of this fall has been investigated by one of us (S. J. S.) and will be the subject of a later report. The fall was less abrupt when the patient was started with a low dosage of sulphetrone and the daily amount was slowly increased. After the initial drop the level either rose very slightly or remained steady at the low level. As a rule throughout treatment the hæmoglobin was fairly steady at 9–11 g. per 100 ml. The fall in hæmoglobin was accompanied by a parallel decrease in the red-cell count. No change was observed in the white-cell count of any of the patients.

Cyanosis was also evident in all patients. The colour varied from a rather intense purple to a paler lilac or mauve. It reminded us of the intense cyanosis due to sulphæmoglobinæmia occasionally seen with sulphonamide therapy, but spectroscopic examination of the blood showed that this was not present. Patients varied in the extent to which they became cyanosed, but in general the degree ran parallel with the blood-sulphetrone level, deepening as the level rose. The combination of cyanosis and pallor gave the patients a rather striking and ill appearance. When treatment was stopped the cyanosis was slow in disappearing and usually remained evident for seven to fourteen days.

Headache, Nausea, and Vomiting.—These were the commonest subjective complaints affecting about half the patients. Sulphetrone has an unpleasant soapy taste, and some patients found it difficult to take. That this did not constitute an insuperable difficulty is shown by the fact that some patients have been continuously on sulphetrone for over a year. In one respect, however, these effects were important. As a rule patients did not eat so well and either gained no weight or lost a little while on sulphetrone.

Other Effects.—In 10 cases the patients developed a sensitisation rash similar to that occasionally seen with sulphonamide therapy. In 6 of them the rash was accompanied by drug fever. In some of these cases treatment was continued with due care and the rash gradually disappeared. One other patient developed an exfoliative dermatitis accompanied by an acute hæmolytic anæmia and died. Occasional effects observed temporarily were itching of the skin, tingling of the fingers, and blurring of vision. As is the case with sulphonamides, the children tolerated sulphetrone very well and gave rise to least anxiety.

In view of the occasional severity of the toxic signs patients under treatment require careful and continuous supervision. The daily dose of sulphetrone should always be started at a low level (3 g. a day or less) and increased gradually week by week. At all stages of treatment close attention must be paid to two examinations: the hæmoglobin must not fall below 7 g. per 100 ml.; and the blood-sulphetrone level must exceed 8–9 mg. per 100 ml. We found toxic eff much less likely in patients gradually accustomed the drug. We do not wish, however, to exaggerate incidence of toxic reactions, for our experience indic that, given in the way described, sulphetrone is unduly dangerous but merely demands reason caution.

DISCUSSION

In considering the chemotherapy of tubercul some general conclusions from the sulphonamide ther of acute bacterial infections are worth notice, they may have a more general application.

(1) Sulphonamides are most effective when the numb infecting organisms is small (Colebrook et al. 1936). T sulphones might be expected to show a similar prefere In many cases, particularly of extensive tuberculosis, number of bacteria present may be very large and m therefore hinder effective action.

(2) Effective sulphonamide therapy depends mainly on a b teriostatic action; the host is left to overcome the infective ag himself. Even in acute bacterial infections cases are encou tered in which, despite adequate chemotherapy, the results less successful. It has been argued that this poorer respo may be due to a poverty in the host's defensive mechanis (Anderson 1943, Department of Health, Scotland, 194 In acute tuberculosis it is not so much the increased virulen of the bacterium that explains the rapid course of the disease as the breakdown of the host's resistance, and in such cases his sulphone therapy may be expected to fail. The uniformly bad results obtained in group I do not seem to us unexpected and may well be explained in this way.

(3) It is a general clinical finding that the presence of pus invalidates treatment with sulphonamides. It has bee shown that pus and necrotic tissues contain anti-sulphonami substances which counteract effective action (MacLeod 19 It seems probable that the pus of tuberculous cavities cont similar substances capable of inhibiting the bacterio effect of the sulphones. Our own clinical observations in present study support this view, for cases with cavitat disease have not, on the whole, responded to treatm The patients in group III who responded most satisfact were those in whom cavitation was not obvious.

(4) Chemotherapy cannot repair damaged lung ti Where a profound pathological change has already ta place the most that can be done is to prevent further exten of the disease.

Tuberculosis thus presents a problem in chemothera which is not yet completely soluble. For in many ca even though the drug inhibits the parasite successfu and enables the patient to halt new invasion and perha to heal recent disease, the patient is often left with lung so seriously damaged from old disease that healing beyond his capacity. When the lesion is unilateral surgery may achieve collapse of the damaged lung an thus encourage healing. But with bilateral disea this may not be practicable and the continued presen of active chronic disease will leave the patient liable hæmorrhage and bronchogenic spread. In such ca sulphetrone therapy may sometimes be justified the limited objective of arresting disease in one (where it is recent and infiltrative) to permit surg attack on the more extensively diseased opposite In 4 of our cases, by bringing more recent disease o opposite side under control, sulphetrone rendered patient suitable for thoracoplasty. But as a rule regard cases with extensive fibrocaseous tuberculosis unsuitable for chemotherapy.

The type of lesion which seems to us most likely benefit from such treatment is the early infiltra lesion. Our results in group III are, we believe, improvement on what could have been expected fr ordinary rest in bed. Nearly all of these patients w regarded as unsuitable for more active treatment. T tuberculosis was apparently arrested in 8 of the patient and they have so far remained healthy. One has n

;. 7 shows the findings in respect of an ample arch. ;. 8 shows those in a patient with a narrow arch.

RADIOLOGICAL CHECK

At the beginning of the investigation 20 patients were amined both clinically and radiologically, and the easurements were found to correspond extremely sely. In no case was the divergence between radiogical and clinical measurements greater than 0·5 cm.; d, when the arches were divided into two groups fined as narrow (gap more than 1 cm.) and ample ip 1 cm. or less), the correspondence was exact. larger series is now being accumulated.

CONCLUSIONS

With the instrument and technique described it is ssible to detect narrowing of the pubic arch and ughly to assess its degree. But it is not suggested at such a rough method of examination is enough to ime any precise prognosis of the outcome of labour, iich may or may not be influenced by narrowing of e pubic arch, depending on various factors discussed sewhere (Morris 1947). However, this is a much more curate method of evaluating the obstetrical calibre of e pubic arch than any of the standard subjective timations depending simply on palpation, and at the ry least it enables the obstetrician to detect the cases which the pubic arch requires radiological investigation.

I am indebted to Messrs. Archibald Young and Co. for nstructing the metal gauge

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THE LARYNGEAL SWAB IN EARLY AND ONVALESCENT CASES OF PULMONARY TUBERCULOSIS

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THE demonstration of tubercle bacilli in discharges om the respiratory tract is the most convincing evidence pulmonary tuberculosis and a valuable index of ive disease. When such material is spontaneously pectorated, microscopical and cultural examination is ually adequate for diagnosis. In certain types of se, however, sputum is scanty or absent or, if present, not available for examination because it has been allowed.

Several methods of isolating the tubercle bacillus in e absence of expectoration have been devised. Cultural amination of fæces, of material coughed on to a ryngeal mirror, of laryngeal swabs, of cough ates, and bronchial lavage have been tried but have t been generally adopted in routine practice. Examition of the contents of the fasting stomach is now garded as the most effective and reliable means of olating tubercle bacilli in patients who do not expecrate. The results obtained by this method compare vourably with those of sputum culture (Robinson and unn 1943, Webster 1943), and the method is of ndoubted value in diagnosis and as a test of quiescence sputum-free and sputum-negative patients. The collection of stomach contents, however, is difficult in outpatients; hence a simpler method of obtaining material for bacteriological examination from such outpatients and from hospital inpatients requiring repeated examinations is needed. We have consequently investigated the value of laryngeal swabs for this purpose.

In 1905 Blume first used the laryngeal swab as an aid to diagnosis in human tuberculosis. He limited his examination to direct microscopy of smears made from the charged swabs. It was not until 1931 that culture of the swab on egg media was tried. Grass (1931) took swabs from 22 cases of pulmonary tuberculosis and isolated tubercle bacilli on culture of 11 of them; only 4 of these swabs were positive on direct microscopy. Dornickx (1937), Bezançon et al. (1937), and Böhm and Ekstein (1938), using Grass's technique or some modification of it, obtained satisfactory results in patients who did not expectorate. Thus, of 271 sanatorium patients with no sputum or with negative sputum, Böhm and Ekstein (1938) obtained positive culture of laryngeal swabs from 56 patients. The use of the laryngeal swab in this country has been reported by Nassau (1941) and Clark et al. (1945). Nassau obtained a positive result in 44% of 273 sanatorium patients who did not expectorate. The technique used in our investigation was a modification of Nassau's method.

METHOD

The swab consists of a piece of nickel or 'Nichrome' wire 9 in. long and $^{1}/_{16}$ in. in diameter, bent at an angle of 120° an inch and a half from the end. Cotton-wool is wrapped round this end of the wire, which has been flattened and spirally twisted to hold the cotton-wool firmly. Each swab is placed in a boiling-tube (7 × 1 in.) the open end of which is plugged with cotton-wool. The tubes with swabs in position are sterilised in the autoclave. Immediately before use the swab is moistened with sterile distilled water.

The swab may be passed into the larynx either with the guidance of a laryngeal mirror, or blindly. For both methods the patient is seated and supplied with a piece of gauze with which to hold his tongue fully protruded. The operator, if using a mirror, sits opposite the patient and with the aid of the mirror guides the tip of the swab over the epiglottis into the larynx. If working blindly, the operator stands at the side of the patient and passes the swab through the mouth backwards and downwards strictly in the midline; the manœuvre is facilitated by asking the patient to take panting breaths. Reflex cough usually develops as the swab enters the larynx, and absence of cough suggests that the swab has not entered the larynx. In the present series two swabs were taken from each patient.

In the laboratory sufficient 10% H_2SO_4 (v/v) is added to the boiling-tube to cover the cotton-wool on the swab. After 5 min. in acid the swab is removed, excess of fluid is expressed on the side of the tube, and the swab is transferred for a further 5 min. to a second boiling-tube containing a similar amount of 2% NaOH. The swab is again drained of excess fluid and is rubbed over the surface of a slope of Löwenstein-Jensen medium. The inoculated medium is incubated at 37°C and examined at weekly intervals. A positive report may be given when characteristic growth of tubercle bacilli is recognised. This may take from two to six weeks' incubation. Cultures which remain negative at the end of six weeks are discarded.

It has been our practice to carry out confirmatory tests on all tubes showing growth, to exclude saprophytic mycobacteria and non-acid-fast contaminants. A film of the growth is stained by the Ziehl-Neelsen technique and, if acid-fast bacilli are present, is subcultured on Löwenstein-Jensen and nutrient-agar slopes, which are incubated at 37°C and room temperature. If the morphological and/or cultural characters of an acid-fast organism are in any way atypical of *M. tuberculosis*, or if the bacteriological result is at variance with clinical findings, a guineapig-virulence test is carried out. All acid-fast organisms thus tested have proved to be human type *M. tuberculosis* and pathogenic to guineapigs. Contamination with non-acid-fast organisms (diphtheroids, coliforms, and moulds) took place in less than 2% of all cultures.

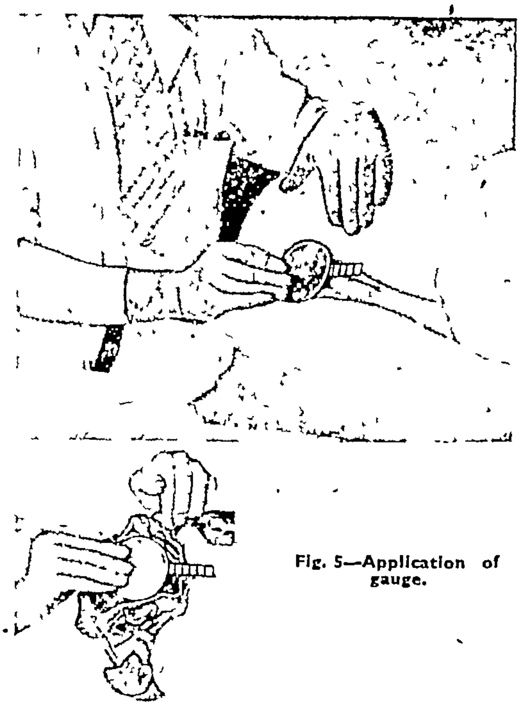

Fig. 5—Application of gauge.

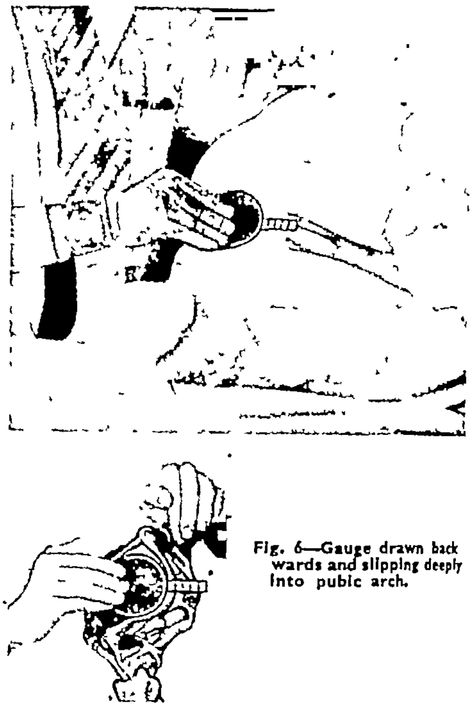

Fig. 6—Gauge drawn backwards and slipping deeply into pubic arch.

was glued into a slot on the flat surface of the disc, so as to protrude from the circumference of the disc at one side.

Later, a similar disc (fig. 3) was cast in phosphor-bronze, with a brass centimetre scale attached. This has been satisfactory in practice and, having the advantage of being readily sterilisable, it has taken the place of the prototype.

METHOD OF USE

The patient is placed in the left lateral position with the thighs hyperflexed, the right thigh being slightly abducted and held steady by the patient herself or by an assistant (fig. 4).

The convex surface of the disc is applied over the vulva (fig. 5), with the scale directed forward in the midline. Gentle pressure being made against the vulva, the disc is drawn backwards, until it slips between the conjoint rami, when it instantly invaginates the perineum deeply (fig. 6). The end-point is easy to observe and is usually quite precise. If any doubt exists, the disc may be pushed forward, when, in avoiding the resistance of the pubic rami, it rises to lie superficial to the arch once

The assessment of the capacity of the pubic ar made by palpating anterior to the disc at the moment when the rami are tangential to its circumference. It easy, with the fingers invaginating the soft tissues either side of the vulva, to determine whether or not the circumference of the disc extends as far forwards as the pubic symphysis, and, if not, to estimate the amount the gap by means of the centimetre scale provi

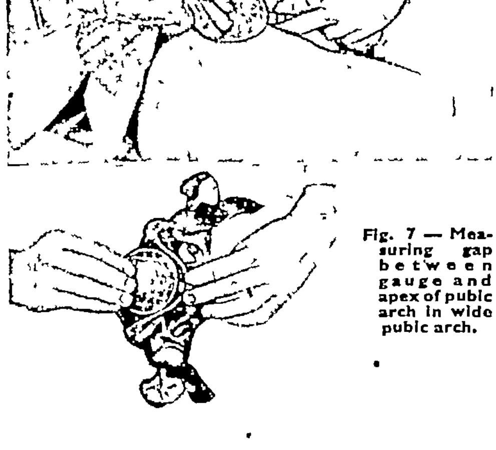

Fig. 7 — Measuring gap between gauge and apex of pubic arch in wide pubic arch.

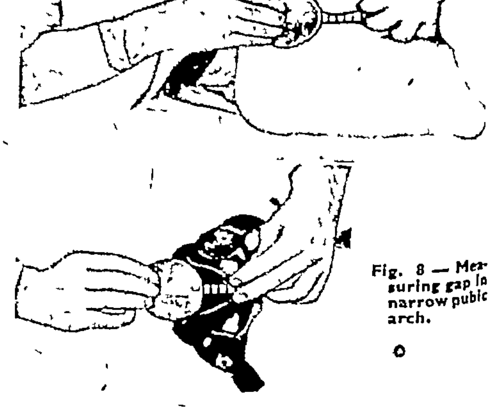

Fig. 8 — Measuring gap in narrow pubic arch.

attention has been paid to the presence or absence sputum. The cultural examination of sputum is erior to either of these methods. Specimens of sputum n 96 cases of minimal tuberculosis detected by mass iography were cultured for tubercle bacilli. Laryngeal ıbs from the same 96 cases were similarly examined. results are given in table III (these cases are ependent of the cases quoted in earlier tables).

Acid-fast bacilli had been found in very few of the itive cases on examination of a stained film of sputum. e results strongly suggest that, if sputum is obtainable l is cultured, there is little point in taking laryngeal abs. A similar conclusion was reached by Clark et al. 45).

DISCUSSION

In comparing two methods of isolating an organism main consideration must be the efficiency of the thods in yielding positive results. If, however, the ference between the methods in this respect is small, her factors may properly be considered.

Advantages of Gastric Lavage over Laryngeal Swab. Gastric lavage gives a slightly higher proportion of sitive results, at least for patients in hospital. Of r 201 patients 45 were positive by laryngeal swab and by gastric lavage. These results approximate those f Hounslow (cited by Clark et al. 1945), who obtained 7 positive by laryngeal swab and 33 by gastric lavage n 99 cases examined by both methods. Minor advantages f gastric lavage are that material is available for direct mear examination and guineapig inoculation. Further, ositive cultures from gastric contents tend to give a eavier growth with more colonies than do positive ultures from laryngeal swabs.

BLE II—RESULTS OF LARYNGEAL SWABS AND GASTRIC LAVAGE IN 101 OUTPATIENTS

—		Gastric lavage		Totals
		+	−	
Laryngeal swab	+	5	8	13
	−	6	82	88
Totals ..	..	11	90	101

No. bacteriologically positive by one or both methods = 19.

Advantages of Laryngeal Swab over Gastric Lavage. —In the ward, and more especially in outpatients, the aryngeal swab is greatly preferred by both patient nd operator. Specimens can be obtained at any time f the day without special preparation; the taking of wo swabs can easily form part of a routine clinical xamination. Patients are willing to allow further wabs to be taken at subsequent examinations, whereas ome would refuse to attend for a second gastric lavage. inally, a specimen can almost invariably be obtained ith a laryngeal swab, whereas gastric lavage is occaionally a failure; even after sucking a benzocain ablet some patients cannot swallow a Ryle's tube. In he laboratory the treatment of the laryngeal swab is impler, shorter, and is the same for all swabs, taking 0 min. for each, whereas the treatment of gastric ontents takes at least 30 min., the time varying ith the volume and consistence of the specimen. aryngeal-swab cultures are less often contaminated (1·5% ontaminated, compared with 3·3% of contaminated astric-lavage cultures), and the colonies are more easily ecognised, because the surface of the medium is clear of ebris.

Time between Collection and Culture.—The exposure f tubercle bacilli to gastric contents for 12–24 hours t room temperature may lead to false negative results Kramer 1946, Sprick and Towey 1946), and laryngeal swabs sent through the post give fewer positive results than those cultured at the time of collection (Clark et al. 1945). Both swabs and lavages should therefore be treated and cultured as soon after collection as possible.

Significance of Positive Finding.—To say how much importance should be attached to a single positive result would require a much larger series with a long follow-up. Attention may, however, be directed to the following facts: (1) Of 71 cases positive by one or both methods only 27 were positive by both. These included a high proportion of those cases in which a positive result might have been anticipated on clinical or radiological grounds. (2) In a separate series of 28 cases positive by laryngeal swabs both swabs were positive in only half the cases. These results suggest the desirability of repeated examination by all methods available, if the maximum of positive results is to be obtained.

TABLE III—COMPARISON OF RESULTS OBTAINED BY CULTURE OF SPUTUM AND OF LARYNGEAL SWAB

—		Sputum		Totals
		+	−	
Laryngeal swab	+	13	3	16
	−	15	65	80
Totals ..	..	28	68	96

SUMMARY

In 100 inpatients and 101 outpatients with radiological evidence of pulmonary tuberculosis but with microscopically negative or no sputum, a search was made for tubercle bacilli by culture of fasting gastric contents and of laryngeal swabs.

Gastric lavage gave slightly superior results for inpatients; there was no difference between the proportions of positive results obtained by the two methods in outpatients.

Patients greatly prefer the laryngeal swab to gastric lavage. Laryngeal swabs can be taken as part of a routine examination without special attendance or preparation.

The laboratory technique for laryngeal swabs is simpler and less time-consuming than that for gastric lavage.

It is not suggested that these methods should take the place of the cultural examination of expectorated sputum, which has been shown in a comparative series to be much superior to the laryngeal swab.

It is a pleasure to acknowledge the help and encouragement we have received from Dr. Robert Cruickshank, director of the Central Public Health Laboratory. Our thanks are also due to the Prophit Committee, Royal College of Physicians, and Dr. W. Snell, medical superintendent, Colindale Hospital.

Since completion of this report Dr. A. G. Hounslow and Mr. G. Usher have reported similiar findings (*Tubercle*, Feb. 1948, p. 25).

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OUTLINE OF INVESTIGATION

The investigation was done to provide comparative data on the culture of laryngeal swabs and gastric contents for the isolation of tubercle bacilli; 200 patients (half of them outpatients and half hospital inpatients) were subjected to both laryngeal swabbing and aspiration of stomach contents. Specimens were collected from each patient on the same day or within a few days of each other. Gastric contents were aspirated with a Ryle tube in the morning from the fasting stomach after a period of coughing and swallowing. The material was dispatched to the laboratory as soon after collection as possible and there homogenised and concentrated by a modified acid-peroxide-iron method (*Mon. Bull. Min. Hlth E.P.H.L.S.* 1945, 4, 202). Briefly, this technique consists of adding to the juice an equal amount of a solution of ferrous sulphate in 10% sulphuric acid and 1 vol.% hydrogen peroxide. The acid-peroxide-iron mixture is allowed to act on the gastric juice for 10–20 min., during which time the mucus in the specimen is dissolved. After centrifugation the deposit is washed in sterile Ringer's solution and inoculated on to two Löwenstein-Jensen slopes. As with laryngeal swab cultures, the slopes were examined at weekly intervals and, if negative, discarded after six weeks' incubation. All positive cultures were subjected to the confirmatory tests already mentioned.

Clark et al. (1945) advised the taking of two swabs, since they found a considerable proportion in which only one swab of the pair was positive. Our results confirm the desirability of taking two swabs at each examination. Of 28 cases positive on culture 12 were positive from both swabs, 9 from the first swab only, and 7 from the second swab only.

RESULTS

The results in outpatients and inpatients are considered separately, since the types of case investigated and the conditions of the experiment are not strictly comparable.

Inpatient Series

The patients were all male and were under treatment in a tuberculosis hospital. The types of case varied considerably: 42 of the 100 cases were classed as A cases at the time of the examination, the remainder either B1 or B2. Some were patients recently diagnosed in whom activity was doubtful; others had completed or were having collapse therapy. In all cases the sputum had been negative on one or more occasions to a routine monthly smear examination. The comparative figures for culture of laryngeal swabs and gastric contents are given in table I. It will be seen that gastric lavage yielded 10% more positive results than did laryngeal swabs. The difference between the two is not statistically significant but suggests that, for inpatients, examination of stomach contents was a more sensitive method than examination of laryngeal swabs.

The clinical assessment of this group showed that some cases could be classed as frankly active on radiological and clinical grounds, whereas others were regarded as quiescent. There was an intermediate group in whom the activity was doubtful, either because collapse therapy had only recently been instituted or because of some other factor (such as pleural adhesions) which prevented adequate collapse of the diseased area of lung. The bacteriological findings in these three groups were as follows:

	No. of cases	*No. bacteriologically positive by one or both methods*
Radiologically active ..	.. 25 ..	.. 21
Probably active ..	.. 46 ..	.. 22
Quiescent	.. 29 ..	.. 9

The 4 radiologically active cases that were negative to both tests were positive on sputum culture.

Of this series, 55 patients had received collapse the and 19 of these could be regarded as effectively tre on clinical grounds, but 4 of the 19 gave positive g lavage cultures and 2 positive laryngeal-swab cult The 6 positive cases had disease in both lungs, and 3 of them bilateral collapse had been induced. In 2 o cases the patients were judged unfit for further col therapy, but in one case the positive culture was a the reasons for inducing collapse of the other lung.

Tubercle bacilli were isolated on culture of g contents and/or laryngeal swabs from 22 of 34 pati in whom collapse treatment was regarded as ha been only partially effective at the date of investigat

Outpatient Series

The outpatients were all cases detected by m radiography and so were free of symptoms severe enou to cause them to consult their doctor. Ages ran from 15 to 44 years, and females greatly outnumb males, mainly because more females were being rad graphed. With two exceptions the lesions were radi logically minimal as defined by the National Tubercul Association (1940). The results are given in table II

The results for the two methods do not differ signi cantly from each other. The outpatients showed a high proportion of positive cultures from laryngeal swa than from fasting gastric contents. The difference i small and most likely due to chance variation. Since the work was done in outpatients there was inevitably an interval for travelling between rising and the collection of the specimen. This was usually at least half an hour and often more. Gastric movements in this period would possibly cause some of the contents to pass int the duodenum; relatively small volumes of fastin contents were obtained.

The series is far too small for conclusions to be dra about the value of such tests in the prognosis of m lesions detected by mass radiography. However t position some nine months after the work was comp was as follows:

> Of the 82 negative by both methods when first seen 4 w assessed active on other grounds, 6 showed definite sign activity within nine months, and 8 were possibly a within nine months—i.e., a maximum of 18 out of 82 sho signs of activity.
>
> Of the 19 positive by one or both methods 2 had cav (the cases mentioned above as being other than mini and 12 showed definite evidence of activity either at the examination or within nine months—i.e., at least 14 out gave radiological or clinical confirmatory evidence of act Of the remaining 5 patients, 4 women were advised to treatment because of the radiographic appearance single positive bacteriological finding, and 1 man, aged has remained at work clinically well, radiologically st and without tubercle bacilli again being isolated.

TABLE I—RESULTS OF LARYNGEAL SWABS AND GAST LAVAGE IN 100 INPATIENTS

—		Gastric lavage		Totals
		+	−	
Laryngeal swab	+	22	10	32
	−	20	48	68
Totals ..	..	42	58	100

No. bacteriologically positive by one or both methods = 52

COMPARISON OF SPUTUM CULTURE WITH LARYNGEAL-SW CULTURE

The main object of this paper is to compare the cultu examination of fasting gastric contents with that laryngeal swabs for isolating tubercle bacilli. Accord

In November, 1946, she had several septic spots on her ce and the eye condition was very pronounced. In March, 947, she had a slight antral infection accompanied by a are-up in the eyes. In September she noted that she had ores on her fingers, and that when they were bad the eyes ere bad also. In October she had a stye on the right wer lid and a septic spot on her face, both yielding a rofuse growth of hæmolytic *Staph. aureus*, and at the ame time there was an acute exacerbation of the eye ondition.

In view of this cumulative evidence it was considered robable that the conditon was due to the staphylococcus, nd she was admitted to hospital and given penicillin 25,000 nits three-hourly intramuscularly to a total of 1,000,000 nits. At the end of the course the inflammation had ıbsided, and there has been no recurrence in the subsequent ree months except for a slight flare-up when she had a bad old in December.

Though the eye condition reacted to the larger doses f tuberculin, there can be little doubt, in view of the evere exacerbations when she had local staphylococcal ıfections, and the complete and lasting subsidence of he condition after treatment with penicillin, that the ause was an allergic reaction to the staphylococcus.

Medical Societies

EDINBURGH OBSTETRICAL SOCIETY

Surgery in Cervical Carcinoma

AT a meeting on May 19, with Dr. W. F. T. HAULTAIN, he president, in the chair, the rôle of surgery in the reatment of carcinoma of the cervix was discussed by Ir. CHARLES READ. Opinion, he said, was divided on he relative merits of radiation and radical surgery in tage-1 and stage-2 cases. There was little debate in espect of stage-3 and stage-4 cases, which were generally ınsuitable for surgery. While in many clinics the Vertheim operation had been abandoned when radiotherapy had been generally established, at the Chelsea Hospital for Women this operation had been performed ontinuously since Mr. Bonney introduced it in 1907, lthough lately cases had been selected rather carefully. Even the surgical enthusiast must admit that the results of radiotherapy compared favourably with those of urgery; but it might well be asked whether any of the atalities after radiotherapy could be avoided by judicious urgical procedures.

Mr. Read suggested that there were seven indications for a surgical attack upon cervical carcinoma: 1) radio-resistance proved clinically or cytologically; 2) columnar-celled carcinoma of the cervix; (3) vaginal-vault stenosis; (4) large fibroids or ovarian cysts complicaing the growth; (5) salpingitis with cervical cancer; 6) refusal of radiation by the patient; and (7) pregnancy complicating cervical carcinoma. Previous irradiation, ıe said, increased the technical difficulties of the Wertheim operation: but this operation was justifiable in proved adioresistant cases, for at the Chelsea Hospital the ive-year survival-rate was 44·4% in 34 stage-1 and 20 stage-2 growths. He had found that the incidence of gland involvement was roughly as follows: stage 1, 20–25%; stage 2, 30–35%; stage 3, 40–50%; and stage 4, over 60%. It appeared that treatment by adium alone, using only vaginal applicators, could ıever give adequate radiation to the lymphatic field. Thus there seemed to be a place for iliac lymphadenectomy in stage-3 cases which had been cured ocally by radium; and such a procedure could well oe extended to include stage-2 cases and selected cases n stage 1.

Mr. Read discussed the technique of the Wertheim operation. He referred especially to lymphadenectomy early in the operation, leaving the iliac and obturator lymph-node chain attached to the uterus throughout; to the need for removal of at least the upper half of the vagina; and to the use of plasma or blood-transfusion. He reported an incidence of postoperative urinary fistulæ of 3·1%.

Prof. ROBERT MCWHIRTER said that his own opinions were governed not only by technical considerations but also by certain general principles. Of these he placed first the need to consider each case of cancer individually, and to treat the patient and not the tumour. The prime object should be to make her more comfortable, and any treatment which cured the cancer without achieving this end was a failure.

The maximum distance from the cervical canal at which radium might be expected to be effective was 3 cm.; growths which extended beyond that distance were insusceptible to radium. The tumour lethal dose varied, and some tumours might justifiably be described as radioresistant; but the most important limiting factor was the restricted striking distance of radium. For improved assessment of radiosensitivity a new histological approach was needed. Possibly observation of the effects of irradiation through successive biopsies might prove a valuable field of investigation. It was difficult to envisage any great increase in radium range in the near future, apart possibly from improved applicators with more efficient screening of the bladder and rectum; dosage was restricted chiefly by the need to avoid damage to these organs.

When radium treatment was first supplemented with X rays, the whole pelvis was irradiated; and not uncommonly necrosis resulted in tissues which had already received a high dosage from radium. It became obvious that if X-ray treatment was to be really beneficial, it must be closely aligned to the radium treatment. Cases with cells just outside the effective range of radium were far more likely to benefit from X rays than cases with cells far out in the pelvis, for in this advanced condition there were often also distant metastases. In an attempt to align the two methods of treatment, the X-ray fields were planned from radiographs showing the position of the radium in the uterus: but with vaginal packing the uterus might be greatly displaced to one or other side of the pelvis and it might be considerably displaced upwards. These difficulties could be overcome to some extent by special radium applicators, such as those devised by Richards, of Toronto. X-ray therapy alone would remain unsuitable until much more powerful apparatus was introduced.

Professor McWhirter believed that surgery was the most effective method of treating early and localised cancer. Because extensive lymphadenectomy must always remain a piecemeal dissection, he thought it unlikely that this practice would greatly improve the eventual prognosis. He did not believe that an inoperable case could ever be rendered operable by preliminary irradiation, although he believed improvement might be obtained by means of postoperative irradiation with very high voltage X-ray apparatus; and preoperative irradiation might benefit operable cases. In a review made some time ago, the five-year survival-rate in Edinburgh was 29% of all cases referred. In the most recently analysed cases, the five-year survival-rate was 34%. He believed that these figures might be improved by the use of surgery where the disease was early and where the tumour was shown to be radioresistant.

"... Has there occurred, or has there not, so radical a change in world food prospects as to call for a complete reversal of British economic policy? ... The demand that counts is effective demand. The effective demand of the would-be eaters consists overwhelmingly in their capacity to supply things for which the food producers are willing to exchange food ... F.A.O. or no F.A.O., Atlantic Charter or no Atlantic Charter, it is certain that the citizens of the United States, Canada, Argentina, and the other food-producing countries are not going to tax themselves year in, year out, to buy food from their farmers and supply it to Asia gratis. ... In the last resort the British food problem is ... a question not of the availability of food in the world but of Britain's ability to pay for it. ... There is a strong probability that more abundant and cheaper supplies of food will be available for Britain to buy some time before very long; and there is some possibility that food will again become as cheap as it was. But no one can be sure of these things ... and it would be wrong to base an irrevocable policy on one particular reading of them.—*Economist*, July 17, p. 94.

CYSTICERCOSIS CEREBRI MISTAKEN FOR CEREBRAL SYPHILIS

REPORT OF A CASE

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The following case is reported because of the difficulty in diagnosis.

A man, aged 29, had been a regular soldier and had served seven years in India. There was no history of venereal disease. In 1943 he was discharged from the Army because of epileptic fits attributed to cerebral syphilis. Presumably the blood Wassermann reaction (W.R.) was then positive, but there is no record of this, nor of any antisyphilitic treatment. On discharge from the Army the patient reported to the Middlesbrough General Hospital, as he was having repeated attacks of epilepsy.

He had a slurring speech and there was some mental dullness. Both optic discs showed early optic atrophy, but no other physical signs were found. The blood W.R. was negative. In the cerebrospinal fluid (C.S.F.) the W.R. was negative and the Lange colloidal-gold test gave a paretic curve. *Ventriculography by the neurosurgical unit of another* hospital yielded no evidence of cerebral neoplasm.

The patient had three courses of bismuth, each consisting of twelve injections of 0·2 g., without benefit. During this period he was admitted to hospital on several occasions in status epilepticus. A course of penicillin and malaria therapy was begun in August, 1945, but the penicillin course was not completed as the patient refused injections. No improvement followed treatment, and fits were not controlled with phenobarbitone and 'Epanutin.'

On June 18, 1946, the patient was admitted semi-conscious: stertorous breathing; pulse of good volume and tension; nothing abnormal found in heart and lungs; pupils constricted and equal; biceps, triceps, and supinator jerks, knee-jerks, and ankle-jerks present and equal on both sides; abdominal reflexes doubtful; no definite plantar response obtained. By June 21 he had completely recovered consciousness but was rowdy and difficult. Cranial nerves normal; reflexes as before, except that plantar response was definitely flexor on both sides; no sensory loss; and bilateral atrophy of optic discs, worse than on previous examination.

On July 1 the patient had an epileptiform attack, after which he continued to have frequent attacks, localised to the angle of the mouth (right side), about every 3 minutes. There was no loss of consciousness. During this period weakness of the muscles supplied by the right facial and the right spinal accessory nerves developed. These fits were completely uncontrolled with phenobarbitone and epanutin.

Examination of C.S.F. on July 21: lymphocytes 10 per c.mm., protein 80 mg. per 100 c.cm., gold curve 1222221000, W.R. negative, and Kahn test negative. Blood: W.R. and Kahn test negative; white cells 10,600 per c.mm. (polymorphs 79%, lymphocytes 13%, monocytes 1%, eosinophils 7%). The possibility of cysticercosis cerebri was considered, but no nodules were discovered on palpation in any part of the body, and radiography of skull and both thighs did not reveal any calcified ova. Skin complement-fixation test not done.

The patient was discharged on July 30 with a diagnosis of epilepsy of unknown cause. He was not seen again until readmission on *Oct. 13* in status epilepticus. *Generalised* epileptiform convulsions were occurring every 5 minutes and were uncontrollable. He did not recover consciousness, and died on the 16th.

Necropsy.—Dr. W. Goldie reported as follows: "The surface of the brain is studded with considerable numbers of small cysts varying in size from about 5 mm. up to 20 mm. in diameter. The cysts show differing stages of development; most of them are quite translucent and contain clear fluid. The cysts have also invaded the substance of the brain. A typical scolex was demonstrated histologically in one of the cysts. The appearance and size of the cysts are consistent with a diagnosis of cysticercosis, and their situation in the brain would certainly account for the previous history of epilepsy." A careful search of the muscles of the thighs, gluteal region, shoulders, upper arms, and spinal muscles did not reveal any cysticercus ova. No gross changes in any other organs.

MacArthur (1934) pointed out the importance of considering cysticercosis as a cause of epilepsy in persons who have lived in the tropics. The incidence of cases may become greater in this country with the return of troops who have been stationed in the East during the war. Cerebral *cysticercosis, however, does not always* cause epilepsy (Dixon and Smithers 1934, Marsh 1934, Dixon and Hargreaves 1944, Edwards 1946). MacArthur (1934) mentioned that it has been diagnosed as hysteria, cerebral tumour, acute encephalitis, melancholia, delusional insanity, and dementia præcox. Stokes et al. (1945) remarked that, as in the present case, it may have to be differentiated from cerebral syphilis.

The diagnosis is made difficult by the facts that unless the cysts are calcified they cannot be demonstrated by radiography, and, according to MacArthur (1934), both the eosinophilia and the complement-fixation test are unreliable; even during the acute invasion stage an eosinophilia may not be present.

No records of the results of the original blood and C.S.F. Wassermann reactions are available in this case; but, in view of the diagnosis of cerebral syphilis, it is presumed that on the patient's discharge from the Service the blood W.R. must have been positive. If so, the result may have been a biologically false positive, as the Wassermann and Kahn tests after discharge were consistently negative. This emphasises the importance of frequent repetition of serological tests in doubtful cases of syphilis.

A further difficulty in diagnosis in this case was the presence of optic atrophy, which is unusual in cysticercosis *but has been reported by MacArthur (1934)* and Edwards (1946).

My thanks are due to Dr. T. Lloyd Hughes, medical superintendent of the hospital, for permission to publish this case, and to Dr. W. Goldie, pathologist, Public Health Laboratory, Northallerton, for his report and his help in preparing the paper.

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PHLYCTENULAR KERATO-CONJUNCTIVITIS TREATED WITH PENICILLIN

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Phlyctenular kerato-conjunctivitis is agreed to be an allergic condition, the commonest exciting cause being *a tuberculous focus. In the following case Staph. aureus* appears to have been the exciting agent.

In 1930 a girl, aged 5 years, had mild chronic nasal diphtheria and was a carrier for some time, during which she developed phlyctenular kerato-conjunctivitis. She had several relapses of the eye condition until 1942, after which she remained clear until August, 1946, when she had a severe phlyctenular condition in both eyes. From then until October, 1947, the condition was active, varying in severity. There was no sign of active tuberculosis, but the tuberculin test was strongly positive. Treatment with Old Tuberculin was tried, starting with 0·1 ml. of 1 in 1,000,000 solution; 0·6 ml. caused a slight reaction in the eyes, and 0·7 ml. caused a considerable flare-up.

THE LANCET

LONDON: SATURDAY, JULY 24, 1948

Atomic Defence

THE Armed Forces in the United States naturally e their doctors to have a working knowledge of e principles of atomic radiation, the protection of ople handling radioactive materials, the treatment those exposed to radiation, and the possible methods minimising the effects of this exposure The sentials were lately summarised in a symposium[1]; ut when this has been assimilated there remains the uestion, present in everyone's mind since Hiroshima: hat can really be done if an atomic explosion does ccur, by accident or design? King[2] essays an nswer in his article, but it is scarcely an encouraging ne. He admits that there is as yet no satisfactory rotection against the streams of particles and the ays that are the result of an atomic explosion. After uch an explosion there is an innermost area containing lethal concentration of radiation in which it is useless aste of man-power to attempt rescue work. Outside his lethal area, however, much can be done by proper rganisation, and in this organisation doctors have a rominent part to play.

The American commission of investigation found hat 260 out of Hiroshima's 300 doctors were unable o assist in treating the wounded: yet King estimates hat if there was an atomic attack on an American ity at least a thousand doctors would be needed or weeks to treat affected and wounded people, to supervise the decontamination of people and areas, and to advise the military and civilian officials. In King's view this calls for decentralisation. Hospitals and medical centres must be well away from centres of industry and population. Blood-banks form an important part of atomic defence, since blood-transfusion is the only known treatment for radiation sickness; therefore blood-banks must be established —again at the periphery of areas—with enough equipment to give at least a pint of blood to each person in the area served by the centre. Trained teams will be needed to operate these banks and "adequate reserve technicians" should be available. Food and drugs in the affected area will inevitably become contaminated: so stores of non-perishable foods and drugs must be established outside likely areas, preferably in underground shelters. In the Bikini experiment massive doses of penicillin were used, with good results, to prevent infection in the exposed animals; so King would have stores of "huge quantities of antibiotics," known and yet to be discovered, with equipment for their administration, all to be replaced as necessary. Another point to be considered is that water-supplies may be contaminated in reservoirs by radioactive material in rain or carried by the wind; so reserve water-supplies from deep wells or large distillation plants are proposed. Decontamination centres were a familiar part of civil defence in this country: and they would be all the more necessary with atomic radiation, since anyone from a "dirty" area would need to shed all clothing and all personal belongings, scrub down in running "clean" water, and put on fresh clothes The disposal of the "dirty" clothes and water presents peculiar problems, and King suggests that the site of disposal should be in the contaminated area itself. Something can be done to protect the rescue-worker with special clothing and special masks. Masks should be provided for everyone and King would have the population educated in their use beforehand. Real protection could only be obtained in underground shelters with at least 5 feet of concrete for the roof, and since people would have to stay in the shelters until all dust, water, and spray had settled they would have to be properly equipped. Finally there is the question of evacuation of casualties and of population when a town's services have become seriously disorganised. Experience suggests that communications in a large area would be completely disrupted, and in fact it would not be worth evacuating people from the central area since they would have been exposed to lethal radiation and would all die sooner or later even if they survived the blast. In most cities as now built disruption at the centre involves lengthy detours: King regretfully admits that it is not practicable to "revamp the nation's communication system," but he would like to see new buildings planned on the radiating-spoke system with peripheral circular connecting roads, as these would be ideal for atomic defence.

This then is the outline of an atomic-disaster plan, and King naively hopes that a thorough understanding of it will help in combating the "atomic neurosis" We have our doubts. The plan is hardly inadequate, yet it seems to involve the entire replanning and redistribution of hospital services, with all the waste of time and energy that travelling to and from a peripheral centre would involve. Great stores of equipment and material must be formed and sterilised—and all of materials of which we cannot get enough for our peace-time needs. The very water-supplies and communications system must be altered. Houses must be built to the windward of industrial plants or military targets. Thousands of blood-donors must be listed. (King seems to think it will be easy to locate them when the time comes, but experience in this country under attack showed how much organisation and effort was needed even for this one aspect of defence.) Then the population must be ready to abandon their friends in the central area, and must not go searching for relatives or worrying about their personal problems: if this were allowed, says King, there would be no-one left to conduct the rescue programme! Surely such a scheme places impossible burdens on a population in times of peace, most of whom are having a hard struggle to maintain a decent standard of life for ordinary activities. It is true that even this country might survive the damage caused by a small number of atomic bombs, and it is reasonable to consider what we should do if we found ourselves partially but not

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[1] *Nat. med. Bull., Wash.* March-April, 1948. Supplement on the Preparation and Measurement of Isotopes and Some of Their Medical Aspects.

[2] King, E. R. *Ibid*, p. 155.

Reviews of Books

Radon: its Technique and Use

W. A. JENNINGS, B.SC., A.INST.P., physicist to the Royal Northern Hospital and Prince of Wales's General Hospital joint radiotherapy centre, London; S. RUSS, C.B.E., D.SC., F.INST.P., formerly physicist to Middlesex Hospital. London: John Murray for the Middlesex Hospital Press. 1948. Pp. 222. 18*s*.

RADON for medical purposes in this country has mostly been prepared at the Medical Research Council's radon centre, and this book is based on experience gained there. It has three main sections: the first deals with the physical properties of radon and briefly surveys its applications; the second describes in some detail the preparation, loading, and measuring of radon sources, and also discusses the (seemingly inevitable) variation in the strength of sources; while the third is devoted to the applications of radon in radiotherapy, and has a chapter by Mr. T. Anthony Green on his techniques for the more accurate use of radon "seeds." The second section is probably the most valuable, containing much information which will be very useful to those who work with radon purification plants. The other sections would be improved by removal of some repetitions and possibly by more critical selection of treatment-planning methods already fully discussed in a number of recent books. The space saved could be used to include a comparison of the efficiency of the apparatus described and of other designs.

It is unfortunate that radon "seeds," made by pumping the gas directly into gold capillary tubing, are dismissed in a footnote as not admitting of the refinements developed by the authors. Actually, G. E. Eddy in Australia has developed the gold capillary method (which has many advantages over glass capillary) to a higher state of flexibility and accuracy than is found, probably, anywhere else in the world.

Die Bedeutung der Seelenkunde von Klages für Biologie und Medizin

Dr. med. E. FRAUCHIGER, professor of comparative neurology, University of Berne. Berne: Huber. 1947. Pp. 99.

ALTHOUGH Klages has been writing for nearly forty years, his philosophy is very little known in English-speaking countries, and his characterology is not applied in medicine or psychology, except by the few students of handwriting who have profited from studying his many contributions to this subject. Abstruse and pessimistic though his views are, they contain much that is relevant to the problems of psychiatry. Professor Frauchiger, an enthusiastic disciple of Klages and a teacher of comparative neurology and psychiatry in the University of Berne, shows in this book how the philosopher's conceptions illuminate personality, and especially the psychopathic personality. Klages will not accept the common assumption that several essential kinds of psychopathic personality and neurosis can be classified: he holds that there is one psychopathy, the outcome of conflict between will and instinct, which results in a reduced sense of reality and by its combination with many sorts of character gives rise to the familiar neurotic variants. Dr. Frauchiger touches on the relation of Klages's views to those of Monakow, his criticism of the typology of Jung, and his reasons for disputing the psychoanalytic theory. From this work no-one could grasp the full philosophy of Klages, but it will direct philosophically minded physicians to a writer who has struggled manfully to anatomise human character.

Anatomy of the Eye and Orbit

(3rd ed.) EUGENE WOLFF, M.B. Lond., F.R.C.S., ophthalmic surgeon, Royal Northern Hospital, London. London: H. K. Lewis. 1948. Pp. 440. 45*s*.

MR. WOLFF's continued interest in the microscopic anatomy of the eye has led to a further enlargement of this book, which now contains 130 more pages than the last edition. The standard of production is as good as before, and the whole has been made more attractive by the addition of several coloured plates—photomicrographs and anatomical paintings. The general arrangement remains the same, but new work has been included on a variety of subjects. Some is work done by Mr. Wolff himself—including studies of the distribution of the lacrimal fluid, the precorneal film, and the mucocutaneous junction of the lid margins. He also describes Fincham's investigations on the mechanism of accommodation, and those of Michaelson and Campbell on the retinal capillaries, and quotes extracts from Le Gros Clark's Doyne lecture on the central connexions of the visual apparatus.

This is a splendid book, of equal use to student and surgeon, and containing all that is proved of the macro- and micro-scopical anatomy of the eye. As pathologist and surgeon to the Moorfields, Westminster, and Central Eye Hospitals, the author has had great experience of his subject, and he more than upholds the prestige created by his earlier books.

Human Physiology (3rd ed. London: J. & A. Churchill. 1948. Pp. 592. 25*s*.).—In this edition of their convenient textbook, Prof. F. R. Winton and Mr. L. E. Bayliss, PH.D., have arranged that several sections should be written by colleagues expert in various fields—a policy begun in the second edition and now extended. The book as a whole has been revised, and trouble has been taken to treat the whole subject in a balanced way. The illustrations, always good, have been increased.

ABC of First-aid Treatment (British Red Cross Society. Foreword by Air Marshal Sir Harold Whittingham, F.R.C.P. London: B.R.C.S. 1948. Pp. 28. 1*s*.).—This is a great improvement on the older type of first-aid manual. The different emergencies are listed alphabetically opposite whole pages of the corresponding illustrations, so that the concise and essential instructions are automatically associated with the visual image. The booklet will be invaluable at every first-aid point.

Archives of Neurology and Psychiatry (Vol. 25, 1941. London County Council, 1947. Obtainable from Staples Press Ltd., 14, Great Smith Street, Victoria Street, London, S.W.1. 30*s*. 0*d*.).—This collection of reprints, edited by Prof. A. J. Lewis and Prof. S. Nevin, was ready in 1941 but its distribution was interrupted by the war. The papers come from the staffs of the L.C.C. Central Pathological Laboratory, the Maudsley Hospital, and the London County Hospitals for Nervous and Mental Diseases, and cover a wide range of subjects, many with current, and some with permanent, value. The volume also carries a list of war-time publications by the staffs of these hospitals and of the Central Pathological Laboratory, which serves to indicate the work they undertook during the years when the *Archives* were not appearing.

Some British Pioneers of Social Medicine (London: Oxford University Press. 1948. Pp. 118. 12*s*. 6*d*.).—Very suitably, the Heath Clark lectures given by Prof. Major Greenwood, F.R.S., in 1946, have appeared in book form at the centenary of Sir John Simon's appointment as the first medical officer of health to the City of London. They are less a history of the British sanitary movement than a tribute to those who took the largest part in it. Half the book is devoted to Chadwick, Farr, and Simon, of whom Professor Greenwood says: "few who pass their memorial plaques on the façade of the London School of Hygiene could say what any of these men did and of the few more would remember Chadwick than Farr or Simon." His own preference is for Farr, with whom he has the greatest sympathy; but he admits that, of the three, Chadwick had much the greatest influence on the sanitary conscience of the people. Chadwick had received no scientific training; indeed, he had no science of his own, and what he borrowed was not always culled from the best sources. He was no orator, and his writings are forgotten; but he was a man of action. Having little care for himself, he ordered people about, and made many enemies, who eventually prevailed and drove him from office. Simon was intellectually far ahead of Chadwick, but he was more careful of himself, though he too fell from power for reasons which are not quite clear. Both lived to an advanced age in retirement.

The book is written with Professor Greenwood's usual skill and will be read with special pleasure by those who know him and share his interest in the development of biometry.

ule, beginning at the junction of the connecting ule and the terminal part of the distal convo- ed tubule. At 17 hours the intraluminal hæmoglobin l increased and in cleared thick sections a few hrons were thus outlined in their entirety; at hours most of the nephrons were so delineated and glomerular spaces too contained hæmoglobin. ter (113 hours) tubule walls ruptured and hæmo- bin escaped to the interstitial spaces, except ally where it "plugged" the tortuous tubule; r still (161 and 185 hours) the intraluminal hæmo- bin had further diminished and some reaction had urred around the escaped material. At 329 hours ost all the proximal convoluted and other seg- nts of the tubule were lined by normal epithelium; ew atrophic tubules contained dense masses of mosiderin Some tubule dysfunction was a conse- ence of the high level of hæmoglobinæmia in these periments—about 1 g. per 100 ml., corresponding that seen in man after hæmolysis of about 400 ml. whole blood About 70 hours after the initial d 20 hours after the final) injection the urinary tput dropped to 15% of the previous value; and s oliguria seemed to be associated with slowing of flow through the lumen of the nephron, a conse- ence of the increased viscosity of the protein-rich id, as well as with the degree of athrocytosis

In rabbits, hæmoglobin "nephrosis" can be oduced consistently when the animals are deprived water and then given repeated injections of hæmo- obin Yorke and Nauss[3] originally pointed out at the preliminary feeding of rabbits on dry oats creased the severity of the hæmoglobin nephrosis sulting from subsequent intravenous injections of emoglobin, and Flink[4] showed that the intravenous jection of hæmoglobin into dogs not deprived of ater was followed by hæmodilution and he suggested at the hæmodilution aided the excretion of the emoglobin in the urine. Lalich[5] has confirmed rabbits) that when available fluid is first depleted depriving the animal of water, hæmoglobin tering the renal tubules results in the formation of gment casts. He also reported dilatation of some structed tubules and focal necrosis of other tubules rabbits which developed uræmia. Bywaters and tead,[6] by combining dehydration with acid diets in bbits, found that compression of the leg muscles d the injection of human myohæmoglobin produced yohæmoglobinuric nephrosis In crush syndrome yohæmoglobinuric nephrosis[7]) and mismatched ansfusion (hæmoglobinuric nephrosis) the main nal lesion is in the ascending limb of Henle's loop d in the distal convoluted tubule, which show varying grees of necrosis, desquamation, and later epithelial generation; and pigment casts are not uncom- only found in the collecting and distal convoluted ibules From studies in these two conditions and om experimental work Bywaters[7] concluded that pigment nephrosis there is a direct physiological esorption) block in the renal tubular epithelium, and e recent studies in renal athrocytosis support his view.

Nevertheless, the occasional paucity of pigment and pigment casts in crush-syndrome kidney[8] and in blackwater fever[9] suggested that some factor other than simple obstruction operates to cause failure of tubule function in these and allied conditions. Maegraith and Findlay[9] suggested that a redistribution of the intrarenal blood-flow, in which the cortex was mainly bypassed, was partly responsible for degenerative changes in the highly specialised tubule cells; earlier Rigdon[10] had emphasised the rôle of anoxia resulting from the anæmia of malarial infection, and "renal anoxia" as a functional concept was also advanced by Tomb[11] Following release of 4–5 hours of complete limb ischæmia in chloralosed cats Keele and Slome[12] recorded a sharp fall in renal blood-flow (to about 30% of its initial value)—more than could be accounted for by the fall in blood-pressure. Later Trueta and his co-workers[13] described their tourniquet experiments, designed to simulate crush syndrome in man, and reported arterial vasoconstriction, apparently extending proximally from iliac to renal arteries, which greatly reduced the renal cortical blood-flow, and, by diversion, augmented and accelerated the medullary blood-flow. This mechanism has been said to operate in human crush syndrome; but these tourniquet experiments were of the "acute" variety and none of the animals lived long enough to develop tubular lesions and the associated oliguria, anuria, and uræmia Bywaters[7] complains that reflex vasospasm is too freely used by various writers to account for crush syndrome anuria Too little regard is now paid to the long-recognised autonomous capacity of the kidney to maintain its blood-flow in face of variations in the general circulation and of changes in bodily posture.[14] Severe tubule dysfunction and oliguria with attendant electrolyte upset and uræmia occur in some cases of abortion, with moderate to severe blood-loss and vomiting,[15] in which, as after hæmatemesis and melæna,[16] there is a great reduction in glomerular filtration and in renal blood-flow.

Similar disorders of tubule function occur in a variety of other conditions, including incompatible blood-transfusion and blackwater fever, as well as in crush syndrome In reviewing the common factors causing renal failure in these conditions Foy et al.[17] emphasise dehydration, with diminution of blood-volume, renal blood-flow, and glomerular filtration, rather than tubule blockage as the cause of the anuria. Dehydration is also a common factor in other conditions in which tubular lesions and acute renal failure are described—excessive vomiting in pyloric stenosis, cholera, Weil's disease, yellow fever, and concealed accidental hæmorrhage General depression of renal blood-flow (with autonomous renal adjustment) will affect most those distal tubules

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fatally injured. But that is a very different matter from the proposal that we (and presumably the people of all other countries) should henceforward make defence (active or passive) the chief end and aim of our existence.

Tuberculosis in Scotland

THE effect of the late war on the death-rate from tuberculosis is well known. An increase was one of the expected evils, and it came with explosive suddenness. Nevertheless for some unexplained reason the peak reached in 1941 was followed by a fall, which in England was continuous, and by the end of 1945 the English death-rate was the lowest on record. In Scotland the fall was slower, but it too was progressive, and the tuberculosis deaths during 1945 (3803) were 9% fewer than those of 1941 (4175) though they were still more than 10% above those of 1938 (3431). The fact that the disease is one which usually lasts for years makes it unwise, however, to base any forecast solely on recent mortality figures; and despite the fall in the number of deaths there have been other and perturbing trends.

The rise in the incidence of tuberculous meningitis which was seen both in England and Scotland during the early years of the war could only be interpreted as evidence that infection was being diffused among a young population which had hitherto partly escaped. It was greatest in Scotland, and in its peak year—again 1941—it reached a figure 48% above that of 1938. Moreover, while deaths fell, notifications in Scotland rose by 1943 to an annual total of 10,088, the highest since 1929, and the respiratory portion of the total was the highest since 1926. Notifications fell during 1944, remained stationary in 1945, and again rose during 1946 and 1947, when they totalled 9973. Admittedly there are fallacies in notifications, but it is hard to account for the great increase. Those who watched the rising figures awaited with misgiving the harvest they portended, and the first evidence of that came in 1946, when the death-rate, after its steady slow fall, rose suddenly to that of 1942. Last year it was almost back to the peak figure of 1941; and Mr. WALTER ELLIOT, speaking on the Scottish health estimates in the Scottish Grand Committee of the House of Commons on July 1, did well to draw attention to a situation which is, as he says, disquieting.

It is difficult to see the facts in perspective. Conditions of life probably differ little in England and Scotland, taken as a whole; but in both countries they differ greatly from district to district. There is little doubt that tuberculous infection has become more widespread in the industrial areas of Scotland: and if we remember that some 40% of the Scottish population is congregated in the industrial belt of the West, where conditions of life and housing leave much to be desired, we may find a partial explanation of the big increase of notifications and the rising death-rate. This increase will certainly dispel any complacency based on the falling mortality figures of the past six years, and it should also dispel any hopes of conditions righting themselves. In Scotland the number of infectious patients in the community has increased at a time when it grows harder and harder to give institutional treatment to those who ought to have it. Treatment in the home is therefore more and more required; but so long as houses are overcrowded it will remain impossible to secure the isolation needed if such treatment is to be safe. In considering the present situation we cannot ignore, either, the possibility that the disease may be favoured by some of the present restrictions of diet. Tuberculosis has always been a problem of the adolescent and it is taking a disproportionately heavier toll of the young. Among Scottish women in 1947 the death-rate from tuberculosis of the lungs was 63 per 100,000; but in the age-groups 15–25 and 25–35, the ages of adolescence and full fertility, the rates were 142 and 147. Quite possibly the food nowadays consumed by young adults does not fully meet their needs for protein or perhaps for fat; and we are still faced with the vicious circle of increased infection, overcrowding, and poor nutrition. At the back of it all are the economic effects of war, which dominate the national life and the life of the individual

Renal Tubule Dysfunction

MOST students of pathology know that at necropsy the kidney gives a positive prussian-blue reaction in pernicious anæmia, acholuric jaundice, and other hæmolytic anæmias; that this is due to hæmosiderin present in the tubule cells; and that hæmosiderin is the iron-containing moiety remaining in the cells after katabolism of hæmoglobin removed from the glomerular filtrate at times of hæmoglobinæmia. Most too are familiar with the fatty appearances of the kidney and fatty casts in the urine in various forms of nephritis and "nephrosis," and they will also recall the hyaline droplets formed in the renal epithelium which are likewise associated with increased glomerular permeability the result of glomerular damage. These conditions are manifestations of renal athrocytosis, described by PAUL GÉRARD[1] as the characteristic property of the vertebrate nephron—the resorption of electronegative colloids through the apical surfaces of its cells, which become increasingly permeable from the proximal to the distal end of the striated border segment of the nephron.

In health the human glomerular capillary membrane is impermeable to molecules of the size of the plasma proteins, and albuminuria is usually taken as evidence of glomerular damage, save perhaps occasionally where it follows exertion. The hæmoglobin molecule (molecular weight 68,000) is about the largest to pass through the normal glomerular filter, and RATHER[2] has used hæmoglobin as a "marker" substance in the study of renal athrocytosis. He gave rats intraperitoneal injections of purified human hæmoglobin 1 g. twice daily for five injections, and found that 2 hours after the first injection (when the hæmoglobin had been absorbed into the blood-stream and reached the glomerulus) there were particles of stainable hæmoglobin in the epithelial cells of the proximal convoluted tubules, and at 17 hours the cells were packed; demonstrable hæmosiderin was maximal at 65 hours. While the tubule cells were becoming sated with hæmoglobin, a more concentrated form of hæmoglobin appeared and accumulated within the rk—than the more placid long-distance man. The lue of glucose and alcohol is chiefly psychological. cohol in moderate amounts with meals may help to rd off staleness. Though the first to suggest that ucose should be taken immediately before races, he w believes that its effect is due principally to the easant sweet taste.

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[18] Badenoch, A. W., Darmady, E. M. *J. Path. Bact.* 1947, 59, 79.

[19] Pathological Society of Great Britain and Ireland, January, 1948.

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ANSWERING A CALL

he service is now centred in the Ayrshire Central pital at Irvine. The team of two nowadays travels n 8 h.p. Morris or Ford car. This is an interesting sure of our present modest standards: Dr. Morris l a 21 h.p. Hillman, an easily recognisable car, which ld be stopped by a policeman with a message if a came through when he was out on less urgent duties. his account of the service he mentioned the need combining speed and caution in getting to cases. was also hoping to see the team of two expanded four—perhaps five. He would have liked to add a ior nurse, a chauffeur, and a universal donor—ugh he agreed that the chauffeur might combine last quality with the ability to drive a car. Modern nsfusion technique has made the donor unnecessary. l with a smaller car the chauffeur has been squeezed . The need for speed remains, however, and Dr. Soldenhoff urges doctors to send early when a patient leeding. He would like to see a conference over every ternal death, whether it happens in or out of hospital, which all interested should be present. This, he lieves, would help to prevent future tragedies.

Disabilities

9. INFANTILE PARALYSIS

I CONTRACTED infantile paralysis while serving with the rchant Navy in the Far East in 1939. In 1942 I was charged from hospital with complete paralysis of the leg, partial paralysis of the right leg, abdomen, and k, and diplopia in the left eye. I now wear a full-gth calliper with a corset-type spinal jacket and use o sticks to walk.

Disability is mainly in the eye of the beholder. The lexion I see when passing a shop window—the lurching t, the two sticks, the black eye-shield—is almost believable. In a mirror the sticks appear to be being ced on to the ground: it looks tremendously hard rk. But in fact it is not. To me, walking on the el is almost effortless, and I feel I am using my sticks y as many people swing their rolled umbrellas.

This misconception has a moral. Sometimes I have n disappointed that strangers do not share my husiasm for recovery. The mirror has told me why.

o the fit it is something of a paradox that disability, war, can bring new and unexpected opportunities self-development. We see different images of the e object. So it is not surprising that, on first acquain-ce, there is a gap between a disabled person's view is own disability and other people's view of it. The cessful disabled person is the one who narrows that gap eveloping unsuspected abilities.

here are two alternative pitfalls which await the nanently disabled. First, there is the obvious danger assively accepting disablement and so changing one's downwards, narrowing one's interests and perhaps pting lower employment to suit one's new condition. ndly, there is the not so obvious danger of refusing dmit one's disability. Dr. Hannan[1] referred to this as er compensation." If a disability is permanent e is nothing to be gained by denying facts, and indeed ong as one deludes oneself that the disability is only porary one is building on sand and will get no nearer ecoming a successful disabled person. As I see it, conquest of disability is the widening of one's rests and the raising of one's standard of life, despite physical handicap.

EARLY RECOVERY

ny success I have had in overcoming my disability be traced back to the fact that throughout my years in hospital I was never allowed to become tally sluggish. During the first 6 months, when I was either being moved from one Asiatic hospital to another or being shipped home, there was a continual change of surroundings which did much to prevent boredom. Once back in England and safely billeted in an E.M.S. ward there were fewer distractions. But there were compensations, not the least effective of which was meeting cases worse than myself. Any nodules of self-pity were soon dispersed by being opposite two cases of ankylosing spondylitis, lying on their beds as stiff as pokers from neck to heels. To see them happy, contented, and even occupied must have been a great boost to anyone's morale. It was impossible not to feel that if life held something for them it probably held a good deal for me.

I benefited too from the change from a private room to an open ward. Single rooms are pleasant enough, and I found the solitude and opportunity for meditation enjoyable. Nevertheless, by oneself one is inclined to lose touch with reality and even get fussy. An orthopædic ward full of long-term patients from Bermondsey and the Borough presents very different conditions. If my existence was more austere it was certainly more healthy psychologically. At all events I was living among real people, most of whom would, for economic reasons, regard a life of idleness—albeit enforced idleness—with abhorrence. I cannot emphasise too much the importance of living in a community whose members tacitly assume that they will return to some form of remunerative employment. It was, I think, because of this outlook that we were such a remarkably contented lot, and this in itself helped all of us along the road to recovery.

In addition to the normal therapies we were influenced for the better by two external considerations—the weather and the design of our hut. The hut was in an open field, with three or four double doors on each side, so it was comparatively easy to move the beds out on the grass on sunny days; and fortunately those two summers were particularly sunny. We thus benefited from the sunlight and fresh air as well as from the change of scene, which since the beds were not always placed in the same position was doubly varied. Altogether life was anything but stagnant, and it wasn't surprising that in a few months I began to develop the first compensation to disability—a satisfied outlook.

The next step in my mental rehabilitation came about quite by chance. One evening the ward sister asked me to lend her a ruler so that she could rule up the Report Book. Having nothing particular to do, I offered to do it for her. For the next year that, and later the weekly store sheets and nurses off-duty list, became my regular Saturday night work. It was astonishing how hard it was at first. The laboured care with which I measured the width of each column was almost laughable; I suppose a year in bed had dulled my powers of concentration. But it was a tonic and I think it provided something which occupational therapy, then in its infancy, lacks even today—a feeling of responsibility. However simple the job may seem now, it did not seem so elementary then, and I felt I was being relied upon to get it done. Come Saturday night, and whether I wanted to or not I had to get down to it. This compulsory disciplining of my mind produced the second necessity to fight disability—a constructive outlook.

No paragraph on recovery would be complete without reference to the Infantile Paralysis Fellowship, whose activities have persuaded many a disabled person that he will get a place in the sun.

INSTRUMENTS

I am, of course, completely dependent, for walking, on surgical appliances. The full-length calliper and spinal jacket are as necessary to me as trousers are in Oxford Street.

It may come as a surprise to many people that, after experiment, I have abandoned the bending calliper and

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[1] Hannan, J. H. *Lancet*, 1948, i, 655.

Special Articles

AN OBSTETRIC EMERGENCY SERVICE

The Ayrshire Emergency Domiciliary Service, with more than ten years' experience to its credit, is an example worth studying. It was founded in 1937 by Dr. W. I. C. Morris, then consultant obstetrician to the Ayrshire County Council, and operated from the Seafield Hospital. In a report[1] on the work of the service published in 1939, Dr. Morris noted that some 47% of the cases treated were operative emergencies, while 45% were cases of hæmorrhage. Nowadays cases needing operative help are fewer—presumably because they reach hospital earlier—while the treatment of cases of hæmorrhage has expanded greatly with improvements in the blood-transfusion services. The cases mainly treated today are postpartum hæmorrhage, retained placenta, and incomplete abortion.

EQUIPMENT

The original equipment consisted of an instrument bag, a canvas and leather holdall, two canvas containers for sterile drums, a flask of dextrose in normal saline, and a sphygmomanometer. The holdall contained various packets, in which were materials for dealing with different emergencies—preparation of vulva, forceps delivery, tears, craniotomy, and abortion.

Dr. R. de Soldenhoff, Dr. Morris's successor, has lately given a description of the service today, and of the equipment used.[2] He pays tribute to Dr. Morris's ingenuity in devising the original equipment: the only changes made have been those arising from the change in the character of cases dealt with. The modern equipment is as follows:

1. A bag containing drugs, anæsthetics, a hand centrifuge, antiseptics, syringes, and a head-light.
2. A sphygmomanometer.
3. A tripod stand with a T-bar to carry blood-transfusion bottles.
4. A box containing recipient and donor sets supplied by the West of Scotland Blood Transfusion Service.
5. A box containing blood, plasma, and bottles with citrate for donors.
6. Five small drums for high-pressure sterilising, containing: a cutting-down set for giving blood; spare dressings and uterine packs; gloves; caps, masks, and small towels; lithotomy sheet and towel clips.
7. A canvas bag with straps containing a preparation-of-vulva packet, rubber mackintosh, and rubber apron; a drip-saline packet, and a litre bottle of 10% glucose saline.
8. A canvas bag with straps containing one packet with material for suture of perineum or repair of cervix, and another packet with material for clearing out incomplete abortions.

THE SERVICE IN ACTION

Any obstetric emergency associated with hæmorrhage can be dealt with using this equipment. On receiving a call, Dr. de Soldenhoff or his assistant, and a house-surgeon, collect the equipment (which has already been sterilised) from the front hall of the hospital, pack it into the back of a car and go to the case. The interval between receiving a call and setting out is never more than ten minutes. No case of the emergency type is brought into hospital until the condition is sufficiently improved for the patient to stand the journey by ambulance. A blood-pressure below 90 mm. Hg systolic is looked upon as a bar to travel: when a case is to be moved the blood-pressure should be within the region of 100. The patients are mostly victims of severe hæmorrhage and have undergone the strain of delivery or obstetric interference; they do stand travelling well.

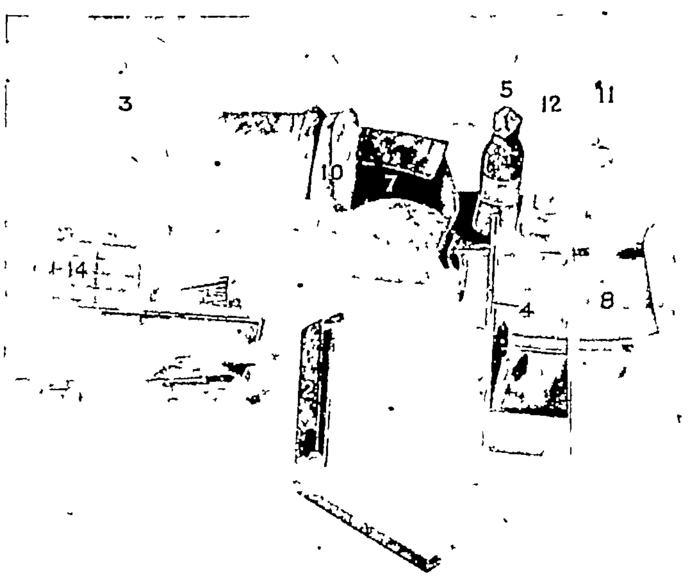
TRANSFUSION

All incomplete abortions of the emergency type dealt with in the home, as are retained placentæ postpartum hæmorrhage, great care being taken to av over-transfusing. Whenever possible, blood is plasma being given only at the start of treatment until blood is ready.

The patients are cross-matched and tested aga high-titre Rh-factor serum. This helps to eliminate number of Rh-negative cases, and—though not co pletely accurate—it picks out the majority of Rh-posit mothers and so is of use in emergency work. After t case has been dealt with a firm effort is made to tak pint of blood or more from the relatives, to replace blo given. This is sent the next day to the West of Scotla Blood Transfusion Service. Last year a total of 52 of blood and 38 pints of plasma were used in the em gency service. If, after the volume of blood lost has be partially replaced, the blood-pressure is still very l —say 70/40 mm. Hg—'Methedrine' is sometimes give 15 mg. intravenously and a further 15 mg. intramu cularly. The results have been impressive, in som cases, in restoring the blood-pressure, but methedri has not yet been used in enough cases to justify an statement as to its ultimate worth.

The danger of over-transfusion is always being stresse the team fully realise that, on occasion, patients ha been killed by too energetic replacement therapy an the giving of intravenous fluids too quickly. Once th patient's general appearance improves and the pulse i steady (even though the blood-pressure may not have reached 100 mm. Hg) she is given morphine and left to recover, since her blood-pressure will eventually reach normal.

Morphine, however, may also be given ove enthusiastically. Only enough should be given (D de Soldenhoff thinks) to dull pain and ease restless Larger doses depress the respiratory system, and the patients need all the oxygenation they can get. cases complicated by severe pain intravenous morp is beneficial, and has helped shocked patients dra tically. Where an anæsthetic is required, intraven thiopentone is used in minimal doses: more th 0·4 gramme is rarely needed and it is given very sl The patient is always brought to the best pos condition for any operative procedure, but time is n wasted where there is bleeding with a retained placen The team's first task is to control the hæmorrh



The emergency equipment: 1. Bag with drugs and syringes. 2. Sphygmomanomete Tripod stand. 4. Donor set. 5. Bottle with citrate. 6. Containers for drums. 7 with equipment for preparation of vulva. 8. Bag of instruments. 9. Centrifug Arm splint. 11. Blood, Rh+ O₄ 12. Plasma. 13. Wooden box for blood sets. (1/10 natural size.)

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[1] *Trans. Edinb. obstet. Soc* 1939, p. 77.

[2] Paper read before the Edinburgh Obstetrical Society on March 10.

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RECREATION

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In England Now

A Running Commentary by Peripatetic Correspondents

THIS is the conference and convention season. Every Wednesday and Thursday you will find Euston and King's Cross crowded with ophthalmologists, pathologists, and what have you, each with a small bag (toothbrush, pyjamas, and a Penguin) and an air of pseudo-vacation. The surgeons, I am told, go by road. We enjoy going: we see many friends; we dine with moderate conviviality: and we hear some new ideas. (One learned man assured me that he went only to see in the flesh those whom he knew in print, so that he might assess their credibility—ipsa verba, "to make sure that they are liars.")

Let me tell those who have enjoyed the dinner (7s. 6d. including gratuity) at the scientific meeting of the Society of Experimental Omphaloscopists that in the matter and manner of a beano they have a lot to learn from the meetings of those concerned with the public health. These choose for their venue not some weary university town but a Resort with hotels de luxe and a mayor who gives a handsome if rather incoherent reception to the convention. Social events follow one another in lightning succession, and you will have the opportunity of enjoying a tour of a chocolate factory, a concert of light classical music in the Winter Garden, and a visit to Lover's Leap (admission 6d.) and the ruins of several medieval strongholds. It is true that some gentlemen make pronouncements connected with public health during the morning hours, but it is hard to finish breakfast by 9.30 A.M. when one has been dancing the evening before. We ought to know our fellow hygienists in other parts of the country, and what better opportunity could there be than the cocktail party given by the Aquaville Chamber of Trade? After all, our expenses are met by the ratepayers. (My own M.O.H. tells me that the care of his sweet-peas allows him no time for such gallivantings.)

* * *

In my student days, I should say less than one in seven budding doctors thought of specialising. But the other day I asked some final-year students about their choice of a career and 70% favoured specialism. *Spens agitat molem?*

* * *

There are troubles in the deep country which we as Londoners or near-Londoners once looked on as practically mythical. A hornets' nest is one of them. True, I have been stung by a hornet, but that was in the far South and I was competing with it for a bunch of grapes in the orchard. I can remember my noisy grief but not the application of any remedy, for I was but six, and I have a suspicion that it would be in accord with our easy-going Colonial ways to rely on the vis medicatrix naturæ. However, it appears that the hornet is a native inhabitant of England. Lately one has been prospecting in our garage, the vicar had one in his bathroom, we had another in our lavatory, and yet another flew with a purposeful air over our ripening raspberries. The question immediately arose from my alarmed household—how were hornet stings to be treated?

The popular belief is that three stings will kill a man, and five (or seven) a horse; but information on how to deal with a toxin so powerful as that of the hornet is alleged to be is entirely missing from my books. Thirty years ago a correspondent in the *Times*[1] first advocated using dilute acids (e.g., vinegar) for wasp-stings and dilute alkalis (e.g., ammonia) for bee-stings. *Martindale* gives a comprehensive list of remedies, including onion, but does not fit the remedy to the type of insect biting or stinging. Apparently both bee and wasp venoms are proteins, and the main troubles arise from allergic reactions or even anaphylactic shock if the sting gets into a vein.[2] *Webster's Dictionary* defines a hornet as a large wasp, so that local application of vinegar seems reasonable; but as the creature is said to be pugnacious, determined avoidance of its society seems highly desirable.

The vicar's treatment of his hornet seems to have been peculiarly British. He gave it several whiffs of 'Flit,' then felt sorry for it and let it out of the window.

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1. Speyer, E. R. *Times*, Aug. 20, 1919; see Brown, O. H. *Lancet* 1941, ii, 440.
2. Annotation, *Lancet*, 1941, ii, 319.

returned to the straight one. The reason, in a word, is "mobility." In office life it is important to be able to stand up and move about without having first to push a calliper into its locking position. "Only a matter of a few seconds," you may say. Maybe, but one does not want to be a second behind other people, and when one is also wearing a spinal jacket straightening a calliper may well take two or three seconds. Similarly in a crowded bus or train, with several people standing there is not always room to straighten a calliper without asking them to move.

Originally I had the Thomas-splint type with a complete ring at the top. This ring, in conjunction with my paralysed hip, knee, and ankle made it difficult —especially with trousers—to put the calliper on by myself. My present calliper has a half ring and strap, and is much easier to put on and off.

Regarding footwear, at first I bought the ordinary mass-produced medium-priced shoes which most people wear, and I must admit they seemed to meet my needs. But two years ago, as an experiment, I went to a firm of shoe manufacturers and had a pair made. They were a great success. More than anything else they seemed to enable me to balance better. With them, walking for a few yards with one stick, and taking a single step stickless, is not only possible but fairly easy.

Fortunately I could dispense with a wheel-chair soon after arriving home—but not before I had discovered that wheel-chairs which seem admirable in hospital are often not so suitable for the outer world. Their main defect is usually unwieldiness. The large comfortable folding chair is often difficult for a woman to heave on and off the back of a car. A friend of mine recently purchased from Resilco Ltd., of Hammersmith, a new type of light-weight chair which folds about a vertical rather than a horizontal axis. The ordinary flat seat can be lifted out and this allows the chair to fold up into a straight line, as it were, with the four wheels also in a straight line and still on the ground. It is quite easy for people of no great strength to move this chair about and lift it when necessary on to the back of a car.

RE-EMPLOYMENT

For the permanently disabled, work, not time, is the great healer; but it must be productive work, in which the disabled person is interested and which—more important still—he does not feel to be below his ability. Employment for employment's sake may come very near to self-imposed slavery. If work ceases to be a vocation and becomes a mere task it loses much of its value as a mental stimulus. When I started work again as a £3-a-week clerk it was not a pleasant experience. Any joy I might have felt at being back in employment was more than cancelled out by the apparent narrowness of the future and the not infrequent comments of one's acquaintances that one was "lucky to get a job at all." The day-dreams of hospital were, it seemed, to remain just day-dreams.

But even though the work was depressing, it was, when seen in the right perspective, as necessary as any treatment I had received. Though I did not realise it at the time, the important thing was that I had a foothold on the ladder of employment. Fortunately for me there was a war on, so the labour market acted in my favour. Soon I changed my job and later changed again and then again, and each change brought me an improved position. Several of my friends, so far from hailing each move as a step forward, regarded them as a foolish and unwarranted jettisoning of security. But on looking back I can see that, whatever the opinions of others, each change upwards strengthened my confidence, and this in turn was the best service I could do myself.

When later I purchased a car this enabled me to widen my activities. By the time the V1's arrived I was touring A.A. gun sites in south-east Essex as a lecturer for the Army Education Service. For the time I felt really independent. On the gun sites no- appeared to be at all astonished that I walked on st or that I sometimes needed assistance up steps I in fact, being cured of any disability complex I have possessed, not so much by my own efforts as b the attitude of others.

The unusual and not always consistent form employment I have chosen have justified themselves b results. The Army lecturing led indirectly to broadcast talks, and later to the writing of scripts; my chang in office life have at last resulted in my reaching th administrative level. I am still only 28 and it does n necessarily follow that I shall always be as succes nevertheless, I think there is enough evidence to convin other disabled people, and also those concerned their welfare, that security of employment is not ever thing. Taken too far it may lead to a rut of pleas appearance but deadening prospect. However, the important thing is to get a disabled person into a job and then encourage his ambitions.

TRAVEL

A person's success in overcoming his disability will, in the long run, depend on his ability to get about Whether he does it by wheel-chair, spinal carriage, private car, or public bus does not matter. But whether it is for employment or enjoyment, travel he must, and the nearer he can get to normal modes of transport the less unusual he will be considered by other people.

Unfortunately the design of buses is not always helpful. I rarely sit down in an M. & D. bus without scraping the shins of my callipered leg on the seat in front; and in most motor coaches it's impossible to stick a straight leg under the seat in front—one puts it in the gangway and hopes for an ob conductor and a rigid enforcement of the no-standing In contrast, all the modern types of London Tran Executive buses allow sufficient clearance for a stiff le pass under the seat in front. In a less bothering w the same applies to railway carriages, where the se opposite are sometimes too deep to allow a stiff leg pass underneath. A great help for boarding tr are the two vertical rails *inside* the door, as fitted some of the new Southern Region coaches.

On an average I travel on ten trains and twenty b each week. The only difficult part is getting on a off, and practice has made this much easier. The dr is to hold both sticks in your right hand, grasping the around the neck with the thumb and forefinger, so th your left hand is completely free and your right han almost so. One hand rail can then be grasped in eac hand and the right (fairly good) leg can be got on th platform and the other leg swung up. The right l acts as fulcrum with the arms and body as a lev This method saves any upward strain or pull, and b using the window-ledge of the open carriage door ins of the second hand-rail, can be applied to trains.

Experience has taught me that for coming do is a mistake to imitate the sideways method of able-bodied. The forwards position is safer, for wi sticks between your right thumb and forefinger, hands can be used for sliding down the rails, the adv of this being that if the vehicle unexpectedly pic speed one can, by gripping hard and pushing scramble back on the platform again.

Crossing roads, which may take anything from 1 30 seconds, is not a hazardous business. With little ch of success, there is no temptation to try a risky in the face of oncoming traffic. But once one has st across one should keep going—even in the face of app danger. No-one will wilfully run you over, and to will only confuse the drivers. Make your intenti clear by continuing your way and it is unlikely you will come to any harm.

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1. Speyer, E. R. *Times*, Aug. 20, 1919; see Brown, O. H, *Lancet* 1941, ii, 440.
2. Annotation, *Lancet*, 1941, ii, 319.

The latest development is that the rural district council's rat-catcher has called, a large, fresh-faced man who shook his head when I asked whether the council would deal with a hornets' nest, when and if found. As a private citizen, though, he had dealt with one of his own, and he described with gusto how he did it. He arranged a box to stand a few inches below the nest—as large as the bucket my daily help, an interested listener, was holding. On the box he placed a rag soaked with "the stuff"—i.e., cyanide. Next day every hornet was dead. Feeling sure that I should be dead too if I attempted these manœuvres, I said that my husband was in poor health and could not be asked to do such things, and it did not seem quite the job for me. He suggested kindly that I could fix the rag on the end of a long stick, soak it in "the stuff," and hold it to the entrance of the nest until they were all killed. This seemed even more hazardous. It was an impasse and the rat-catcher was regretful. "Fleas?" he asked hopefully. I repudiated fleas. "Bugs? Blackbeetles?" He was lyrical over the number of blackbeetles he had lately killed. But I was firm that my only pests were hornets, and he left.

I forgot to mention the adder which lives in the corner of the garden near the garage, and which I strongly suspect of having bitten the cat. My rat-catching friend would probably have advised me to catch it by the neck and nip off its head with a quick flick of my teeth.

* * *

The differential diagnosis of "numismatist's thumb" (described in this column on July 17, p. 118) is obviously from "miller's thumb," a well-known occupational trauma familiar to Chaucer:

> "The Miller was a stout carl for the nones . . .
> Wel coude he stelen corn and tollen thryes:
> And yet he hadde a thombe of gold, pardee."

The allusion is to the acquisition by the miller of a smooth, broad, and rounded terminal phalanx to his pollex through the constant habit of applying it to the meal-spout to test the meal by rubbing it between fingers and thumb. By seeing that his meal was properly ground the miller was likely to make more profit—hence a "golden" thumb.

* * *

Writing a book is difficult enough but procuring the photographs with which to illustrate it presents frustrations and disappointments which are hard to bear. The infinite trouble and the large element of chance required to gather the patient, the photographer, and the lesions to be recorded together at any one time almost make one regret the old days when a drawing had to suffice, for this could be attempted unaided and the indifferent results handed at one's leisure to a proper artist for improvement.

Tonight a colleague excitedly brought me a specimen glass with its contents still warm to demonstrate a large object like a herring-roe vertically suspended in a hazy urine. It is many years since I last saw a complete vesicular cast, so putting the precious object in a place of safety, dropping my pen, and even leaving my pipe behind, I rushed off to find the photographer. Being at that twilight time when those engaged in more respectable occupations are buying their evening papers and making for home, I realised that this might be a difficult task. However, after many false hopes he was run to earth in the animal house, and all was tied up and arrangements completed for the picture to be made within the hour.

I spent a few minutes in admiring some golden hamsters of which the photographer was particularly proud—entertaining little fellows with large cheek pouches in which their recent meal could easily be palpated. Then, returning to the clinic, I was horrified to find that the precious cast could not even be classified as a thread but had melted away to leave just one more "urine: hazy in the first glass."

* * *

The recent headline, "A Meeting of Child Psychiatrists," conjures up in my mind a picture of a group of infant prodigies, their bulging brows wrinkled as they dogmatise over Freud. And talking about misleading titles, as a student my college boasted a Small Bore Club—I hate to think what its members have become by now.

Letters to the Editor

CARS FOR DOCTORS

SIR,—In his letter last week Dr. Boucher raises question of doctors having absolute priority for delivery. The reasons why this has not been are as follows:

1. If the whole medical profession had new cars, would absorb very nearly the whole of the home quota new cars for one year.

2. Human nature being what it is, and the secon prices of one-year-old cars being what they are, the t tion would be for every doctor to claim absolute and renew his car every year. This would mean that would be practically no cars for other essential users.

With regard to cases of genuine need, where doctor really has not got a serviceable car, then retail trade is doing its best to advance delivery to really early date. In such cases a high degree preference is given. A difference of opinion often as to what is a serviceable car. In some instances wh I have come across, the dealer claims with justice t the car regarded by the doctor as unserviceable with a little attention, easily run perhaps tens of thou more miles. We leave these cases to be settled betw the local dealer and the doctor concerned.

R. GRESHAM COOKE
Director, Society of Motor
Manufacturers and Traders Ltd.

148, Piccadilly, London,
W.1.

BEDS FOR TUBERCULOSIS

SIR,—In his article of May 8, Dr. Bentley, insp by visits to Swiss sanatoria, advocates the adoption a less rigid régime of bed rest in British institut He hopes in this way to alleviate the gloomy outlook f thousands of patients waiting in vain for admission sanatoria, where wards have been closed because of shortage of nurses.

Having been trained in very strict principles of rest and ample and efficient nursing while work a municipal institution in England during the la I had to face quite a different situation when I to my native country and took up work in a m institution here.

For 300 patients there were 28 nurses (most of them fully trained), including theatre staff and others not w in the wards. There was no matron, no assistant mat no senior sister, and no night superintendent or night si and I found the régime very lax. I admit to a long fi despondency over this appalling state of affairs. I de that I should have either to lower my own standards considerably, or to try to make the best of existing condi I decided on the latter course, and after a few months' str (aided by 3 or 4, mostly very junior, medical officers managed to introduce and maintain a régime which inc a fair amount of *collapse therapy* and major thoracic sur falling not very far short of that practised in most sa institutions in Britain. Needless to say, the disease in r of our patients was far advanced; and these had to be on very strict bed rest. The standard of nursing wa course, far from ideal.

After two years in this environment I found m placed in charge of a sanatorium in the country 14 nurses (only 2 fully trained) for 310 patients.

The patients were very much of the same type as t the hospital, but the proportion of really advanced ca somewhat lower. Again there was no matron o sister, and no night supervising staff (the night staff c of 5 nurses). The total of 14 nurses includes 4 serving operating-theatres, &c. Fortunately, there was an enth team of 3 experienced doctors, later increased to 5, inc 2 with excellent war-time experience in Britain.

While not claiming to have a model establishment succeeded in introducing a fairly strict régime of bed rest and exercise, including modest attempts at reha tion by graded work. The nursing staff are not overw in fact about a quarter of them are ex-patients. Again standard of nursing is not ideal, for there is precious blanket-bathing, treatment of pressure-points, or items of good classical *nursing*; but the bedridden pat are fairly well looked after, and the nursing in the th ty unit (12 beds) is good, although done by only 1 sister 1 other to help in the mornings.

out a quarter to a third of the patients are on a ified régime of more or less strict bed rest (stages 1–3); emainder (stages 4–6) are on bed rest for 6, 4½, and ours, respectively, in the daytime. There is one mediate stage—3A—which incorporates patients are on bed rest all day but are allowed to go to lavatory, wash in the bathroom, and take their ls in the common dining-room. Stage 1 is "absolute ," but with the existing staff we can afford to enforce in only a few special cases. All patients from e 4 upwards make their own beds, except for turning mattresses, and are on graded exercise. Some ents in stages 5 and 6 help to serve meals to their idden fellow patients, since domestic staff is also short; others help with the work in the vegetable len, workshops, offices, and laboratory. Quite a members of the administrative and maintenance are ex-patients.

ter induction of artificial pneumothorax patients are kept trict bed rest for 3 days, and then on modified bed rest ges 3 and 4) for a variable time; we are trying to keep all patients under institutional control for as long as feasible. r thoracoplasty patients are kept on almost absolute rest for about 5 days; then they are allowed to get up ne lavatory but continue to wash and feed in bed for 2–3 ks; after that they are kept on modified bed rest (stages 3 3A) for about 2–3 months, and on stage 4 for at least her 3 months, when they are put on graded exercise; im to keep them in the sanatorium for about one year operation. They are doing well on this routine, and have had remarkably few postoperative complications. usual operation is extrafascial thoracoplasty with apico- ; and, although we can afford very little in the way of siotherapy, the cosmetic and functional results are sfactory.

Ve have become much more liberal than formerly he number of patients who, while otherwise on bed , are allowed to get up to the lavatory and the bath- m. They are none the worse for this; and, as usually pens, morale has risen when the use of these amenities been permitted. Temperatures are taken and rded by the patients themselves, except for those of ients on very strict bed rest; while admitting this ot an ideal practice, we find that it is a workable promise.

certainly do not advocate the abolition of such l-tried lines of treatment as are practised in most ish institutions; nor would I suggest the almost bulatory treatment which is adopted at some places the Continent; but, with Dr. Bentley, I venture to gest that to meet the present difficult situation it ht be worth considering some relaxation of the very ct sanatorium routine, while maintaining the essential ures of bed rest, even if somewhat modified. I self look forward to the time when I shall work with "few" nurses as my more fortunate British colleagues e at present.

natorium U.S.N.P., Prosečnice nad Sázavou, Czechoslovakia.

A. EISER
Medical Director.

POSTCRICOID PHARYNGO-ŒSOPHAGEAL PERFORATION

IR,—Mr. Goligher is to be congratulated on his uable article in your issue of June 26, and on the py result in his 2nd case which was treated by nediate suture.

he second type of injury, which is probably less ommon, deserves emphasis because the pathological esses which are set up will often kill the patient as surely unless active measures are taken. This e of injury is illustrated by the following case.

man, aged 58, was admitted to Hammersmith Hospital Iay, 1941, with a long history of peptic ulceration. In course of investigation, gastroscopy was carried out by xpert, with local anæsthesia. The examination was made out difficulty and the patient made no complaint at time, although subsequently he said that his throat never been quite comfortable after the examination, swallowing was painful.

On the 4th day after the gastroscopy I saw the patient who was then complaining of tenderness in the lower part of the neck and a sore throat. On examination there was fulness at the lower part of the neck, and Pilcher's sign was positive. Retropharyngeal cellulitis with possible abscess was diagnosed and the chemotherapy then available was administered. His evening temperature was 101°F. On the 5th day the symptoms were rather worse. X-ray examination showed that the trachea was displaced forwards with posterior deformity; and translucent areas were present, indicating a collection of gas. A barium swallow showed partial obstruction. I came to the conclusion that the patient was suffering from a retro-œsophageal abscess, which should be drained.

Under general anæsthesia I made a transverse incision just above the clavicle, dividing the anterior part of the sternomastoid. The incision was deepened by blunt dissection, and in the retro-œsophageal cellular tissue an abscess was found, which contained gas and about 1 oz. of thin, foul-smelling pus. Sulphathiazole was dusted into the cavity, which was drained. A temporary gastrostomy was carried out. Culture of the pus showed *Streptococcus viridans* and diphtheroids.

Recovery was rapid: 9 days later the patient was swallowing normally, and 3 weeks after the drainage of the abscess I was able to carry out a partial gastrectomy. Convalescence was uninterrupted and the patient has remained well. An account of this case has been given by Grey Turner.[1]

The site of injury in this case was the same as in those described by Mr. Goligher; it may be, however, that in this type the harm is done not during the introduction of the instrument but through pressure during the subsequent examination. This danger is likely to arise if the examination is unduly prolonged in order to let several onlookers look down the instrument.

R. H. FRANKLIN.

Postgraduate Medical School of London,
Hammersmith Hospital.

AN INTERNATIONAL STANDARD FOR STRETCHERS

SIR,—In the early days of the "Geneva Committee for Aid to the Wounded," the historic forerunner of the International Red Cross Committee, its founders emphasised the importance of the exchange of ideas, and of coöperation with the medical services of the various Powers. Henri Dunant, in particular, was much concerned about improvement in the means of transport of the wounded, the "universal" adoption of approved methods of treatment, and the institution of a "veritable museum" of military equipment.

A definite proposal for the general use of a stretcher of standard dimensions was made by Colonel van Baumberghen at the International Congress of Hygiene held in Berlin in 1907; but this proposal does not seem to have been followed by any immediate action. During the war of 1914–18 the diversity of types of stretcher in use by the various Powers came into distressing prominence. The measurements of French, British, American, and German stretchers differed so much that each stretcher was suited for transport only in an ambulance of corresponding national origin. Thus the wounded had at times to be transferred from one stretcher to another—a process inevitably painful, often dangerous, and always involving loss of time. As the French General Marotte remarked, "Never have the differences in the standard of equipment been so conspicuous and so prejudicial to the interests of the wounded." Even during hostilities conferences were held, including representatives of both sides, to try to reach some degree of uniformity in means of transport for the wounded, but with no success.

In 1921 at the 10th International Red Cross Conference, the first to be held after the war, Senator Ciraolo (Italy), president of the International Relief Union, pleaded for the adoption of a uniform standard of equipment by the different national red-cross societies, to facilitate collaboration in relief operations in the case of civil disasters. At the 12th International Red Cross Conference, held in Geneva in 1925, the president, Dr. Reverdin, said: "It is of the utmost importance for the wounded that the dimensions of all stretchers should permit of their adaptation to every type of carrying fitment and vice versa." A standard of dimensions, recommended by the commission, was adopted by the Red Cross Conference held at the Hague in 1928, subsequently modified by the Brussels Conference in 1930, and finally approved by the Tokio Conference of 1934. This model, however, did not win the approval of the various national medical services, and the outbreak of the war of 1939–45 found us still without an international standard of stretchers.

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[1] Turner, G. G. Injuries and Diseases of the Œsophagus. London, 1946.

Civil defence against air-raids even added to the number of different types of stretcher. In England passive defence was undertaken by the specially created Air Raid Precautions Department of the Home Office, which used a rigid stretcher with the poles consisting of cast-iron tubing and the beds of iron-wire mesh. The all-over dimensions of the British Army stretcher were adopted, but the feet, consisting simply of downward salients on the poles, were too wide for the grooves in Army ambulances. Of the three main types of stretcher in use in England—British, American, and A.R.P.—none were interchangeable. Ultimately a simple adaptation of the width of the A.R.P. stretcher-racks permitted the carriage of both American and British Army stretchers in A.R.P. ambulances. An awkward feature of all three types was the length of the rigid poles, which prevented their introduction into most hospital lifts.

It is obvious that a stretcher of standard dimensions could meet most, if not all, occasions, both civil and military; indeed the argument in favour of a universal type applies not only to armies but also to civil institutions and voluntary organisations. The outbreak of the second world war called a halt to the activities of the standardisation commission of the International Red Cross; but it is hoped that, in view of the first post-war International Red Cross Conference due to be held in Stockholm next autumn, the commission will be given a new lease of life and will this time attain success.

Geneva. R. T. WELLS.

CHARMS

SIR,—Reading again the history of medicine the other day, I came across the following cure for mental illness, popularly prescribed by doctors in the Dark Ages: "Take clove wort and wreathe it with a red thread about the man's neck when the moon is on the wane in April or October; soon he will be healed." In view of Dr. Inman's successes with the burial of a sliced potato in the backyard by the light of the full moon, reported in your issue of July 10, I am wondering whether a revival of the older remedies is not indicated! The opinions of other psychiatrists are solicited.

Park Prewett Hospital,
Basingstoke.

I. ATKIN
Physician Superintendent.

SIR,—Dr. Inman's wart stories (July 10) provide good dramatic reading. That is why they continue to be interesting at each of their periodical revivals. Heaven knows how often one has read similar descriptions.

But Dr. Inman seems to go out of his way to invest his particular ritualistic form of treatment with an atmosphere of mystery and superstition. Mystery there is, in the sense of an unsolved problem as to the psychodynamics of warts and their disappearance under different modes of suggestion. If, however, Dr. Inman means that his treatment is a method of suggestion, why does he not make this evident? Is "charming" a wart a clearer or more instructive phrase? Allowing for the indefiniteness of the conception of suggestion, the use of the word does at least leave the problem a psychological one. He surely *cannot* mean more, since his knowledge (as distinct from speculation, which may, admittedly, be true) of the pathogenics and pathoplastics of the cases described remained exactly the same after he had "cured" them as before. In other words he knew as little about them after his successful treatment as he did before. Or does he, in fact, mean more? Is he implying that by his ritual he called in (or out) white and friendly spirits to help him? He may have forgotten that when Glendower declared he could call spirits from the vasty deep, Hotspur replied: "Why, so can I, or so can any man; but will they come when you do call for them?"

I should be interested, furthermore, to learn if Dr. Inman considers he has done the small boy of 8 any psychological harm when he told him to steal the and, after touching the warts with it, to bury i the backyard (with superstitious solemnity) by the of the full moon—the whole hocus-pocus to be out with the greatest secrecy? And how did a boy of 8 manage to do all this without his m becoming aware of it? Was he told to get up out of in the dead of night and creep into the backyard?

If Dr. Inman believes that it is desirable that wor in the subject should help to get psychology on t proper scientific plane, I suggest that his approach the wrong one. If he feels he must use potatoes saliva (perhaps he has delicately refrained from tioning other organic reagents), he might at least w out a technique that does not encourage a belief superstition and animism.

London, W.1. FREDERICK DILLO

TROTTER'S TREATMENT OF EPISTAXIS

SIR,—An anonymous past pupil of mine has recen thanked me in the *Guy's Hospital Gazette* for teac him Trotter's method of treating nose-bleed and "I have never heard of it elsewhere. Probably t well-known." This last statement is, I believe, incorrec for I have never met one of my colleagues who has u it, nor a student of any of them to whom it has taught.

I tumbled on Trotter's treatment of epistaxis in th sitting-room of an East-End doctor where I was waitin while he attended to one or two patients before going t a consultation with him. I picked up the current numb of the *Medical World* (Oct. 6, 1933) and started to rea an address on Emergency by Trotter that the editor had wisely reprinted from the *University College Hospita Magazine*. In it was incorporated his treatment o epistaxis, which impressed me at once. This addre has been given first place in the collection of Trotter papers by his son (Oxford University Press, 1941). H is the passage:

> "Prop the patient well up with a comfortable incl to one side, arrange a large pad of wool for him to into, put a dental prop between the teeth, *forbid breathe through the nose or to swallow*, and give a sub dose of morphia."

My first case was a doctor's elderly brother. I no dental prop; but there was a wine-cork in the h I have used a wine-cork—or one from a large medi bottle—ever since. You cannot swallow without shutt the mouth, but blood or mucus coming into the pha from the nose sets up the reflex when it touches t upper surface of the soft palate. If the patient is the right position with the nares lower than the cha this does not happen. The blood runs into the "la pad of wool."

I have never known this treatment of severe epista to fail except in the hands of house-surgeons who li "doing things." Trotter says "supposing you wis make a serious attempt in such a case to avoid t recognised but odious alternative of plugging the nose but there are some persons who really enjoy perform this "odious alternative," with the result that t do not pay enough attention to the position of the to the adjustment of the cork, and, above all, to "comfortable inclination"; then the treatment and they have an excuse to plug.

My greatest triumph was at St. James Hospital, Balham late Dr. W. L. MacCormac came to me, just as I was about a man who had been thrice transfused. He su *that I should perform an operation described* by in which the antrum was opened and then a counter made in its posterolateral wall through which the term of the internal maxillary artery was ligatured. I coul imagine myself doing such a thing; and to gain time whether they had tried Trotter's treatment. He did not it. By that time we had reached the man. He looke I told Dr. MacCormac that I was busy that afternoon could return at 5.30. In the meantime I thought it w trying Trotter's treatment; so we set about instituti and I went away leaving a telephone number in case th got worse. Actually I had nothing to do that day. I my consulting-room working at my income-tax retur 4.30 when I rang up the hospital. The bleeding had sto

;ave another telephone number and went and sat in my ringing up again before going home. The bleeding recurred.

ortly after reading that address I met Mr. Trotter poke to him about it. He went as near to registering ement as I have ever seen him do. He told me ad tried it on himself when his nose bled in an k of influenza. Fortunately, he said, his wife was out could do what he wanted instead of having to send colleague. He had thought the treatment out some before, and so he went to the closet and stood over an in the desired position and the bleeding stopped ice.

went on to tell me the rationale of the treatment. pends on the adhesion of the clot to the vessel wall. veins of the nose (the bleeding is usually, if not ys, venous) all stream back to pass through the iopalatine foramen; and as they do so they are d in grooves on the medial aspect of the turbinal s, with the result that if there is any tug on them is exerted on the free-side of the vessel which is not aced from its bony bed. Therefore such a tug pulls vessel wall from the underlying clot while this is in ss of becoming adherent. The clot becomes detached the bleeding recurs. The sphenopalatine foramen ust above and behind the hinder end of the middle nal. It is therefore at the junction of the nose and pharynx. Every time the soft palate goes up there initial negative pressure before it descends again, his produces the tug on the veins as they converge on phenopalatine foramen. Inhibit movements of the e and you stop this tug. Thus the clot can become ent and the bleeding ceases.

is is hard to put into writing, but it was as clear as ght when Trotter spoke it.

idon, W.1. T. B. LAYTON.

THE ROYAL COLLEGE OF SURGEONS

R,—Lord Webb-Johnson's reply in your issue of 3 ignores the essential point in our previous letter— ely, his suppression from the medical profession of esolutions passed at the fellows' meeting on April 28. suppression is maintained in Lord Webb-Johnson's r, in which, while mentioning the second and third utions, he does not disclose their nature.

OY DINGLEY
RLES HAMBLEN-THOMAS
HOSFORD
MAN A. JORY

REGINALD L. MURLEY
REGINALD T. PAYNE
ALEX. E. ROCHE
W. ETHERINGTON WILSON.

VENEREAL DISEASE

R,—In his letter in your last issue, Lord Horder is less o date than usual. He refers to the appreciable ase in syphilis and gonorrhœa reported for the 1945, but his purpose would have been better served he referred to later figures; for demobilisation the Army of Occupation between them were to a further rise in 1946. Latest figures, however, a decline, particularly in syphilis.

or many years (both by private instruction at clinics from the public platform) I have advocated personal fection as one of the means whereby the incidence D. could be reduced; and other medical men have the same. During the late war I had the privilege elping some of our Allies to improve methods of ical disinfection. The National Society for the ention of Venereal Diseases might, therefore, I think, me as an ally; but I part company with them they pretend that the spread of knowledge on fection will bring about the elimination of V.D.

rd Horder talks of "a great campaign to set the le free from V.D.," saying that "the scope and itude of this great attack depends upon the support eceive from the profession and from the general ic." And what is his great campaign? To tell the l the virtues of urination after coitus, soap and water, sium permanganate solution, and calomel cream! peaks of a scientific fact known for 40 years, but we iving now in a penicillin era in which it is claimed a single injection, taking less than one minute to inister, can cure 90% of cases of gonorrhœa. Gonorrhœa has largely been robbed of its terrors for man, woman, and infant.

A quarter of a century ago, the Trevethin Committee, gave its blessing to "properly and promptly applied disinfection," but no-one who understands the significance of the operative words "properly and promptly" will suggest that the average man, however well instructed, will, after venery, efficiently disinfect himself; and Lord Horder knows that the relatively successful disinfection in the Fighting Services during the war was carried out largely under skilled supervision, which he does not propose for the civil community.

The Trevethin Committee recommended also the trial for a period in a limited area, of powers to compel defaulters and suspected sources of infection to undergo treatment. Far more is to be expected from tracing and treating contacts than from teaching disinfection, although both are required. By all means tell the public about calomel and Condy's fluid, but tell them also that in England today there is no law to assist the V.D. officer and the medical officer of health to bring under treatment men and women known to be spreading gonorrhœa and syphilis, the contacts of fresh infectious cases, the man who has infected his wife, the wife who has infected her husband, the parents of infected children, or the brothers and sisters of young congenital syphilitics.

Brentwood. ROBERT FORGAN.

PAIN

SIR,—Dr. Keele's (July 3) method of recording pain is certainly appropriate for testing the efficiency of analgesics. But he omits consideration of sensitivity. If in one individual sensitivity to pain were always the same, we might ignore it altogether; we could compare the effects of, say, morphine and distilled water on this particular individual, as Dr. Keele has done. But if we assume that sensitivity even in the course of the same illness is different at different times; if we assume, for instance, that sensitivity is greater during the first minutes or hour after a period of freedom from pain, or that sensitivity to pain wears off the longer it lasts (and these are quite feasible assumptions)—then the conclusions about the effect of an analgesic appear in a very different light.

For example in chart 5, distilled water was ineffective when the pain had lasted only 2 hours, but pethidine was effective when it had lasted 4 hours. May not this difference be explained, partly at least, by the time factor and a reduction in sensitivity due to this lapse of time? In chart 6, pethidine was ineffective when the pain had lasted 1 hour, but distilled water was effective when it had lasted 5 hours. Does this observation prove, as Dr. Keele thinks, that the pain in this case was psychogenic, or was it partly due to the fact that after 5 hours the pain was felt less keenly and was therefore more responsive to medication?

I think that the factor of sensitivity cannot be left out of consideration; but this recording of pain may help in determining how sensitivity is correlated to the time factor. Perhaps a record of untreated pain would be useful, though it might be difficult to achieve this humanely.

Alverstoke. W. J. PINOFF.

ABNORMAL PERIODS OF GESTATION

SIR,—In my early years as a surgeon I often had to deal with obstetric abnormalities, and I still have notes of some unusual cases. In the light of last week's article, the following case-report may interest some of our legal friends.

In May, 1929, a farmer's wife, aged 37, pregnant for the second time, was sent into hospital, and gave a history that her first child was born 9 years previously, after an 8 months' pregnancy. Since then her menstrual periods had been somewhat irregular, the intervals varying from 3 to 6 weeks. Her last period began on June 10, 1928. She made a note in her diary of coitus on June 30. Medical induction of labour was attempted on May 13. The child, weighing 8 lb., was born on May 18, after a gestation period of 342 days.

This is the story, for what it is worth. I had no reason to doubt the accuracy of the patient's statements.

Northampton. C. C. HOLMAN.

Public Health

HEALTH AND DISEASE IN 1946

MINISTRY'S REPORT

THE year 1946 was one of transition from the activities of war to those of peace. This is reflected very clearly in the report for that year of the Ministry of Health's chief medical officer,[1] Sir Wilson Jameson. He alludes, for example, to the general downscaling of the Emergency Medical Service's work; and to the return of Servicemen from overseas, which accounted for a rise in the birth-rate (though the peak was not to be reached until 1947) and also for a rise in the number of reported new cases of syphilis. For the Ministry this year of redistribution had its special problems, one of which proved to be the risk of smallpox dissemination by Servicemen returning by air from the Far East. In general, however, this, like its war-time forerunners, was a year of good health.

STATISTICS

As a result of the rapid demobilisation after mid-1945 the mean population of civilians in England and Wales increased to 40,745,000, compared with 38,157,000 in 1945. The birth-rate, which had declined in 1945, rose to 19·1, while the civilian death-rate fell to 12·0—a level around which the crude death-rate fluctuated between the two wars. The causes which continued to account for increasing numbers of deaths were cerebral hæmorrhage, cardiovascular disease, and cancer; these groups, together with senility, accounted for 63% of non-violent deaths. Infant mortality fell sharply, after a slight setback in 1945, bringing the rate to a new low level of 42·9; and deaths in each year of age up to 5 also declined to new low records.

INFECTIOUS DISEASES

Smallpox.—There were 56 cases, of which 14 proved *fatal. All the cases, which made the largest total* since 1934, arose during the first six months of the year and in circumstances suggesting that the infection originated in India. It was repeatedly observed that when smallpox of the major Asiatic variety attacked vaccinated patients, whose immunity had presumably begun to wane, it assumed a clinically mild form, with a modified and sparse eruption. Such cases sometimes went completely unrecognised, but they were nevertheless highly infectious. The report suggests that successful control of imported smallpox depends on: (1) prompt recognition and isolation, aided by laboratories able to carry out serological tests and the culture of variola virus; and (2) identification, inspection, and prompt vaccination of all probable contacts, using at least two insertions, followed by daily surveillance for at least 16 days from the last exposure. Each of the 3 cases of postvaccinal encephalitis was in a patient who underwent primary vaccination at school age or later.

Diphtheria.—The corrected number of notified cases was 11,986, and of deaths 472. For 1945 the comparable figures were 18,596 and 722; and, for 1944, 23,199 and 934. It is noteworthy that of the "protected" children with a known history who died of diphtheria in 1945, none had received a boosting dose of prophylactic; the period between the date of protection and of death varied from a few weeks to ten years, the majority having been protected more than four years previously. The report records, as an object-lesson, an outbreak traced to two domestic servants, of whom both had septic skin lesions and one otorrhœa; *Corynebacterium diphtheriæ* was isolated from the skin lesions ear discharge but not from the nasopharynx.

Scarlet fever.—The regression in numbers cont there were 56,730 cases and 43 deaths. The report

> "Where possible, *patients suffering from* streptococcal throats, whether of scarlet fever type or not, are best at home, rather than in a multiple bed ward of an hospital with its multiplicity of types, each capable of cross infection. In an outbreak of so called scarl it is essential to deal with all cases of streptococcal inf

Measles.—This was in the minor phase of its b epidemicity. There were 160,402 cases and 204 d Of recent years the virulence of the virus has dimini the true hæmorrhagic form has disappeared, "and an ill-omened complication as cancrum oris is a of the past." Since most deaths take place in the you age-groups, the best hope of reducing mortality h postponing the age of attack.

Rubella.—Accounts of congenital defects in chil born of mothers who had rubella in pregnancy prom the Ministry to initiate an investigation in conjunct *with some of the larger welfare authorities.* The r gestion that rubella should become notifiable is reject

Common cold.—By the end of the year the established at Salisbury by the Ministry and the Med Research Council had established that filtered mater stored at −70°C for $4^1/_2$ months retains its cold-induc properties, which are, however, lost after 3 days' stora at 4°C.

Cerebrospinal fever.—Since the eightfold rise notifications between 1939 (1500 cases) and 1940 (12,77 numbers have declined, but the 1946 total (2673) is above the level of 1141 cases per year between 1936 1938. Fortunately the case-mortality, which was in 1930, has fallen and in 1946 was 25·3%. Th tinued high prevalence is, however, disturbing: prevention the first aim should be to lower the rate.

> "Paramount among the general measures is the av of overcrowding. . . . chemoprophylaxis now offers specific protection. The general administration of doses of sulphadiazine, one gram a day for three d reported to have brought down high carrier rates of 50 per cent. in military units to a very low level and to terminated outbreaks of meningitis immediately."

Enteric fever.—The Public Health Laboratory S has undertaken to place its resources at the disp medical officers of health; and it should be possib compile a national register of carriers of partic Vi-phage types of typhoid and paratyphoid h leading to the avoidance by these carriers of f handling and other potentially dangerous occupati "Had it been possible to apply such control years ago the Aberystwyth outbreak might have averted."[2]

Jaundice.—In the area where jaundice was not the rate per 1000 of the population was 0·7, the h figures appearing in April and May. Through country the aggregate of deaths from acute atrophy, hepatitis, jaundice, and catarrhal j exceeds 500 a year. "If half of these deaths be infection . . . communicable jaundice has of lat killing more than scarlet fever, the dysenteri enteric fever."

Malaria.—The report records the case of a woman to whom the infection was conveyed by transfusion shortly before delivery. Subsequentl developed malaria, and quartan parasites were fou her blood; but the child escaped infection. The d was found to be a carrier of quartan parasites.

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[1] Report of the Ministry of Health for the Year ended March 31, 1947, including the Report of the Chief Medical Officer on the State of the Public Health for the Year ended Dec. 31, 1946. H.M. Stationery Office. Pp. 204. 3s. 6d.

[2] See Bevan, G., Sudds, M. V. N., Evans, R., Parker, M. T., I., Sladden, A. F. S. *Lancet*, 1947, i, 545.

ereal disease.—The number of new cases of syphilis ling treatment centres rose from 5214 men and women in 1945 to 10,705 men and 6970 women in The increase was caused largely through bilisation; but there was also evidence that ion was imported from the European mainland. ver, infantile congenital infections rose only slightly n 326 to 363. That the promiscuous woman is nain reservoir of infection not only for syphilis lso for gonorrhœa is indicated by the clinic figures is disease. In 1945, 21,280 men and 11,603 women led for treatment. In 1946 the male cases rose ,912, whereas the female cases fell to 10,431. As nicillin:

p to the present, there is no certain evidence that nt strains of gonococci are in circulation, and the great ity of relapses are cured by re-treatment with penicillin." treatment of syphilis, "the discovery that commercial llin has been liable to contain an undefined proportion e less efficacious penicillin IV(K) has justified the ry's decision not yet to recommend its exclusive use."

berculosis.—In the war years deaths averaged 0 and the rate 619 per million. In 1946 a new ecord for both respiratory and other forms was lished, total deaths numbering 22,847 and the rate 533.

here is, however, no room for complacency in face of a e which still causes nearly one-third of all deaths at 15 to 39. Mortality from respiratory tuberculosis in ountry is highest among young women and men of e age. The rate for men over 65 has shown a subal increase since the war, due, it may be presumed, to visations of lesions which might have remained dormant or the strains and stresses of war."

spite an increase, in 1945 and 1946, of 2440 in the ber of beds provided, the battle of the waiting-list being lost. The main (88%) reason for non-availty of empty beds was shortage of nursing and estic staffs.

to the end of 1946, 1,369,014 people had been examined nass radiography. Of those examined 95% were found ave no abnormal chest condition. Previously unsusd active tuberculosis was found in 4 per 1000; and ive tuberculosis, excluding calcified primary lesions, %. Of other conditions, acquired cardiovascular lesions detected in the same proportion as was active tuberis: bronchiectasis was found in 1 per 1000 of males and er 1000 of females; intrathoracic malignant disease was ted in altogether some 170 cases; and retrosternal oid in some 80 cases. Of those recalled for further ination over 97% responded.

MATERNAL DEATHS

e Ministry received confidential reports on 769 rnal deaths; and in 284 of these, investigators found ssessable avoidable factor.

Investigators' conclusions	*No. of maternal deaths*
ack or inadequacy of antenatal care	86
ack of coöperation by patient or her friends ...	70
ack or inadequacy of obstetric facilities	59
ack or inadequacy of hospital or specialist treatment	46
oor general health or malnutrition	18
isk of pregnancy should not have been undertaken	3
nsatisfactory home conditions	2
	284

FOOD AND NUTRITION

e introduction of bread rationing in the second half e year meant the abolition of the main reserve from h requirements above the average could be satisfied. extraction-rate of flour was again raised to 85%.

e body-weight surveys of the Ministry of Food revealed line of about ¾ lb. in the average weights of adults aged 34 years since the middle of 1945, compared with a fairly steady increase, of 2–4 lb., from 1943 to 1945. On the other hand, data for heights and weights of school-children (available only up to mid-1946) show that improvements in height and weight of the later war years were on the whole being well maintained.

HOSPITALS

At many hospitals priority in building was given to the provision of improved amenities for staff. In one representative region nearly a third of all the projects approved, and about half of the estimated expenditure, was in respect of nurses' homes. The adaptation of emergency hospital huts to a variety of general and special uses was put in hand. High priority was given to maternity buildings.

MONTHLY SURVEY OF SICKNESS

The chief features brought to light by the Social Survey's monthly review from 1944 onwards were a pronounced fall in minor complaints during the spring and summer of 1945 (perhaps connected with the ending of the war), high levels for such ailments at the end of 1946, and an apparent increase in more serious illness amongst elderly women throughout 1946.

Among those under 65, varicose veins accounted for about 1½ days lost per 100 people each month, and cardiovascular disease for 2½ days lost. From all kinds of illness and injury the average of days lost each month per 100 people was 114 for men and 86 for women.

In his introduction to the report Sir Wilson Jameson acknowledges the medical profession's work in these words: "Posterity, remembering the straitened means at their command, will, I think, wonder at their achievement in this troubled post-war year."

Parliament

"Medical Black Market"

IN the House of Commons on July 20 Miss A. M. BACON spoke of a black market being created by a minority of doctors who were refusing to accept on their lists patients whom they believed capable of paying high fees or those who needed extra attention, such as old people, children, and the chronic sick. Another type of doctor "more subtle, but no less sinister," agreed to accept patients but told them that they would not get the same attention, or the same drugs, as when they paid fees. "Doctors are losing many friends," said Miss Bacon. "Many people who opposed the health scheme would now be in favour of a full-salaried service. These practices are bringing the scheme into ridicule and contempt. They are a travesty of the humane spirit in which the Act was conceived."

Mr. ANEURIN BEVAN, Minister of Health, said that the practices described were carried on by a very small proportion of doctors: the vast majority of the profession regarded such conduct as quite intolerable. For a practitioner to accept some members of a family as his patients, while refusing one or more of the others cut right across the conception of a family doctor. The scales of remuneration for the profession were drawn up on the assumption that the whole population might be in the scheme, and the standard of remuneration for practitioners was higher than that of 99% of other people. Where doctors were saying to potential patients that they could afford to pay, they were in most cases saying it to people whose income was lower than their own: and there was no justification on financial grounds for this discrimination. Mr. Bevan went on to suggest that an area where a doctor or doctors accepted patients only in return for fees might be regarded as under-doctored. This would be a matter for the Medical Practices Committee. The practitioner was expected to provide adequate facilities for his patients, and it would not be considered proper for a practitioner to provide superior facilities for his private patients as against his public patients. He was asking local executive councils to look into this matter immediately.

Food-supplies and Nutrition

In the House of Commons on July 12 Mr. J. S. C. **Reid** said that a year ago some people still argued that ours was a well-fed nation and that there was no need to worry about the future of our food-supplies. But the Economic Survey for 1948 set out the precise respects in which there had been a fall in the consumption of a number of commodities, and stated that it would be wholly misleading to infer that the real standard of life had remained, and would remain the same. The figures showed that the food available during the year had, on the average, diminished by 200 calories per head per day. Mr. Reid did not attach primary importance to that figure: it would be of primary importance only if there were equality of sharing of the food available. This, of course, was not the case: a great many quite properly got more than the average through canteens, school meals, and extra rations, and a great many people therefore got less. It was time that the Minister re-examined the method of his department in deciding who was to get extra allocations of food. Applications were never refused because the applicant did not need the extra food, but always for some administrative reason. Mr. Reid appealed for an end of the "sorry business" of bread rationing, and for a lowering of the extraction-rate for flour.

Mr. **John Strachey**, Minister of Food, hoped and trusted that the time would not be long delayed when bread rationing could be ended. Obviously, too, the Government would like to lower the extraction-rate further, and he agreed that if it could not be lowered by 5% it would be well worth the while to lower it by $2^{1}/_{2}$%. If he were in a position to do that he would certainly do so, but he would give the ending of bread rationing priority.

It was perfectly true, he said, that last autumn the nutritional prospect for the first six months of 1948 was a dark one indeed, and his nutritional and scientific advisers had looked forward to that period with the greatest apprehensions. But as a matter of fact the calorie level remained almost exactly 2800, and did not fall below 2700 as they had feared. This was done by switching from dollar sources of foodstuffs to sterling and other currency sources. Even 2800 calories, however, was a low figure, and only just sufficient. Therefore it was essential to have the fairest possible distribution. If food subsidies were abolished, fair sharing would be impossible: the steep rise in prices which would immediately take place would sharply cut down working-class consumption. If people asked what value they were getting for these subsidies—which were now running at something like £470 million a year—he asked them to look first of all at our children. After examining children in our schools Prof. Henri Bonnet, of the French Academy of Medicine, said: "In 10 years, England will have a generation of young men and women superior, physically and mentally, to those of any other European country. I am convinced that the excellent physical condition of these children is due to their feeding. Their diet is perfectly balanced, and the system of milk in schools, school feeding and extra vitamin nourishment provided by clinics has had obvious results." The percentage of school-children receiving meals in schools was now 52, compared with 4 before the war.

Dealing with the world food situation, Mr. Strachey said he did not think there was any necessary conflict between his views and those of Sir John Boyd Orr. Sir John was assuming that the vast populations of China, India, and the like must be brought up for the first time in human history to a satisfactory level of nutrition. That was something which everyone would pray for and wish to advance, but it was something altogether outside the scope of anyone speaking for the British Government. It could only be handled by these people themselves. He (Mr. Strachey) spoke only of the world food situation at the current level of effective demand. If that level was raised, as it easily could be if everyone in China and India secured adequate food, then the world would be desperately short of food for a very long time. But at the current level of effective demand it appeared to him that in the basic foodstuffs of rice and cereals we ought to see an improvement in availability the coming year. The chief lesson for us of th critical nine months we had been through betwe convertibility crisis of the European Recovery gramme was that the great food-producing co had as much need of us as we had of them. The he believed that, as long as we had an industrio ingenious population producing manufactures i country, we could be assured of feeding ourselves.

Dr. **Edith Summerskill**, parliamentary s to the Ministry of Food, replying to the debate, tribute to the work of Sir John Boyd Orr, M.D., F. director of the Food and Agriculture Organ At two conferences of the F.A.O. she had delegates from every part of the world listen to Sir with respect, admiration, and affection. He wa only a great scientist and a great humanitarian but been one of our finest ambassadors. If it was true posterity remembered those who benefited post. Sir John Boyd Orr could never be forgotten.

The population of the world, said Dr. Summ was increasing by 25 million a year. The great Dom of Pakistan and India intended to eliminate illit and when that was done it would inevitably mean peoples would demand a standard of living compa to those enjoyed in the west. Not only would t population increase, but their expectation of life wo also increase. Malthusian doctrine, which was discred in the 19th century, would perhaps be vindicated the end of the 20th.

Mr. **Emrys Hughes** suggested that Sir John Boyd O should be sent on a special mission to Moscow to whether Russia could be persuaded to come back t the F.A.O. and coöperate in a world food plan.

Housing Progress

Replying on July 14 to a debate on housing pol Mr. **John Edwards**, parliamentary secretary to t Ministry of Health, said that in May, 1947, 21 out of a total labour force of 480,000 in Engla Wales were employed on housing work. The co figure for May, 1948, was 220,000 out of a tot of 481,000. In the summer of last year it was that the desired spread of housing had been o and that in order to secure the completion of h already in the programme it ought not to be overl with additional contracts. The decision to restr retard the number of new contracts was not a de to cut down the housing programme, but simp necessary step to secure the more rapid completio houses for which contracts had already been let. result was a much better balanced programme. number of houses completed in relation to those construction had increased from 1 to 18 in May, to 1 to 10 in May, 1948. The Government's present was to keep the volume of building constructi England and Wales at approximately 180,00 houses.

Speaking later, Mr. **Bevan**, Minister of He announced that permanent new houses were completed at the rate of 20,000 a month. Th were good reasons, he said, why waiting-lists for h were no longer an expression of housing needs the end of the year he was going to ask local auth to "vet" them.

A motion by Mr. **Walter Elliot** to reduce Ministry of Health vote was negatived by 303 votes

Proprietary Medicines

On July 12 Mr. A. M. **Skeffington** said that it a little ludicrous and illogical that, when the was spending possibly £100,000,000 a year on services, the advertising of proprietary medicines encourage self-medication, with its obvious danger.

Sir **Ian Fraser** pointed out that proprietary med were subject to $33^{1}/_{3}$% purchase-tax, which natu raised their cost. Not everyone could see a d there was a shortage of doctors, and many of preparations were identical with those recomm by the medical profession.

Mr. **Edwards**, parliamentary secretary to the Mi of Health, said that voluntary efforts had been ma some of those most directly concerned to keep ext gant advertising of proprietary medicines in y that, under the National Health Service, everyone ld have the medicines prescribed by their doctor necessary, there was less reason for people to buy licines for which misleading claims were made.

Supply of Artificial Limbs

n the House of Lords on July 14, in reply to Lord NCROFT, Lord MORRISON stated that under the ional Health Service an artificial limb, where required, ld be supplied free. Normally the limb would be of same type as the limb now supplied to disabled Servicemen by the Ministry of Pensions through r own contractors. But it would be possible for one to elect to be fitted with another make of limb roved by the Ministry, provided that he accepted onsibility for any increased cost. This option would ly to all patients, including disabled ex-Servicemen.

ord WEBB-JOHNSON, P.R.C.S. (who had that day been oduced and taken his seat) expressed satisfaction the Government's answer. This question, he said been a source of great anxiety to practising surgeons, only on account of patients at the moment, but also ause of the possible effect in preventing future elopment.

The Death Penalty

he House of Commons on July 15 considered the minal Justice Bill.

ir HARTLEY SHAWCROSS, Attorney-General, moved t the House should disagree with the Lords' amendnt to delete clause 1 (suspension of the death penalty murder). He urged the merits of the Government's posal to recognise two categories of murder—the ital and non-capital. He thought that juries would e no difficulty in deciding whether a murder came one of the five classes for which capital punishment reserved: (1) those committed in connexion with bery, burglary, or house breaking (gangster offences); unding by three or more persons acting together; ences committed with explosives or destructive subnces; rape, indecent assault, and sodomy; (2) murder a police officer, or a civilian who was assisting a police icer in the execution of the law; (3) poisoning when poison had been systematically administered; the murder of a prison officer; and (5) second murders.

Mr. WINSTON CHURCHILL said that the new clause l been put together with the object, not of making etter and more humane system of criminal justice, of getting around an awkward Cabinet or Parliantary difficulty. The Government's clause would aken the jury's sense of responsibility and introduce tinctions that would puzzle and baffle them, while its onsistencies and absurdities would tend to bring the into disrepute. The most frequent types of murder, h as wounding, stabbing, and drowning, and the st wicked murders, would not carry the death penalty.

Sir JOHN ANDERSON thought the new clause unsatistory because it sought to substitute a rigid and borate statutory code for the existing flexible, welld system. He thought that the words "express lice" would give rise to serious difficulty. The only sible and sensible course for those who believed that capital sentence was an unavoidable evil, and would to see it got rid of to the fullest possible extent l as speedily as possible, was to proceed by the rcise of the Royal prerogative. Mr. CHUTER EDE, me Secretary, on the other hand, believed that the ler use of the Royal prerogative would involve the me Secretary in considerable difficulties. The Governnt had put before the House a method by which ady amelioration of the law could be carried forward a way that would not violently offend public opinion.

After a series of divisions, the Government's commise clause was carried by 307 votes to 209.

QUESTION TIME

etropolitan Police Officers and the Health Service

ir E. GRAHAM-LITTLE asked the Home Secretary what lical arrangements had been provided for the Metropolitan ice under the new Health Insurance Act and, in particular, ether they were insurable under the Act and would have free choice of doctors or be attended by their divisional surgeons as up to the present.—Mr. C. EDE replied: Members of the *Metropolitan Police Force, like other police officers, are* now compulsorily insured under the National Insurance Act and the Industrial Injuries Act. In view of the establishment of the National Health Service, Police Regulation 88, under which police authorities were required to provide free medical attention for police officers, has been revoked, and police officers, like other citizens, have free choice of doctor. I understand that the majority of the divisional surgeons in the Metropolitan Police District have joined the National Health Service. Accordingly police officers who wish to continue to receive attention from their doctor will be able to do so.

Obituary

GORDON WILKINSON GOODHART

M.A., M.D. Camb., F.R.C.P.

Dr. Goodhart died at his home in London on July 16. He retired last year from his post as pathologist to the London County Council group laboratory at St. Mary Abbots Hospital, and would have been 66 on July 24 of this year. The younger son of Sir James Goodhart, of Guy's Hospital, and heir presumptive to the baronetcy, he was educated at Westminster School, Trinity College, Cambridge, and Guy's, where he became successively house-physician, Gull research student, demonstrator of pathology, and senior assistant bacteriologist. Later, at Freiburg, he worked for a time with Aschoff, before becoming clinical pathologist at University College Hospital. During the 1914–18 war he served in France in the R.A.M.C., and was pathologist to the 2nd London General Hospital. Of his next few years, W. G. B. writes:

I first met Goodhart in October, 1923, when he was clinical pathologist to University College Hospital. His laboratories, at the top of that building were extremely well run and he was freely consulted by all the clinicians there. It was a distinguished staff—Sir John Rose Bradford, Martin, Batty Shaw, and Poynton, with Bolton, Elliott, and Sir Thomas Lewis as junior physicians. A visitor to Goodhart's laboratories would immediately be struck by the general atmosphere of friendliness, and at the same time by the high standard of accuracy and the spirit of investigation which spread through the laboratory from Goodhart to all his assistants and technicians.

At this time he was actively engaged in research with Bolton on gastric secretion and the neutralisation of stomach contents, and with Price-Jones in investigations of the blood. A. E. Boycott, who was professor of pathology, had worked at Guy's and had brought Price-Jones with him; so Boycott, Price-Jones, and Goodhart were all well known to each other before their collaboration at University College Hospital.

Goodhart was interested in all aspects of pathology, and his contributions to them were mostly in the teaching of his students and the training of his assistants, most of whom have since achieved distinction. His work with Bolton was outstanding, and as a hæmatologist he was greatly distinguished. As a man he was extremely friendly. He was a great story-teller and could give long and interesting accounts of the many people with whom he had come into contact since his boyhood. Although these tales might take long in the telling, they never bored; they were always suffused with kindness, and were generally highly entertaining. He was extremely happy in his family life and enjoyed to the full his very large circle of friends, by whom he will be greatly missed.

In 1931 Goodhart left U.C.H. and played a great part in the establishment of the highly successful pathological services run for and by the London County Council. He worked first at the Archway group laboratory, and later, when a new laboratory was opened at St. Mary Abbots, he moved there. He was, at various times, president of the section of pathology of the Royal Society of Medicine, of the Medical Society of London, and of the Association of Clinical Pathologists.

In 1914 he married Alice Stransham La Touche and they had two daughters and a son.

WILLIAM AUSTIN ROBB

M.D. LOND., F.R.C.P.

Dr. W. A. Robb, pathologist to the Royal Devon and Exeter Hospital, died at his home on July 12, at the age of 55. Born at Burnt Fen, near Ely, he came of Suffolk yeoman stock and in youth hoped to become a veterinary surgeon. His passion for the country and for animals never left him; but by pure chance he took up pharmacy, and in this he showed such aptitude that he had taken the major pharmaceutical diploma by the age of 21. On the outbreak of the 1914–18 war he enlisted at once in the R.A.M.C., and in France he was sergeant-dispenser in the 36th Field Ambulance, in which his name became a byword for efficiency. The *Pharmaceutical Journal* of July 26, 1919, contained the following comment which bears this out: "I would like to compliment the man in charge of the dispensary of the 36th F.A. Had you seen his pharmacy under indescribable conditions you would have wondered how he did it. His officers used to marvel at him and were never tired of singing his praises."

In the German break-through of 1918 Robb was seriously wounded and taken prisoner while superintending the evacuation of casualties. On recovering in a German hospital, his work and care of patients of all kinds (German and otherwise) became so valuable that his captors pressed him to stay instead of going to a prisoner-of-war camp. Robb refused, in order to throw in his lot with his fellows, to whose service he devoted himself wholeheartedly. His war experience caused him to take up medicine, and in 1919, directly on demobilisation, he went to Barts from which he qualified in 1924, taking both the M.R.C.P. and M.D. in 1926. He became devoted to Langdon-Brown, to whom he was house-physician and chief assistant—a post he held until he could resist no longer the call of the country. He thus was led to Exeter in 1931, where he remained as pathologist until his premature death.

With his pharmaceutical background, it was natural that his experience was used, first as a teacher of practical pharmacology at Barts and later as a member of the revision committee of the *British Pharmacopœial Codex*. During the late war he added to his many appointments that of regional resuscitation officer in the E.M.S.

Such are the bare facts in the life of a character of great friendliness who will be sadly missed in the South-West. Austin Robb was of an all too rare type; thoroughly consistent to the root traditions in which he was bred. He was passionately fond of the country, and there were few parts of Devon of which he did not have an intimate knowledge gained from prodigious journeys on foot; he was able to surprise many medical colleagues by his knowledge of where their patients lived. His fondness for animals even led him to allow his chickens to wander through the flower garden "because it pleased them"! He was a loyal son of Barts and his home was a constant place of pilgrimage for his older and contemporary colleagues. He was a man of deep religious feelings without making it obvious; as a student these were coloured by his experience of life of a grimmer sort, and were more real than the adolescent gropings of the younger men who were his fellows. In later life he was a constant supporter of his church, and at the same time enjoyed life to the full. He lived well, he read prodigiously, he was a connoisseur of art, and he had a wonderful sense of humour.

In medicine his greatest achievement was of the unspectacular type, as a clinical pathologist. He was no pure laboratory man, though he established a first-rate pathological service. Technically he strove hard for perfection; he would not compromise with inefficiency or humbug. He made pathology what it should be—the basis of good clinical practice. In his office medical men came to discuss their pathological problems and went away enriched not only with the light of technical investigation but with a wealth of clinical sense; indeed with the illumination of a great physician.

As one who knew him as a friend and colleague, I would like to add one further note from the patient's viewpoint. Illness to Austin Robb was a personal problem not confined to physical signs and laboratory tests. As a patient one felt the whole impa his character: it was a chastening and invigo experience.

He leaves a wife and two children.

N. C

THE LATE CAPTAIN WATSON

A tribute to Captain Edward Clifford W R.N. retd., who died last August, reaches us J. B. G. S. who served with him in the late war. taking up medicine Watson had already had a tinguished career in the Royal Navy: in the first war he was an Admiralty consultant in radio prob After twenty years' service he retired with the rank commander, and he was later promoted captain on retired list. In 1930 he qualified as M.R.C.S. St. Mary's Hospital, London, where he held the post resident obstetrical officer before going into practice Twickenham. On the outbreak of the late war returned to the sea, and he served afloat throughout war, mostly in command of minelayers. "All so long out of touch with Naval affairs, he had for none of his seamanship and navigation; and he awarded the D.S.O. for services in minelaying while command of H.M.S. *Twistbank*. As medical officer *Twistbank* for two years, I had reason to be grateful his helpfulness. He was a man of strong personality good judgment, and considerable charm; his wi knowledge of general affairs was supported by de reading, and when we were in harbour he taught himse foreign languages. His last days were spent as heal adviser to the government of Trinidad."

Medicine and the Law

Similar Containers Again

AT a Birmingham inquest earlier this month t house-surgeon of a maternity hospital admitted th the death of a month-old infant was due to his mista in taking fluid from the wrong container for washing vein after a transfusion. He had used meth other instead of a saline solution. The deputy c recalled that a similar fatal mistake had been ma the same city at another hospital two years ago. press had reported this previous incident in 1946 local hospital managers must have discussed it; the lesson of the tragic error had not been applied. hoped that hospitals would take all possible steps prevent a further repetition. In particular he mentio the recommendation put forward by one witness in that containers of different colour should be used. T suggestion, he thought, would not only avert th tragedies but would also ease the surgeon's task giving him less to concentrate upon in the course of actual operation.

Appointments

BODOANO, AGNES, M.B. Manc.: pathologist, Keighley and Di Victoria Hospital, Yorks.

DAVIDSON, W., M.B., D.M.R.D.: asst. radiologist, Royal I Infirmary.

JOHNSTON, E. A., M.A., M.B. Aberd., D.P.H.: chief M.O.H., Inve shire.

McWILLIAMS, L. F., M.C., M.B. Belf., D.P.H.: asst. M.O. and Hucknall, Notts.

PHILPS, A. S., F.R.C.S.: surgeon i.c. eye department, St. B mew's Hospital, London.

WALKER, J. V., M.D. Birm., M.R.C.P., D.P.H.: M.O.H., Darli

Hospital for Sick Children, Great Ormond St.:

- COLE, PAULINE, M.B. Lond.: house-surgeon.
- DUDGEON, J. A., M.C., M.A., M.D. Camb.: asst. patholog
- GORDON, W., M.B.: house-surgeon.
- JOLLY, H. R., M.A., M.B. Camb.: house-physician.
- MACLEAN, W. E., M.D. St. And., M.R.C.P., D.C.H.: receivi physician.
- WALTHER, D. P., M.R.C.S., L.D.S. R.C.S.: orthodontic regi
- WESTHEAD, PAMELA, M.B. Brist.: resident anæsthetics re
- WETTENHALL, H. N. B., M.D., M.R.A.C.P., M.R.C.P.: physician.

Royal Isle of Wight County Hospital, Ryde:

- CLAY, R. D., B.SC., M.B. Lond.: morbid histologist.
- HARKNESS, JOHN, B.SC., M.B. Glasg.: biochemist.
- SWINSTEAD, P. D., M.B. Lond.: asst. pathologist.

Colonial Service:

- FARQUHARSON, A. D. J., M.R.C.S.: M.O., Nigeria.
- SWORD, J. M., M.B. Glasg.: M.O., Nyasaland.

Notes and News

WINDOW ON THE WALL

Orsett Hospital, Essex, the wards are gaily and subtly red, while a changing exhibition of lively pictures on the has hitherto gladdened the eye. Such unusual cheers derives from the taste and imagination of Dr. L. the superintendent, who has recently had a fresh idea ntertaining the old people who occupy his beds. The have now been decorated with two series of murals. ed by students of the South-East Essex Technical ge and School of Art, under the supervision of Mr. F. A. or, director of the department of arts of the college. The es were chosen by Dr. Cosin to remind elderly patients eir youth, and have been executed in tempera. One e two series shows active scenes in 19th-century life, ther scenes on the Thames from its source in the Cots- s down to the estuary at Tilbury.

. Adrian Hill, the author of *Art versus Illness*,[1] and pioneer t as a form of occupational therapy, opened an exhibition ese mural decorations at the hospital on July 9. He e of the drab or boring surroundings in which most term patients have to spend their days, and wished more doctors were obliged to try the experience. Most nts long for a window by their bed, though this is not ys possible. But what after all, he asked, is a good re but a window? A double window, he might have said. ing something of the thing seen and more of the artist saw it.

. Cosin has found that not only the patients but the are brightened by pleasant colours and good pictures on valls. Now, when it is specially necessary to make the of old buildings, he advocates the general use of colour: the first hospitals to be reborn in paint should be those he aged and chronic sick, for these patients may see no r surroundings for the rest of their days.

AUSTRALIAN NATIONAL UNIVERSITY

rof. Douglas Copland, D.SC., has been appointed vice- ncellor of the proposed National University of Australia, Canberra. The *Medical Journal of Australia* (July 10) orts Professor Copland as having expressed the hope that arch in medicine and physics would be organised there der the guidance of " Sir Howard Florey, F.R.S., and f. M. L. E. Oliphant, F.R.S.

FOR POSTGRADUATE VISITORS

HE Empire Medical Advisory Bureau established in don by the British Medical Association was opened July 13 by Lord Addison. Besides providing information at postgraduate instruction, the bureau will offer a onal advisory service; an accommodation register is to kept, and private hospitality will be arranged. The ctor is Dr. H. A. Sandiford.

EPSOM COLLEGE

'HIS term 511 boys, about 150 of them day-boys, have nded the college. The previous highest total was 480 1938. In its report, the council of the Royal Medical ndation records a loss of about £7000 in 1947; and next n the fees are to be raised to £215 per annum for a boarder . £90 for a day-boy, with a reduction of £10 for the son of loctor and £5 for the son of a dental surgeon. Fewer n 20 boys have been withdrawn as a result of this increase. report was unanimously approved at the annual meeting July 9 when Lord Leverhulme, who presided, said that view of the agreement, arising from the Fleming report, ake five boys a year from primary schools, it had become essary for the school to be inspected by the Ministry of ucation.

PECKHAM

ueen Mary, with the Prime Minister and other members he Cabinet, was present last week at the premiere in this ntry at the Odeon Theatre, Peckham, of a film, *The Centre*, cribing the work of the Peckham Health Centre. Originally ounced to take 45 minutes, it actually occupied less than f an hour, which gave the impression that it had been , especially as the salient information about the promotion he health of the people was not evident. The film presents good picture of the social life of the centre, which was emphasised by all the performers being drawn from the members.

The point made by Dr. Scott Williamson in his opening remarks, that the object of the work is to find what is right and healthy in life and not what is wrong and diseased, was not embodied in the film. Nor did it really show the contribution of the centre to family life; indeed the quarrel between Jones and his wife rather suggested that joining the health centre might cause domestic disharmony.

The film was made at the request of the Foreign Office and was shown at Lake Success to the World Health Organisation. Before it journeys further afield, Mr. Paul Rotha should introduce more evidence of the work which has been done at the centre and which is the basis of the establishment of the National Health Trust for research.

CARD-INDEX GUIDE TO THERAPY

A CARD-INDEX has one outstanding advantage over a textbook—that it can readily be kept up to date by replacing the cards. This form is therefore particularly suitable for a reference work on modern treatment, which is constantly changing. *The Practitioner's Card-Index Guide to Treatment*, published by Devereaux (Medical) Publications Ltd., of 36, Maiden Lane, W.C.2, contains the essentials of therapeutics arranged alphabetically on cards in a convenient plastic cabinet. The information is revised quarterly and the price of 5 guineas covers the first year's replacement cards.

DOCTORS' DISPENSERS

THE Ministry of Health announces that, under the Control of Engagements Order, doctors' dispensers whose employment has terminated following the introduction of the National Health Service will generally register for employment with the Ministry of Labour and National Service. Some of these dispensers have passed the examination of the Society of Apothecaries for assistants in dispensing; some have been trained in the R.A.M.C. or Royal Navy as sergeant compounder or sick-berth petty officer; and some have had long experience with doctors in retail pharmacy. They may be regarded, says the Ministry, as capable of dispensing medicines in both retail and hospital practice under the supervision of pharmacists; and those needing experienced assistants are advised to notify the local office of the Ministry of Labour.

University of Cambridge

A university health service is being introduced, and health service officers have been appointed. Arrangements are being made for a voluntary medical examination, including radiographic examination of the chest, of new students next term.

University of Manchester

The following have been successful in recent examinations:

D.P.M. (part 2).—C. L. Casimir, N. P. Chamarette, Alexander Clark, N. A. Cohen, Barbara M. Dick, J. H. Kahn, R. W. Lennon, M. M. Macrae, W. V. Wadsworth.

University of Edinburgh

The following degrees and diplomas were conferred on July 16:

M.D.—A. H. Banton,*† Agnes A. Brash,* Edward Christianson, A. S. Crawford, J. C. Gilroy,*† I. G. MacKenzie,† D. J. MacRae, Myre Sim, A. D. C. Young.

Ch.M.—J. C. Goligher.

Ph.D.—(*In the faculty of medicine*): N. K. Chowbury, C. C. James,* G. F. A. Rahim.

M.B., Ch.B.—D. W. Atkinson, Alison M. S. Bell, J. D. Bell, Jean Bowden, G. R. Brackenbridge, N. M. Bremner, A. A. Brown, Patricia M. M. Brown, Constance Bruce, J. G. Bulman, Helen L. Burns, Anne Cairns, W. C. Campbell, A. B. Carmichael, Kathleen M. Carmichael, A. B. Cassie, Maureen D. Connolly, Charlotte W. Cordin, J. K. Davidson, L. A. Davidson, Rosemary H. M. Davie,‡ William Davison, D. A. L. Dick, S. M. Drancz, James Drummond, R. B. Duthie, Bridget A. Evans, Mary C. Ewing, Elizabeth W. Ferguson, Sir James Fraser, D. L. Gardner, W. A. Gentle, A. H. C. Gieben, A. J. Gillies, J. F. Gould, W. D. Graham, G. A. Gray, J. D. Haldane, Joseph Hampson, J. W. Harkess, C. P. Hay, G. W. Hickish, Joan S. Hiscock, Fiona J. Holder, Jean C. Horwill, J. F. Houston, Elizabeth M. Ingles, R. H. B. Johnston, T. F. Keap, John Keenan, Jean H. Kendall, Gilbert Kennedy, A. W. S. Kerr, D. A. Lamont, Norman Laurie Smith, J. A. R. Lenman, S. J. A. Luckas, James Lugton, J. L. J. Lumey, E. I. Lunn, Anne P. McCaul, Janet N. McCulloch, I. K. McIntosh, Blanche M. MacIver, Mary L. Mackay, Hamish MacLean, T. W. McWhirter, Lorna D. Malloch, J. H. Marks, E. J. Meisels, M. W. Mills, J. H. Mitchell, Alastair Morrison, I. A. Morrison, Irene R. B. Muir, G. F. Murnaghan, J. G. M. Murray, Marjorie K. Murray, Isabella R. Napier, Elizabeth M. H. Neill, Elizabeth C. Nelson, T. B. M. Norman, I. M. Ogilvie, John Oliver, R. B. Ottley, Dorothy M. Pargeter, Lorraine M. Paterson, A. S. C. Peden, Lillias E. Penman, Ruth Porter, J. L. Potter, R. P. Powell, J. K. M. Quartey, H. A. J. Reay, J. L. Rennie, John Richmond, J. A. Riedel, D. H. H. Robertson, I. D. Robertson,

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[1] Allen & Unwin, 1946; see *Lancet* 1946, ii, 439.

WILLIAM AUSTIN ROBB

M.D. LOND., F.R.C.P.

Dr. W. A. Robb, pathologist to the Royal Devon and Exeter Hospital, died at his home on July 12, at the age of 55. Born at Burnt Fen, near Ely, he came of Suffolk yeoman stock and in youth hoped to become a veterinary surgeon. His passion for the country and for animals never left him; but by pure chance he took up pharmacy, and in this he showed such aptitude that he had taken the major pharmaceutical diploma by the age of 21. On the outbreak of the 1914–18 war he enlisted at once in the R.A.M.C., and in France he was sergeant-dispenser in the 36th Field Ambulance, in which his name became a byword for efficiency. The *Pharmaceutical Journal* of July 26, 1919, contained the following comment which bears this out: "I would like to compliment the man in charge of the dispensary of the 36th F.A. Had you seen his pharmacy under indescribable conditions you would have wondered how he did it. His officers used to marvel at him and were never tired of singing his praises."

In the German break-through of 1916 Robb was seriously wounded and taken prisoner while superintending the evacuation of casualties. On recovering in a German hospital, his work and care of patients of all kinds (German and otherwise) became so valuable that his captors pressed him to stay instead of going to a prisoner-of-war camp. Robb refused, in order to throw in his lot with his fellows, to whose service he devoted himself wholeheartedly. His war experience caused him to take up medicine, and in 1919, directly on demobilisation, he went to Barts from which he qualified in 1924, taking both the M.R.C.P. and M.D. in 1926. He became devoted to Langdon-Brown, to whom he was house-physician and chief assistant—a post he held until he could resist no longer the call of the country. He thus was led to Exeter in 1931, where he remained as pathologist until his premature death.

With his pharmaceutical background, it was natural that his experience was used, first as a teacher of practical pharmacology at Barts and later as a member of the revision committee of the *British Pharmacopœial Codex*. During the late war he added to his many appointments that of regional resuscitation officer in the E.M.S.

Such are the bare facts in the life of a character of great friendliness who will be sadly missed in the South-West. Austin Robb was of an all too rare type; thoroughly consistent to the root traditions in which he was bred. He was passionately fond of the country, and there were few parts of Devon of which he did not have an intimate knowledge gained from prodigious journeys on foot; he was able to surprise many medical colleagues by his knowledge of where their patients lived. His fondness for animals even led him to allow his chickens to wander through the flower garden "because it pleased them"! He was a loyal son of Barts and his home was a constant place of pilgrimage for his older and contemporary colleagues. He was a man of deep religious feelings without making it obvious; as a student these were coloured by his experience of life of a grimmer sort, and were more real than the adolescent gropings of the younger men who were his fellows. In later life he was a constant supporter of his church, and at the same time enjoyed life to the full. He lived well, he read prodigiously, he was a connoisseur of art, and he had a wonderful sense of humour.

In medicine his greatest achievement was of the unspectacular type, as a clinical pathologist. He was no pure laboratory man, though he established a first-rate pathological service. Technically he strove hard for perfection; he would not compromise with inefficiency or humbug. He made pathology what it should be—the basis of good clinical practice. In his office medical men came to discuss their pathological problems and went away enriched not only with the light of technical investigation but with a wealth of clinical sense; indeed with the illumination of a great physician.

As one who knew him as a friend and colleague, I would like to add one further note from the patient's viewpoint. Illness to Austin Robb was a personal problem not confined to physical signs and laboratory tests. As a patient one felt the whole impa his character: it was a chastening and invi experience.

He leaves a wife and two children.

THE LATE CAPTAIN WATSON

A tribute to Captain Edward Clifford W R.N. retd., who died last August, reaches us J. B. G. S. who served with him in the late war. taking up medicine Watson had already had tinguished career in the Royal Navy: in the first war he was an Admiralty consultant in radio pro After twenty years' service he retired with the r commander, and he was later promoted captain o retired list. In 1930 he qualified as M.R.C.S. St. Mary's Hospital, London, where he held the pos resident obstetrical officer before going into practi Twickenham. On the outbreak of the late wa returned to the sea, and he served afloat throughout war, mostly in command of minelayers. "Alth so long out of touch with Naval affairs, he had forgot none of his seamanship and navigation; and he awarded the D.S.O. for services in minelaying while command of H.M.S. *Twistbank*. As medical office *Twistbank* for two years, I had reason to be grateful his helpfulness. He was a man of strong persona good judgment, and considerable charm; his w knowledge of general affairs was supported by de reading, and when we were in harbour he taught him foreign languages. His last days were spent as heal adviser to the government of Trinidad."

Medicine and the Law

Similar Containers Again

At a Birmingham inquest earlier this month t house-surgeon of a maternity hospital admitted th the death of a month-old infant was due to his mis in taking fluid from the wrong container for washing vein after a transfusion. He had used meth other instead of a saline solution. The deputy c recalled that a similar fatal mistake had been ma the same city at another hospital two years ago. press had reported this previous incident in 194 local hospital managers must have discussed it; the lesson of the tragic error had not been applied hoped that hospitals would take all possible ste prevent a further repetition. In particular he menti the recommendation put forward by one witness in that containers of different colour should be used. T suggestion, he thought, would not only avert t tragedies but would also ease the surgeon's task giving him less to concentrate upon in the course of t actual operation.

Appointments

BODDANO, AGNES, M.B. Manc.: pathologist, Keighley and Di Victoria Hospital, Yorks.
DAVIDSON, W., M.B., D.M.R.D.: asst. radiologist, Royal I Infirmary.
JOHNSTON, E. A., M.A., M.B. Aberd., D.P.H.: chief M.O.H., Inv shire.
McWILLIAMS, L. F., M.C., M.B. Belf., D.P.H.: asst. M.O. and Hucknall, Notts.
PHILPS, A. S., F.R.C.S.: surgeon i.c. eye department, St. B mew's Hospital, London.
WALKER, J. V., M.D. Birm., M.R.C.P., D.P.H.: M.O.H., Darli

Hospital for Sick Children, Great Ormond St.:

- COLE, PAULINE, M.B. Lond.: house-surgeon.
- DUDGEON, J. A., M.C., M.A., M.D. Camb.: asst. pathologist
- GORDON, W., M.B.: house-surgeon.
- JOLLY, H. R., M.A., M.B. Camb.: house-physician.
- MACLEAN, W. E., M.D. St. And., M.R.C.P., D.C.H.: reside physician.
- WALTHER, D. P., M.R.C.S., L.D.S. R.C.S.: orthodontic re
- WESTHEAD, PAMELA, M.B. Brist.: resident anaesthetic
- WETTENHALL, H. N. B., M.D., M.R.A.C.P., M.R.C.P.: physician.

Royal Isle of Wight County Hospital, Ryde:

- CLAY, R. D., B.SC., M.B. Lond.: morbid histologist.
- HARKNESS, JOHN, B.SC., M.B. Glasg.: biochemist.
- SWINSTEAD, P. D., M.B. Lond.: asst. pathologist.

Colonial Service:

- FARQUHARSON, A. D. J., M.R.C.S.: M.O., Nigeria.
- SWORD, J. M., M.B. Glasg.: M.O., Nyasaland.

LATENT TETANY CAUSED BY BAL
2:3 DIMERCAPTOPROPANOL

BRIAN RUSSELL
M.D. Lond., M.R.C.P., D.P.H.
ASSISTANT PHYSICIAN

BERNARD GREEN
M.R.C.S.
CHIEF ASSISTANT,

L. G. R. WAND
M.A., M.B. Camb.
HOUSE PHYSICIAN,

IN DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL,
LONDON

IE BAL Conference of the Medical Research Council 7) said that BAL is efficacious as an antidote to aicals, forming relatively stable ring compounds . arsenoxides, and thus promoting increased urinary etion of arsenic. It has been used successfully against xication by mercury (Longcope and Luetscher 5) and gold (Ragan and Boots 1947), and is said to roy the complexes formed between these metals and r proteins. In animal experiments it has been found ıbstract nickel, cadmium, chromium, bismuth, and mony, and it may be capable of withdrawing other als, including lead. In a patient with chronic lead oning Telfer (1947) noted a rise of over 100% in ary lead excretion after twelve injections in three s of 1·9 mg. of BAL per kg. of body-weight. These s make it likely that BAL can also withdraw certain ntial kations from the serum and tissues, for it would strange if all body metals were immune from its ience.

he occurrence of cramp-like pains in the limbs, and sms of the fingers, in a patient undergoing treatment h BAL suggested to us that a state of latent tetany ght be present, and the detection of Chvostek's sign both sides confirmed this suspicion. The absence of alosis made it probable that the tetany was of low-cium or low-magnesium type; so we studied the assium, sodium, calcium, magnesium, and inorganic-osphate levels in the serum in this and other patients and unteer students after intramuscular injections of BAL.

TOXICITY OF BAL

imals

Durlacher et al. (1946) state that the convulsions owing BAL are not due to hypoglycæmia. Toxic es produce a metabolic acidosis, shown by a diminished and CO_2 content and increased amounts of serum-tic acid and amino nitrogen. The blood-sugar level s initially but falls to hypoglycæmic levels before ıth. The glycogen content of the liver is reduced, and potassium content of the liver is decreased with rease of the sodium and chloride contents.

Modell, Chenoweth, and Krop (1946) give evidence icating that the high blood lactic-acid level does not ise the symptoms, and that the eye signs and salivation produced by BAL in the circulation and not by that the expired air or in the tears. The signs of salivation l lacrimation also depend on an intact parasympa-tic innervation. A dose of about $^1/_3$ L.D.50 had no ect on the prothrombin-time. Post mortem the only equivocal effects noted were œdema and petechial morrhages in the lungs.

Chenoweth (1946) noted a rise in blood-pressure after all doses of BAL but a fall in systemic and pulmonary erial pressures after larger doses, with a fall in venous ssure except the portal pressure, which was raised. concludes that BAL has a primary constricting ion, but that capillary damage from larger doses ds to increased permeability and signs of peripheral cular failure. A pronounced increase was noted in the e of lymph-flow from the thoracic and cervical ducts. Krop (1946) found a considerable accumulation of tate in the liquid surrounding a stimulated frog's sartorius muscle in the presence of BAL. The initial heat and "twitch tension" were at first increased and later reduced, without significant change in "efficiency."

Man

Sulzberger et al. (1946) studied the toxic effects of BAL injected intramuscularly into 34 healthy young adult males without arsenical or other intoxications. Symptoms were noted 10–30 minutes after the injection of doses equivalent to 3·5–5·5 mg. of BAL per kg. of body-weight daily. No cumulative effects were observed with four doses of about 5 mg. per kg. of body-weight at four-hour intervals, but they were noted when there was only a two-hour interval between the first two injections.

In 11 of the volunteers reducing substances were found in the urine, but other urinary findings were normal. There was no evidence of reduction of the CO_2-combining power of the plasma. Icteric indices were all normal. Respiration-rates increased slightly in 15–20 minutes up to a maximum of 26 per minute. There were significant elevations of the blood-pressure in 30–40 minutes in 14 of 17 volunteers.

In this country the therapeutic dose used has been only about 1·5 mg. per kg. of body-weight (BAL Conference of M.R.C., 1947).

Modell, Gold, and Cattell (1946) studied the effects of BAL on 8 women and 1 man, aged 18–49 years, with secondary or tertiary syphilis. The minimum dose which produced toxic effects was 3–5 mg. per kg. of body-weight. After a single dose of 8 mg. per kg. the symptoms were most severe 5–30 minutes after the injection, increasing gradually in intensity until a level was reached which lasted about 40 minutes, and then subsiding gradually but persisting for between 15 minutes and 2 hours. The blood-pressure and other changes were reversible.

The symptoms of intoxication from BAL as described by these authors, in their exact terms, are compared with the symptoms of latent tetany as described by Strümpell and Seyfarth (1931), with additions from Poulton et al. (1930) as follows:

Toxic symptoms from BAL	*Symptoms of tetany*
Nausea, vomiting	Hypersecretion of gastric juice
Headache	
Burning sensations of the lips, mouth, and throat	Hyperexcitability of the auditory and gustatory nerves
Constricted feelings and pains in the chest	Contractions of the diaphragm
Constricted feelings and pains in the hands, and muscle spasm of the leg	Carpopedal spasm
Conjunctivitis, "tearing," blepharospasm, and burning sensations of the eyes	Recurring conjunctivitis
Rhinorrhœa and burning or tingling of the nose	
Salivation and pains in the jaws	Salivation
Tingling of the hands, pains in the limbs, burning and tingling of the extremities and of the skin, and burning sensation of penis	Paræsthesiæ and pains
Sweating of forehead, hands, &c., and sense of warmth	Hypersecretion of sweat
Moderate to very severe abdominal pain	Painful spasms of diaphragmatic or other muscles of the abdomen, chest, or back
Tremor, general agitation, unrest	Tremors, convulsions in children
Weakness, fatigue	Muscular weakness
Uncontrollable laughter	Occasional hallucinations
Heart-rate moderately accelerated	Pulse increased
Significant rise of systolic and diastolic blood-pressure $^1/_2$ hour after injection, persisting for 15–90 minutes	Increased cardiac activity and vascular spasm

Joan E. Rowlands, I. J. B. Russell, A. M. Ruxton, Joycelyn H. W. Sandison, D. B. Scott, C. J. Sikkel, F. F. Silk, Esme J. Simpson, Beryl E. Sinclair, Evelyn A. C. Skinner,‡ J. B. Smith, Margaret C. Smith, Elizabeth L. T. Stoddart, J. F. Stone, Geoffrey Stout, Jean M. Thoburn, A. W. H. Thomson, Ethel M. Wallis, A. T. Watson, I. H. Watson, A. A. Wild, Jean A. R. Wilkie, M. H. Wong, Elizabeth J. A. Yool.

The Ettles scholarship and Leslie medal for the most distinguished graduate of the year were awarded to Rosemary H. M. Davie.

D.P.H.—W. J. Bell, J. D. Crombie, J. A. Eadie, William Edgar,* H. J. Gibson, George Graham-Cumming, Minnie K. Herring, D. J. M. Mackenzie,* H. B. Martin, George Masterton,* G. O. Mayne, H. C. Milligan, E. H. Murcott,* S. M. Musgrave, Kandukur Prabhakar,* S. N. P. Stobie, Agnes W. C. Storrar,* W. F. J. M. Thom, J. E. Tinne, Elizabeth Whalley.

D.T.M. & H.—Emmanuel Evans-Anfom, E. A. Frayworth, P. K. Mathur, Jagat Ram, Jean A. Robertson,* A. C. B. Singleton, T. B. M. Sloan, G. P. Stilley,* H. C. W. Stringer.

D.M.R.D.—William Cockburn, Jack Cowen, C. P. M. Feltham, J. D. Recordon.

D.I.H.—H. O. Engel,* H. A. Forrester,* A. B. Guild,* A. S. McLean, R. C. Mahanty, K. K. Mathur, H. D. Paviere,* D. G. Waddell,* H. D. Wilson.*

M.B., Ch.B. of the Polish School of Medicine.—Albert Adamczyk,* Petronela L. Buckiewicz, Maria A. Chrzaszcz, Jerzy Cyrkowicz, H. W. Hamerski,* Mieczyslaw Kawa,* Zenon Kocay, Jaroslaw Kolcan,* Danuta Manitius, Stanislaw Monka,* Wladyslaw Olesinski,* Oskar Slowik, Zbigniew Sobol,* Herbert Stanisrewski, Zbigniew Szarnagiel, Jadwiga Szlaskowska, Maria Szyndler, Irena Waga, Zofia Wesierska.*

* In absentia. † Commended. ‡ With honours.

University of Glasgow

Dr. A. Stewart Henderson has been appointed medical officer in charge of the university student health scheme.

A lectureship has been created in tribute to the memory of the late Dr. Noah Morris, professor of materia medica.

Royal College of Surgeons of England

Lister medal.—This medal, which is awarded in recognition of distinguished contributions to surgical science, has been granted this year to Mr. Geoffrey Jefferson, F.R.S., professor of neurosurgery in the University of Manchester, in recognition of his contributions to "knowledge of the functions and structure of the nervous system, made as a philosophical biologist, practising neurosurgery." Professor Jefferson will deliver the Lister memorial lecture in London next June, under the auspices of the college.

This is the ninth occasion of the award, which is made by a committee representative of the Royal Society, the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the University of Edinburgh, and the University of Glasgow.

Royal College of Physicians of Edinburgh

A Kirk Duncanson fellowship for medical research has been awarded to Dr. R. M. Marquis, who will investigate congenital malformations of the heart.

Royal College of Physicians of Ireland

On July 9 T. S. W. Buss was admitted a member of the college.

Charing Cross Hospital

Dr. Doyne Bell will give a lecture entitled Points from the Swedish Pædiatric Congress, 1948, in the clinical lecture theatre of this hospital on Wednesday July 28, at 5 P.M.

International Union Against Venereal Diseases

The general assembly of this organisation is to be held this year in Copenhagen from Sept. 6 to 10.

United Cambridge Hospitals

Under an order issued by the Minister of Health, Chesterton Hospital, Cambridge, formerly a poor-law institution, has been transferred from the control of the East Anglian regional hospital board to the board of governors of the teaching hospital.

Medical Society of the L.C.C. Service

At a meeting on July 7 it was decided to change the name of this society to the London County Medical Society. It is intended that the society shall continue to hold monthly meetings, most of which will be clinical; and membership will in future be open to any doctor who wishes to join. Further particulars may be obtained from the secretary, Mr. I. Matheson, F.R.C.S., St. Giles Hospital, S.E.5.

Sir Max Page has been appointed officer of the Legion of Honour of France.

Prof. Alan Moncrieff, director of the Institute of Child Health at the Hospital for Sick Children, Great Ormond Street, has been elected an honorary fellow of the American Academy of Pediatrics.

Diary of the Week

JULY 25 TO 31

Monday, 26th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. H. A. Harris: Clinical Anatomy of Thorax.
6.15 P.M. Mr. A. Bulloid: Bacteriology of the Mouth.

Tuesday, 27th

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. D. T. Harris: Autonomic Nervous System.
6.15 P.M. Dr. A. C. Counsell: Etiology of Cysts of the Mouth
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
3.30 P.M. (Anatomy lecture theatre, University of Edinbur Prof. J. H. Gaddum, F.R.S.: Adrenaline and All Substances.

Wednesday, 28th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. M. W. Carr, D.D.S. (New York): Acute Infectio of the Face and Neck of Dental Origin. (Charles Tom lecture.)
INSTITUTE OF LARYNGOLOGY, 330, Gray's Inn Road, W.C.1
4.30 P.M. Mr. V. E. Negus: Organic Nervous Affections of th Larynx.

Thursday, 29th

ROYAL COLLEGE OF SURGEONS
5 P.M. *Prof. Shafik Shalaby (Cairo): Amœbic Liver Absc* (Hunterian lecture.)
5 P.M. Dr. W. A. M. Smart: Circulation.
6.15 P.M. Prof. G. P. Wright: Repair of Connective Tissues.

Friday, 30th

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. C. Reid: Respiration and Anoxæmia.
6.15 P.M. Prof. R. Hare: Source and Transmission of Wound Infection.
EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
3.30 P.M. Mr. R. C. Brock: Segmental Anatomy of the Lungs.

Births, Marriages, and Deaths

BIRTHS

APPLEBY.—On July 13, at Sheffield, the wife of Captain T Appleby, R.A.M.C.—a son.

COLVER.—On July 15, at Sheffield, the wife of Dr. Thomas Co —a son.

CROCKETT.—On July 9, in London, the wife of Dr. Gerard Cr —a son.

D'ABREU.—On July 10, in Birmingham, the wife of Mr A. L. d'Abreu, O.B.E., F.R.C.S.—a daughter.

FORSTER.—On July 16, at Barnstaple, the wife of Dr. W. M. Fo —a son.

IMRIE.—On July 12, at Guildford, the wife of Dr. D. A. Imrie, M.D.—a daughter.

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LOVELOCK.—On July 12, in New York, the wife of Dr. J. E. Lovelock—a daughter.

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SMITH.—On July 16, in London, the wife of Dr. W. H. R. Smith—a son.

STANLEY.—On July 15, in London, the wife of Mr. B. E. Craw Stanley, F.R.C.S.—a daughter.

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ENZER—DEACON.—On July 8, in London, John Enzer, to Margaret Deacon.

KELSEY—SHACKLETON.—On July 12, at Askrigg, Francis Kelsey, B.M., to Rachel Fell Shackleton, B.M.

ROSE—RANKIN.—On July 10, at Perth, Ian Falconer Rose, F.R.C.S., to Christian Rankin.

VOWLES—KNOWLES.—On July 17, at Bideford, Keith John Vowles, M.B., to Mary Knowles, M.B.

DEATHS

FRYER.—On July 14, at Pinner, James Fryer, M.B. Glasg.,

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LOUGHNANE.—On July 14, in London, Farquhar McGill Loughnane, F.R.C.S.

LOW.—On July 10, at Tring, Alfred Lees Low, M.B. Edin.

McCAY.—On July 13, at Woking, David McCay, M.D. Belf., lieut.-colonel, I.M.S. retd., aged 75.

O'CONNOR.—On July 12, in Johannesburg, John O'Connor,

SNELLING.—On July 17, at Luton, Trevor Richard Snelling, aged 58.

SYKES.—On July 14, at Bath, John Lewis Sykes, M.R.C.S.

LATENT TETANY CAUSED BY BAL

2:3 DIMERCAPTOPROPANOL

BRIAN RUSSELL
M.D. Lond., M.R.C.P., D.P.H.
ASSISTANT PHYSICIAN

BERNARD GREEN
M.R.C.S.
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L. G. R. WAND
M.A., M.B. Camb.
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KIN DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL,
LONDON

THE BAL Conference of the Medical Research Council 47) said that BAL is efficacious as an antidote to enicals, forming relatively stable ring compounds h arsenoxides, and thus promoting increased urinary retion of arsenic. It has been used successfully against oxication by mercury (Longcope and Luetscher 46) and gold (Ragan and Boots 1947), and is said to stroy the complexes formed between these metals and dy proteins. In animal experiments it has been found abstract nickel, cadmium, chromium, bismuth, and timony, and it may be capable of withdrawing other etals, including lead. In a patient with chronic lead isoning Telfer (1947) noted a rise of over 100% in inary lead excretion after twelve injections in three ys of 1·9 mg. of BAL per kg. of body-weight. These cts make it likely that BAL can also withdraw certain sential kations from the serum and tissues, for it would strange if all body metals were immune from its fluence.

The occurrence of cramp-like pains in the limbs, and asms of the fingers, in a patient undergoing treatment ith BAL suggested to us that a state of latent tetany ight be present, and the detection of Chvostek's sign n both sides confirmed this suspicion. The absence of lkalosis made it probable that the tetany was of low-alcium or low-magnesium type; so we studied the otassium, sodium, calcium, magnesium, and inorganic-hosphate levels in the serum in this and other patients and olunteer students after intramuscular injections of BAL.

TOXICITY OF BAL

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Durlacher et al. (1946) state that the convulsions ollowing BAL are not due to hypoglycæmia. Toxic loses produce a metabolic acidosis, shown by a diminished H and CO_2 content and increased amounts of serum-actic acid and amino nitrogen. The blood-sugar level ises initially but falls to hypoglycæmic levels before leath. The glycogen content of the liver is reduced, and he potassium content of the liver is decreased with ncrease of the sodium and chloride contents.

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In 11 of the volunteers reducing substances were found in the urine, but other urinary findings were normal. There was no evidence of reduction of the CO_2-combining power of the plasma. Icteric indices were all normal. Respiration-rates increased slightly in 15–20 minutes up to a maximum of 26 per minute. There were significant elevations of the blood-pressure in 30–40 minutes in 14 of 17 volunteers.

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The symptoms of intoxication from BAL as described by these authors, in their exact terms, are compared with the symptoms of latent tetany as described by Strümpell and Seyfarth (1931), with additions from Poulton et al. (1930) as follows:

Toxic symptoms from BAL	*Symptoms of tetany*
Nausea, vomiting	Hypersecretion of gastric juice
Headache	
Burning sensations of the lips, mouth, and throat	Hyperexcitability of the auditory and gustatory nerves
Constricted feelings and pains in the chest	Contractions of the diaphragm
Constricted feelings and pains in the hands, and muscle spasm of the leg	Carpopedal spasm
Conjunctivitis, "tearing," blepharospasm, and burning sensations of the eyes	Recurring conjunctivitis
Rhinorrhœa and burning or tingling of the nose	
Salivation and pains in the jaws	Salivation
Tingling of the hands, pains in the limbs, burning and tingling of the extremities and of the skin, and burning sensation of penis	Paræsthesiæ and pains
Sweating of forehead, hands, &c., and sense of warmth	Hypersecretion of sweat
Moderate to very severe abdominal pain	Painful spasms of diaphragmatic or other muscles of the abdomen, chest, or back
Tremor, general agitation, unrest	Tremors, convulsions in children
Weakness, fatigue	Muscular weakness
Uncontrollable laughter	Occasional hallucinations
Heart-rate moderately accelerated	Pulse increased
Significant rise of systolic and diastolic blood-pressure $^1/_2$ hour after injection, persisting for 15–90 minutes	Increased cardiac activity and vascular spasm

Joan E. Rowlands, I. J. B. Russell, A. M. Ruxton, Joycelyn H. W. Sandison, D. B. Scott, C. J. Sikkel, F. F. Silk, Esme J. Simpson, Beryl E. Sinclair, Evelyn A. C. Skinner,‡ J. B. Smith, Margaret C. Smith, Elizabeth L. T. Stoddart, J. F. Stone, Geoffrey Stout, Jean M. Thoburn, A. W. H. Thomson, Ethel M. Wallis, A. T. Watson, I. H. Watson, A. A. Wild, Jean A. R. Wilkie, M. H. Wong, Elizabeth J. A. Yool.

The Ettles scholarship and Leslie medal for the most distinguished graduate of the year were awarded to Rosemary H. M. Davie.

D.P.H.—W. J. Bell, J. D. Crombie, J. A. Eadie, William Edgar,* H. J. Gibson, George Graham-Cumming, Minnie K. Herring, D. J. M. Mackenzie,* H. B. Martin, George Masterton,* G. O. Mayne, H. C. Milligan, E. H. Murcott,* S. M. Musgrave, Kandukur Prabhakar,* S. N. P. Stobie, Agnes W. C. Storrar,* W. F. J. M. Thom, J. E. Tinne, Elizabeth Whalley.

D.T.M. & H.—Emmanuel Evans-Anfom, E. A. Frayworth, P. K. Mathur, Jagat Ram, Jean A. Robertson,* A. C. B. Singleton, T. B. M. Sloan, G. P. Stilley,* H. C. W. Stringer.

D.M.R.D.—William Cockburn, Jack Cowen, C. P. M. Feltham, J. D. Recordon.

D.I.H.—H. O. Engel,* H. A. Forrester,* A. B. Guild,* A. S. McLean, R. C. Mahanty, K. K. Mathur, H. D. Paviere,* D. G. Waddell,* H. D. Wilson.*

M.B., Ch.B. of the Polish School of Medicine.—Albert Adamczyk,* Petronela L. Buckiewicz, Maria A. Chrzaszcz, Jerzy Cyrkowicz, H. W. Hamerski,* Mieczyslaw Kawa,* Zenon Kocay, Jaroslaw Kolcan,* Danuta Manitius, Stanislaw Monka,* Wladyslaw Olesinski,* Oskar Slowik, Zbigniew Sobol,* Herbert Staniszewski, Zbigniew Szarnagiel, Jadwiga Szlaskowska, Maria Szyndler, Irena Waga, Zofia Wesierska.*

* In absentia. † Commended. ‡ With honours.

University of Glasgow

Dr. A. Stewart Henderson has been appointed medical officer in charge of the university student health scheme.

A lectureship has been created in tribute to the memory of the late Dr. Noah Morris, professor of materia medica.

Royal College of Surgeons of England

Lister medal.—This medal, which is awarded in recognition of distinguished contributions to surgical science, has been granted this year to Mr. Geoffrey Jefferson, F.R.S., professor of neurosurgery in the University of Manchester, in recognition of his contributions to "knowledge of the functions and structure of the nervous system, made as a philosophical biologist, practising neurosurgery." Professor Jefferson will deliver the Lister memorial lecture in London next June, under the auspices of the college.

This is the ninth occasion of the award, which is made by a committee representative of the Royal Society, the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the University of Edinburgh, and the University of Glasgow.

Royal College of Physicians of Edinburgh

A Kirk Duncanson fellowship for medical research has been awarded to Dr. R. M. Marquis, who will investigate congenital malformations of the heart.

Royal College of Physicians of Ireland

On July 9 T. S. W. Buss was admitted a member of the college.

Charing Cross Hospital

Dr. Doyne Bell will give a lecture entitled Points from the Swedish Pædiatric Congress, 1948, in the clinical lecture theatre of this hospital on Wednesday July 28, at 5 P.M.

International Union Against Venereal Diseases

The general assembly of this organisation is to be held this year in Copenhagen from Sept. 6 to 10.

United Cambridge Hospitals

Under an order issued by the Minister of Health, Chesterton Hospital, Cambridge, formerly a poor-law institution, has been transferred from the control of the East Anglian regional hospital board to the board of governors of the teaching hospital.

Medical Society of the L.C.C. Service

At a meeting on July 7 it was decided to change the name of this society to the London County Medical Society. It is intended that the society shall continue to hold monthly meetings, most of which will be clinical; and membership will in future be open to any doctor who wishes to join. Further particulars may be obtained from the secretary, Mr. I. Matheson, F.R.C.S., St. Giles Hospital, S.E.5.

Sir Max Page has been appointed officer of the Legion of Honour of France.

Prof. Alan Moncrieff, director of the Institute of Child Health at the Hospital for Sick Children, Great Ormond Street, has been elected an honorary fellow of the American Academy of Pediatrics.

Diary of the Week

JULY 25 TO 31

Monday, 26th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. H. A. Harris: Clinical Anatomy of Thorax.
6.15 P.M. Mr. A. Bulleid: Bacteriology of the Mouth.

Tuesday, 27th

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. D. T. Harris: Autonomic Nervous System.
6.15 P.M. Dr. A. C. Counsell: Etiology of Cysts of the Mouth.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
3.30 P.M. (Anatomy lecture theatre, University of Edinbu
Prof. J. H. Gaddum, F.R.S.: Adrenaline and Al
Substances.

Wednesday, 28th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. M. W. Carr, D.D.S. (New York): Acute Infecti
of the Face and Neck of Dental Origin. (Charles Tom
lecture.)

INSTITUTE OF LARYNGOLOGY, 330, Gray's Inn Road, W.C.1
4.30 P.M. Mr. V. E. Negus: Organic Nervous Affections of th
Larynx.

Thursday, 29th

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. Shafik Shalaby (Cairo): Amœbic Liver Abs
(Hunterian lecture.)
5 P.M. Dr. W. A. M. Smart: Circulation.
6.15 P.M. Prof. G. P. Wright: Repair of Connective Tissues.

Friday, 30th

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LATENT TETANY CAUSED BY BAL

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Rhinorrhœa and burning or tingling of the nose	
Salivation and pains in the jaws	Salivation
Tingling of the hands, pains in the limbs, burning and tingling of the extremities and of the skin, and burning sensation of penis	Paræsthesiæ and pains
Sweating of forehead, hands, &c., and sense of warmth	Hypersecretion of sweat
Moderate to very severe abdominal pain	Painful spasms of diaphragmatic or other muscles of the abdomen, chest, or back
Tremor, general agitation, unrest	Tremors, convulsions in children
Weakness, fatigue	Muscular weakness
Uncontrollable laughter	Occasional hallucinations
Heart-rate moderately accelerated	Pulse increased
Significant rise of systolic and diastolic blood-pressure $^1/_2$ hour after injection, persisting for 15–90 minutes	Increased cardiac activity and vascular spasm

These symptoms and signs, in both conditions, may be summarised as manifestations of increased excitability of motor, sensory, and secretory nerves, the vegetative nervous system, and the higher centres.

CAUSES OF TETANY

The maintenance in the pericellular fluid of equilibrium between calcium, magnesium, and hydrogen ions on the one hand, and sodium, potassium, and hydroxyl ions on the other, is vital for the health of the cells controlling the heart-beat, the contractility of plain and striped muscle, and the transference of impulses at the neuro-muscular junctions and through synapses. Tetany is produced by increased nervous irritability resulting from a fall in calcium, magnesium, or hydrogen-ion concentration or a rise in that of sodium, potassium, or hydroxyl. Reverse changes lessen nervous irritability and alleviate tetany.

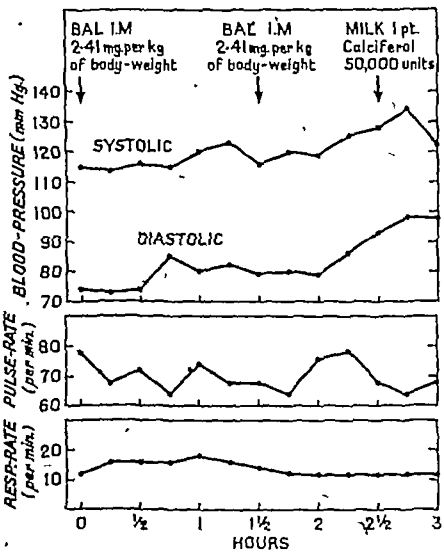

Fig. 1—Blood-pressure and respiration-rate after injection of BAL.

The more common known causes of tetany are (1) alkalosis, particularly from vomiting, excessive alkali ingestion, or hyperventilation, and (2) states of calcium insufficiency. In cattle, a deficiency of magnesium may also produce tetany ("grass tetany"), and Miller (1944) described a boy aged $3^1/_2$ years with osteochondritis who had had tetany since the age of 7 months but whose serum-calcium level was repeatedly within normal limits. The serum-magnesium content was 1·7 mg. per 100 ml., the low limit of normal. Magnesium sulphate grains 5 t.d.s. by mouth relieved the tetany, but there was a relapse on its withdrawal, with Chvostek's and Trousseau's signs present and a serum-magnesium level of 0·6 mg. per 100 ml.

ACTION OF BAL ON MAGNESIUM

In the extensive literature on BAL no reports have been found of any effect on calcium, but Webb and van Heyningen (1947), trying to explain its toxicity, noted its action on many enzymes in vitro and concluded that BAL probably acts as an antagonist of metal activation of enzymes, even interfering with the activation of enzymes activated by Mg^{++} enzymes—e.g., hexokinase. This effect was immediately reversed by the addition of excess Mg^{++}. They thought it an open question whether the toxicity of BAL is due to this inhibition of metal-containing enzymes, and noted further that, though BAL forms stable insoluble compounds with copper and iron, none are formed with Zn^{++} or Mg^{++} at neutral pH.

Barron et al. (1947) state that BAL combines with magnesium to form colourless soluble compounds, which may explain the inhibitory effect of magnesium chloride on the rate of oxidation of 'Dithiol,' noted to be 44% with 0·01 M.$MgCl_2$.

Calcium also forms no insoluble compounds with BAL in vitro.

CASE-RECORD

Our patient was a man aged 57, who had rheumatoid arthritis for twenty months.

He had received nine injections of 'Myocrysin' at intervals, starting about May 1, 1947. The clefts of fingers began to itch after the seventh injection, and a spread rash developed about a week after the last inj In mid-July he had received eight injections of thiosulphate on alternate days, with some relief of the it and of the rash, but these soon relapsed more extensi than before.

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Blood-count: red cells 4,570,000 per c.mm., Hb 8 (11·6 g. per 100 ml.), colour-index 0·9, white cells 9000 p c.mm. (polymorphs 80%, lymphocytes 15%, monocytes 1 eosinophils 3%, basophils 1%).

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CLINICAL STUDY

Fifteen days after the last injection of BAL this patient attended again for serum-calcium and other studies before and after injections of BAL.

The test began at 2 P.M. and was preceded by a normal luncheon of meat and vegetables, boiled celery, stewed apples, and macaroni. This was considered unlikely to have any

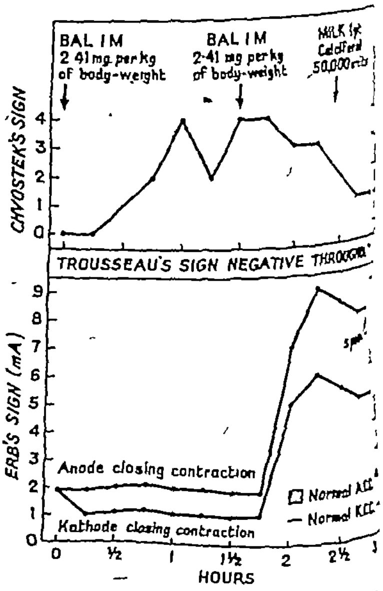
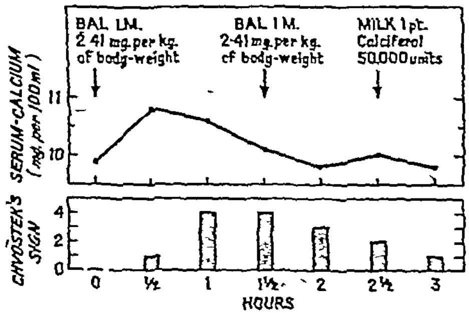


Fig. 2—Nervous signs after injection of BAL. 1, positive unilateral; 2, positive bilateral; 3, strongly positive on one side, positive the other; 4, strongly positive bilateral.

ant effect on the serum-calcium level, since man s calcium principally from milk, cheese, butter, green vegetables, and nuts (Hunter 1931). um salts, whether soluble or insoluble, given by h, appear to be absorbed only with difficulty, and alcium in food is probably entirely converted by tion into the inorganic form and absorbed as um salts, partly or completely ionised.

. 1 shows that the systolic blood-pressure rose 9 mm. Hg and the diastolic blood-pressure by m. Hg after *two injections* of BAL each of 150 mg. /₂ hours' interval. Three blood-pressure readings were n on each occasion and the mean recorded. In the hour of study increasing difficulty was found in the mination of the diastolic pressure after the first of three readings, unless an interval was allowed before ng to record another reading. This difficulty was ght to be due to arterial spasm, particularly since m was also noted in voluntary muscle from vanism at 3 hours. Variations in pulse-rate and piration-rate were not significant.



3—Serum-calcium level and Chvostek's sign after injection of BAL : same notation for Chvostek's sign as in fig. 2.

Chvostek's sign (fig. 2) became positive half an hour er the first injection and remained positive throughout remainder of the test. Trousseau's sign was negative oughout.

With galvanism, the kathode closing contraction and anode closing contraction were within normal limits 1³/₄ hours, but at 2 hours (half an hour after the second ection) rose sharply to a maximum of 6 mA and 9 mA pectively, and afterwards tended to fall slowly but re still 5 mA and 8 mA respectively at the end of the riod of study, with spasm reported in the anode sing contraction at 3 hours. These changes are the posites of those to be expected with tetany, but they e evidence of a profound disturbance in kationic uilibrium, and may be related to the accumulation lactic acid in the muscles, noted in animal studies by op (1946).

In a study of this kind a single estimation of the um-calcium and serum-magnesium levels is of relaely little value, and only indirect evidence of fluctuans in the tissue calcium and magnesium content be obtained by a series of serum estimations at suite intervals. It must be emphasised that tetany ends on the ionic state of the tissues, which probably ves in parallel with that of the serum and is theree effectively indicated by serum estimations. In the normal conditions created by an injection of BAL, cium ions, if withdrawn from the tissues, must pass o the serum, leading to the paradox of tetany *in the* sence of a high serum-calcium level.

The serum-calcium level (fig. 3) showed a preliminary of 0·9 mg. per 100 ml. in the first half-hour after the ection, followed by a *steady slow fall* and a smaller after the second injection, with a further tendency fall apparent in the last reading. Chvostek's sign, orded beneath the curve in column form, became maximal 1–1¹/₂ hours after the injection. An analys of the findings of Bennett et al. (1932) concerning physica signs and average serum-calcium estimations in 1 patients with idiopathic steatorrhœa suggests that laten tetany causing small depressions of the tissue calciun is more likely to give a positive Chvostek's sign than i overt tetany causing large depressions, whereas witl Trousseau's sign the opposite applies :

	History of acute tetany (10 cases)	*No history of acute tetany (5 cases)*
Serum-calcium ..	(5 1–9 0 mg. per 100 ml.)	(8 0–10 1 mg. per 100 ml.)
Average serum-calcium ..	7·66 mg. per 100 ml.	9 12 mg. per 100 ml.
Chvostek's sign..	5 positive ; 6 negative	4 positive ; 1 negative
Trousseau's sign..	6 positive ; 4 negative	None positive ; 5 negative

The rise in serum-calcium level in *the present* case in the absence of a *high-calcium diet*, suggests a withdrawal of calcium from the tissues into the blood at rate faster than its excretion. The period of study of thi *patient* was insufficient to reveal the later effects of BAI

In view of the sharp depression of nervous irritabilit towards the end of the test it was thought possible tha sodium was depleted at this time, but only insignifican changes in serum-sodium were detected (table II).

FURTHER STUDIES OF TOXICITY

The toxicity of BAL has been studied in 13 person receiving doses between 0·75 and 6·11 mg. per kg. c body-weight, and *the* results are recorded in *table* I.

There were no symptoms in case 5 (untreated gol dermatitis). All the other persons injected had toxi manifestations ; but, *in relation to* dosage, *these* wer *minimal* in case 11 (untreated arsenical dermatitis when given 6·11 mg. per kg. of body-weight. Thes observations suggest that, if there is an affinity betwee BAL and magnesium or calcium it is weaker than tha *between* BAL and gold *or* arsenic.

Difficulty was often experienced in the withdrawa of samples of venous blood 2–6 hours after the injection and *in inserting* the needle into the vein, and this wa *thought to* be due to venous spasm. *This difficult* was not noted in obtaining blood samples from control *previously injected* with 10% benzyl benzoate in arachi oil.

Serial serum chemical studies were made in 11 person (table II). We have *not found in* the literature *informatio* about the hour-by-hour variations throughout the da in calcium, magnesium, and phosphate levels in norma persons, and it is possible that the calcium figure recorded here represent fluctuations within norma *limits.* This seems less probable, however, for the rela tively greater changes *in* serum-magnesium. *The* calciun figures were somewhat equivocal but sometimes (case 6, 7, and 9) suggested *that* calcium had been withdraw from the tissues to the serum. On *the* other hand, case 10 who received 5·71 mg. of BAL *per* kg. *of body-weight* showed *minimal serum*-calcium changes though he ha severe pains, cramps, and parœsthesiæ and develope Chvostek's and Trousseau's signs. *Unfortunately* hi serum-magnesium was *not studied.* The maximum chang in serum-calcium level was about 10%. Since the control showed changes of up to 7·5%, though often in th opposite direction, *this* variation probably *cannot* b regarded as significant.

In 4 cases magnesium studies revealed changes o 65%, 50%, 24%, and 11% in the serum-magnesium level. Magnesium studies in two controls showed changes of 18% and 11%.

In 2 patients the serum-inorganic phosphorus was estimated and was found to vary by 26% and 21%. The changes in serum-potassium (3%) and serum-sodium

These symptoms and signs, in both conditions, may be summarised as manifestations of increased excitability of motor, sensory, and secretory nerves, the vegetative nervous system, and the higher centres.

CAUSES OF TETANY

The maintenance in the pericellular fluid of equilibrium between calcium, magnesium, and hydrogen ions on the one hand, and sodium, potassium, and hydroxyl ions on the other, is vital for the health of the cells controlling the heart-beat, the contractility of plain and striped muscle, and the transference of impulses at the neuro-muscular junctions and through synapses. Tetany is produced by increased nervous irritability resulting from a fall in calcium, magnesium, or hydrogen-ion concentration or a rise in that of sodium, potassium, or hydroxyl. Reverse changes lessen nervous irritability and alleviate tetany.

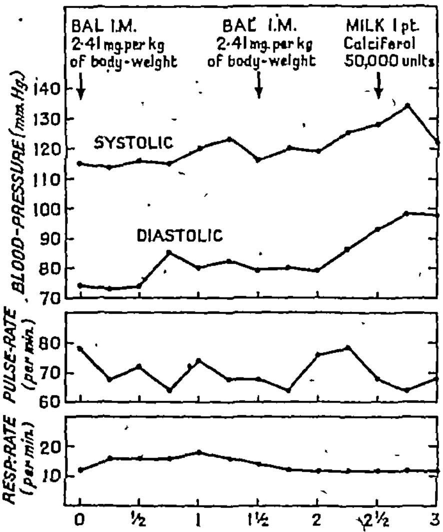


Fig. 1—Blood-pressure and respiration-rate after injection of BAL.

The more common known causes of tetany are (1) alkalosis, particularly from vomiting, excessive alkali ingestion, or hyperventilation, and (2) states of calcium insufficiency. In cattle, a deficiency of magnesium may also produce tetany ("grass tetany"), and Miller (1944) described a boy aged $3^1/_2$ years with osteochondritis who had had tetany since the age of 7 months but whose serum-calcium level was repeatedly within normal limits. The serum-magnesium content was 1·7 mg. per 100 ml., the low limit of normal. Magnesium sulphate grains 5 t.d.s. by mouth relieved the tetany, but there was a relapse on its withdrawal, with Chvostek's and Trousseau's signs present and a serum-magnesium level of 0·6 mg. per 100 ml.

ACTION OF BAL ON MAGNESIUM

In the extensive literature on BAL no reports have been found of any effect on calcium, but Webb and van Heyningen (1947), trying to explain its toxicity, noted its action on many enzymes in vitro and concluded that BAL probably acts as an antagonist of metal activation of enzymes, even interfering with the activation of enzymes activated by Mg^{++} enzymes—e.g., hexokinase. This effect was immediately reversed by the addition of excess Mg^{++}. They thought it an open question whether the toxicity of BAL is due to this inhibition of metal-containing enzymes, and noted further that, though BAL forms stable insoluble compounds with copper and iron, none are formed with Zn^{++} or Mg^{++} at neutral pH.

Barron et al. (1947) state that BAL combines with magnesium to form colourless soluble compounds, which may explain the inhibitory effect of magnesium chloride on the rate of oxidation of 'Dithiol,' noted to be 44% with 0·01 M.$MgCl_2$.

Calcium also forms no insoluble compounds with BAL in vitro.

CASE-RECORD

Our patient was a man aged 57, who had rheumatoid arthritis for twenty months.

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CLINICAL STUDY

Fifteen days after the last injection of BAL this patient attended again for serum-calcium and other studies before and after injections of BAL.

The test began at 2 P.M. and was preceded by a normal luncheon of meat and vegetables, boiled celery, *stewed apples*, and macaroni. This was considered unlikely to have any

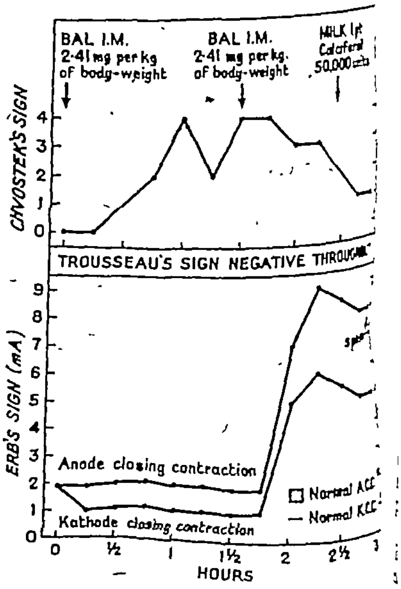

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TABLE II—SERUM ESTIMATIONS IN PERSONS TREATED WITH BAL

Constituent of serum	Case no.	Dose of BAL (mg. per kg. of body-weight)	Level in serum (mg. per 100 ml.)						
			Before injection	Hours after injection					
				½	1½	3	5–6	24	48
rum-calcium	1	0·75	10·5	10·3	10 2	10·6	11·1	11·2	11·3
	2	1·31	9 9	10 0	9 9	10 0	10·2	10 0	..
	3	1·43	10 6	10·8	11·0	10·5	..	11·2	11·0
	4	1·89	11·4	11·6	11·4	11 3	11 3	11·7	11·8
	5	2·07	10·1	9 8	..	..	..	..	..
	6	2·30	10·7	11·7	11·2	10 8	11·5	11·3	11·8
	7	2·41	9 9	10 8	10·1	..	..	..	..
	8	2 83	10·1	9·9	..	10 0	..	10 6	9·6
	9	3·34	11·1	12 2	11·8	11 8	12·2	..	..
	12	5·71	11·45	11·55	11·25	11·15	11·45	11·45	..
	13	6·11	10 5	10 4	10 0	10·1	10 0	10·1	..
	Controls	Equivalent dose							
	2A	1·31	10 8	10 0	10 1	10 2	10 4	..	..
	14	1·89	11·2	10·8	11 2	11·1	11·2	..	..
	16	2 89	10 5	10 8	10 9	11·2	10 9	..	..
um-magnesium		Dose of BAL							
	8	2·83	1·7	2·1	2 8	..	1·9	1·8	2·9
	10	3·93	2·9	2·2	2·7	2 6	2·7	2·7	..
	11	4·80	2·7	2 9	3 0	3 0	2 7	2·8	..
	13	6·11	2·0	2·1	2·3	2·3	2·7	3·0	..
	Controls	Equivalent dose							
	15	2 86	2 8	2·8	2 8	2 5	2 3	2·5	..
	17	4·62	2·7	2·9	2 8	2·8	2·7	3 0	..
rum-inorganic phosphorus		Dose of BAL							
	8	2 83	3·5	3 6	4·4	..	..	3·8	4·0
	13	6·11	3·4	3·3	3·3	3·1	3 8	2·7	..
rum-potassium		Dose of BAL							
	8	2·83	20 8	21·0	20·2	..	..	20 9	20·6
rum-sodium		Dose of BAL							
	7	2·41	334	341	340	336	..	..	..

owel is affected by the use of BAL, but this has not been arried out.

Electrocardiographic studies of this patient and ase 8 (table I) revealed no appreciable difference after he injection of BAL. The changes said to develop in ypoparathyroidism—a lengthening of systole and an ncrease of the Q-T interval from the normal of 0·3 *to* ·6 sec. (Rose 1943) with a low R and relatively high T vave (Zondek 1935 citing Schiff 1923)—were not bserved.

Fantl and Nance (1947), using Quick's (1938) technique, report inhibition of coagulation from prothrombin inactivation by BAL in vitro, not confirmed in vivo, no change being found in whole-blood coagulation-time or prothrombin activity at 1 and 2½ hours after the injection. Further, no change was noted in the coagulation-time when clotting was caused by the addition of thrombin. This difference of in-vitro and in-vivo findings might be explained by BAL's removal of part of the added calcium chloride from availability before it can react with prothrombin and thromboplastin to form thrombin.

The coagulation-time was studied by the method of Dale and Laidlaw in case 2, a psoriatic volunteer, both after an injection of 4 ml. of 10% benzyl benzoate in arachis oil and after 4 ml. of BAL representing 2·62 mg. per kg. of body-weight. The changes were regarded as too slight to be significant.

	Before test	*½ hr.*	*1 hr.*	*2 hr.*	*3 hr.*	*4 hr.*	*5 hr.*	*6½ hr.*
Control	2·15	—	1 40	2·14	1·20	1·45	1·52	1·36
BAL	1·12	1·32	1·22	1·59	1·42	1 55	2 07	2 06

(Time in minutes and seconds)

In an attempt to demonstrate skeletal changes radiographically two guineapigs were given injections of BAL averaging 29 and 16 mg. per kg. of body-weight daily for six weeks, a guineapig of similar age and size being used as control. No change in the bones was detected.

DISCUSSION

Clinically the symptoms and signs of BAL intoxication are identical with those of latent tetany. Experiments on animals have shown that some of the symptoms depend on parasympathetic innervation (Modell, Chenoweth, and Krop 1946) while increased "twitch tension" and the accumulation of lactate give evidence of increased muscular activity (Krop 1946).

That the tetany is not due to alkalosis is shown by our patient's normal alkali reserve and by the finding of metabolic acidosis in experiments on animals (Durlacher et al. 1946). Tetany might, however, arise from disturbance in pericellular ionic equilibrium between calcium and magnesium on the one hand, and sodium and potassium on the other. The changes in serum-magnesium in the 4 cases studied are relatively greater than those in serum-calcium found in any of the 11 persons. Nevertheless the changes in serum-inorganic phosphorus are by no means insignificant and may be related to some disturbance in calcium.

This incomplete study suggests that BAL has a selective influence on gold and arsenic far greater than on magnesium, and probably much greater on magnesium than on calcium. In the absence of metallic intoxications it may interfere with magnesium, and perhaps also calcium, metabolism. Attempts are being made to confirm or refute this theory of the cause of the latent tetany by intravenous injections of calcium gluconate or magnesium sulphate, in the presence of toxic symptoms. Patients receiving BAL might be included with those suffering from other conditions qualifying for extra milk.

The daily dose of 3 mg. per kg. recommended in this country appears unlikely to give trouble over short periods of treatment. On the other hand we have recently seen a patient who, while under treatment with BAL for arsenical dermatitis, developed somewhat rapidly symptoms of general paralysis of the insane. Since BAL not only removes arsenic but also seems to have an exciting influence on nervous tissue, it may perhaps provoke latent neurosyphilis into activity.

The increased risk of tetany in pregnancy is apparent, since Bogert and Plass (1923) found that the average calcium was 9·1 mg. per 100 ml. for 23 women at the time of labour, and 10·2 mg. for 12 normal non-pregnant women.

Control studies have not been made on potassium, sodium, and inorganic phosphorus. Potassium, being mainly intracellular, would be least likely to be affected.

If BAL has an affinity for calcium or magnesium it is likely to attract: serum-calcium or serum-magnesium ions, and serum-calcium or serum-magnesium loosely attached to plasma-protein, and to render these forms unavailable to the organism though still present in the blood. It is also likely to deplete the pericellular spaces of calcium or magnesium ions, and calcium or magnesium attached to protein; or the calcium and magnesium in this situation may only be rendered unavailable and not withdrawn, leading to steady serum-calcium and serum-magnesium levels.

On the hypothesis that BAL causes withdrawal of available calcium or magnesium from the blood and the tissues various possibilities may be considered. Where calcium is mentioned, similar possibilities for magnesium are to be inferred.

(1) If the withdrawal of calcium from the tissues is faster than the excretion of BAL with the calcium attached to it, there will be a rise in serum-calcium. If the rate of withdrawal is equal to the rate of excretion, there will be no apparent change in serum-calcium. If the excretion is more rapid than the withdrawal from the tissues, there will be a fall in serum-calcium.

(2) Whatever the primary change in serum-calcium, if the *displaced tissue calcium and BAL-attached serum-calcium* continue to be excreted, there must next follow a fall in serum-calcium, because it may be assumed that the flow from tissues to serum drops off before the excretion of the accumulated serum calcium is complete.

(3) The effect of BAL on the calcium in the bones must also be considered. It seems unlikely that it will cause a direct withdrawal of calcium from the bones; but, if the tissues are depleted of calcium, there must be a rapid withdr of calcium from the bones and teeth to replen vital kation deficiency.

In 6 cases the serum-calcium was higher (up to mg. per 100 ml.) 24 hours after the injection than be but in the 2 persons receiving the highest doses this not so. If, in fact, this secondary rise is due to withd of the calcium from the bones, it might be exp that there would be a parallel rise in the serum-inorg phosphate.

Kruse et al. (1933) state that magnesium defic is without apparent effect on the inorganic phosph content of the blood. Since magnesium ions are to activate bone phosphatase (which is inhibited inorganic phosphate), it seems essential for the well-be of the organism that this element should not be drawn from the bones. Changes in the serum-magnes in 2 patients studied were, however, associated changes considered significant in serum-inorganic phosphate. It follows that the rise in level of inorg phosphate may be related to changes in the tissue calc

According to Shohl (1939) 99·6% of the calc but only 57·9% of the magnesium in the body in the bones, whereas the total muscle content magnesium 6 g. and calcium 2 g. The rise in serum magnesium (up to 65%) after the injection is consistent with the relatively higher muscle-magnesium content as compared with calcium.

The urinary calcium excretion in one patient (case 5) showed hardly any change after a single dose of 200 mg. of BAL: 0·170 g. of calcium was excreted in the urine in the 24 hours before the injection, and 0·188 g in the 24 hours after it. A calcium-balance test is necessary to demonstrate whether the calcium excretion from

TABLE I—EFFECTS OF INTRAMUSCULAR BAL ON NERVOUS SYSTEM

Case no.	Subject	Age (years) and sex	Dose of BAL (mg. per kg. of body-weight)	Chvostek's sign (1, positive unilateral; 2, positive bilateral; 3, positive on one side, strongly positive on the other; 4, strongly positive bilateral)						Trousseau's sign	Cramps	Other symptoms
				Before BAL	After BAL (hours)							
					½	1½	3	5–6	24			
1	Student	23 M	0·75	0	0	1	0	1	0	0	+	0
2	Psoriasis	32 M	1·31	0	0	0	0	0	0	0	+	0
3	Student	21 M	1·43	0	0	0	0	0	0	0	+	0
4	Student	21 M	1·89	0	0	0	1	0	0	0	0	0
5	Untreated gold dermatitis	54 F	2·07	0	0	0	0	0	0	0	0	0
6	Student	22 M	2·30	0	2	3	1	0	2	0	+	0
7	Treated gold dermatitis	57 M	2·41	0	1	4	1	..	..	0	0	0
8	Morphœa	63 F	2·83	0	2	2	..	0	0	0	0	0
9	Student	21 M	3·34	0	0	0	0	0	..	0	+	Vomited at hour
10	Volunteer	58 M	3·93	0	0	0	0	0	0	0	+	Vomited hour
11	Seborrhœic dermatitis	15 M	4·80	0	4	4	2	2	0	0	+	Vomited hour
12	Seborrhœic dermatitis	25 M	5·71	0	1	4	0	0	0	+ at ½ hour	+ +	Pains in ears, ch abdom strictu throat
13	Untreated arsenical dermatitis	30 F	6·11	0	0	0	0	0	0	0	+	Abdominal with m spasm
				CONTROLS								
2A	Psoriasis	32 M	1·31*	0	0	0	0	0	0	0	0	0
14	Student	22 M	1·90*	0	0	0	0	0	0	0	0	0
15	Hypostatic ulcers	55 M	2·86*	0	0	2 ±	1 ±	1 ±	1 ±	0	0	0
16	Student	21 M	2·80*	0	0	0	0	0	0	0	0	0
17	Hypostatic eczema	39 M	4·62*	0	0	0	0	0	0	0	0	0

* Dose of 10% benzyl benzoate in arachis oil equal to that used to give BAL mg. per kg.

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Constituent of serum	Case no.	Dose of BAL (mg. per kg. of body-weight)	Level in serum (mg. per 100 ml.)						
			Before injection	Hours after injection					
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	2	1·31	9·9	10·0	9·9	10·0	10·2	10·0	..
	3	1·43	10·6	10·8	11·0	10·5	..	11·2	11·0
	4	1·89	11·4	11·0	11·1	11·3	11·3	11·7	11·8
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	12	5·71	11·16	11·55	11·25	11·15	11·45	11·45	..
	13	6·11	10·5	10·4	10·0	10·1	10·0	10·1	..
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	2A	1·31	10·8	10·0	10·1	10·2	10·4	..	..
	14	1·99	11·2	10·8	11·2	11·1	11·2	..	..
	16	2·80	10·5	10·8	10·9	11·2	10·9	..	..
		Dose of BAL							
um-magnesium	8	2·83	1·7	2·1	2·8	..	1·0	1·8	2·9
	10	3·93	2·9	2·2	2·7	2·6	2·7	2·7	..
	11	4·80	2·7	2·0	3·0	3·0	2·7	2·8	..
	13	6·11	2·0	2·1	2·3	2·3	2·7	3·0	..
	Controls	Equivalent dose							
	15	2·86	2·8	2·8	2·8	2·5	2·3	2·5	..
	17	4·62	2·7	2·9	2·8	2·8	2·7	3·0	..
		Dose of BAL							
rum-inorganic phosphorus	8	2·83	3·5	3·6	4·4	..	..	3·8	4·0
	13	6·11	3·4	3·3	3·3	3·1	3·8	2·7	..
		Dose of BAL							
rum-potassium	8	2·83	20·8	21·0	20·2	..	..	20·9	20·6
		Dose of BAL							
rum-sodium	7	2·41	334	341	340	336	..	..	..

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	Before test	*½ hr.*	*1 hr.*	*2 hr.*	*3 hr.*	*4 hr.*	*5 hr.*	*6½ hr.*
ontrol	2·15	—	1·40	2·14	1·20	1·46	1·52	1·36
AL	1·12	1·32	1·22	1·59	1·42	1·55	2·07	2·06

(Time in minutes and seconds)

In an attempt to demonstrate skeletal changes radiographically two guineapigs were given injections of BAL averaging 29 and 16 mg. per kg. of body-weight daily for six weeks, a guineapig of similar age and size being used as control. No change in the bones was detected.

DISCUSSION

Clinically the symptoms and signs of BAL intoxication are identical with those of latent tetany. Experiments on animals have shown that some of the symptoms depend on parasympathetic innervation (Modell, Chenoweth, and Krop 1946) while increased "twitch tension" and the accumulation of lactate give evidence of increased muscular activity (Krop 1946).

That the tetany is not due to alkalosis is shown by our patient's normal alkali reserve and by the finding of metabolic acidosis in experiments on animals (Durlacher et al. 1946). Tetany might, however, arise from disturbance in pericellular ionic equilibrium between calcium and magnesium on the one hand, and sodium and potassium on the other. The changes in serum-magnesium in the 4 cases studied are relatively greater than those in serum-calcium found in any of the 11 persons. Nevertheless the changes in serum-inorganic phosphorus are by no means insignificant and may be related to some disturbance in calcium.

This incomplete study suggests that BAL has a selective influence on gold and arsenic far greater than on magnesium, and probably much greater on magnesium than on calcium. In the absence of metallic intoxications it may interfere with magnesium, and perhaps also calcium, metabolism. Attempts are being made to confirm or refute this theory of the cause of the latent tetany by intravenous injections of calcium gluconate or magnesium sulphate, in the presence of toxic symptoms. Patients receiving BAL might be included with those suffering from other conditions qualifying for extra milk.

The daily dose of 3 mg. per kg. recommended in this country appears unlikely to give trouble over short periods of treatment. On the other hand we have recently seen a patient who, while under treatment with BAL for arsenical dermatitis, developed somewhat rapidly symptoms of general paralysis of the insane. Since BAL not only removes arsenic but also seems to have an exciting influence on nervous tissue, it may perhaps provoke latent neurosyphilis into activity.

The increased risk of tetany in pregnancy is apparent, since Bogert and Plass (1923) found that the average calcium was 9·1 mg. per 100 ml. for 23 women at the time of labour, and 10·2 mg. for 12 normal non-pregnant women.

Control studies have not been made on potassium, sodium, and inorganic phosphorus. Potassium, being mainly intracellular, would be least likely to be affected.

If BAL has an affinity for calcium or magnesium it is likely to attract: serum-calcium or serum-magnesium ions, and serum-calcium or serum-magnesium loosely attached to plasma-protein, and to render these forms unavailable to the organism though still present in the blood. It is also likely to deplete the pericellular spaces of calcium or magnesium ions, and calcium or magnesium attached to protein; or the calcium and magnesium in this situation may only be rendered unavailable and not withdrawn, leading to steady serum-calcium and serum-magnesium levels.

On the hypothesis that BAL causes withdrawal of available calcium or magnesium from the blood and the tissues various possibilities may be considered. Where calcium is mentioned, similar possibilities for magnesium are to be inferred.

(1) If the withdrawal of calcium from the tissues is faster than the excretion of BAL with the calcium attached to it, there will be a rise in serum-calcium. If the rate of withdrawal is equal to the rate of excretion, there will be no apparent change in serum-calcium. If the excretion is more rapid than the withdrawal from the tissues, there will be a fall in serum-calcium.

(2) Whatever the primary change in serum-calcium, if the displaced tissue calcium and BAL-attached serum-calcium continue to be excreted, there must next follow a fall in serum-calcium, because it may be assumed that the flow from tissues to serum drops off before the excretion of the accumulated serum calcium is complete.

(3) The effect of BAL on the calcium in the bones must also be considered. It seems unlikely that it will cause a direct withdrawal of calcium from the bones; but, if the tissues are depleted of calcium, there *must* be a rapid wit of calcium from the bones and teeth to replen vital kation deficiency.

In 6 cases the serum-calcium was higher (up to mg. per 100 ml.) 24 hours after the injection than but in the 2 persons receiving the highest doses thi not so. If, in fact, this secondary rise is due to withdra of the calcium from the bones, it might be e that there would be a parallel rise in the serum-inor phosphate.

Kruse et al. (1933) state that magnesium defic is without apparent effect on the inorganic phosph content of the blood. Since magnesium ions are to activate bone phosphatase (which is inhibited inorganic phosphate), it seems essential for the well-b of the organism that this element should not be w drawn from the bones. Changes in the serum-magne in 2 patients studied were, however, associated changes considered significant in serum-inorganic ph phate. It follows that the rise in level of inorg phosphate may be related to changes in the tissue calc

According to Shohl (1939) 99·6% of the calc but *only 57·9% of the magnesium in the body* in the bones, whereas the total muscle content magnesium 6 g. and calcium 2 g. The rise in serum magnesium (up to 65%) after the injection is consiste with the relatively higher muscle-magnesium conte as compared with calcium.

The urinary calcium excretion in one patient (case 5) showed hardly any change after a single dose of 200 mg. of BAL: 0·170 g. of calcium was excreted in the uri in the 24 hours before the injection, and 0·188 g in th 24 hours after it. A calcium-balance test is necessary demonstrate whether the calcium excretion from

TABLE I—EFFECTS OF INTRAMUSCULAR BAL ON NERVOUS SYSTEM

Case no.	Subject	Age (years) and sex	Dose of BAL (mg. per kg. of body-weight)	Chvostek's sign (1, positive unilateral; 2, positive bilateral; 3, positive on one side, strongly positive on the other; 4, strongly positive bilateral)						Trousseau's sign	Cramps	Other symptoms
				Before BAL	After BAL (hours)							
					½	1½	3	5–6	24			
1	Student	23 M	0·75	0	0	1	0	1	0	0	+	0
2	Psoriasis	32 M	1·31	0	0	0	0	0	0	0	+	0
3	Student	21 M	1·43	0	0	0	0	0	0	0	+	0
4	Student	21 M	1·89	0	0	0	1	0	0	0	0	0
5	Untreated gold dermatitis	54 F	2·07	0	0	0	0	0	0	0	0	0
6	Student	22 M	2·30	0	2	3	1	0	2	0	+	0
7	Treated gold dermatitis	57 M	2·41	0	1	4	1	..	..	0	0	0
8	Morphœa	63 F	2·83	0	2	2	..	0	0	0	0	0
9	Student	21 M	3·34	0	0	0	0	0	..	0	+	Vomited [illegible] hour
10	Volunteer	58 M	3·93	0	0	0	0	0	0	0	+	Vomited [illegible] hour
11	Seborrhœic dermatitis	15 M	4·80	0	4	4	2	2	0	0	+	Vomited [illegible] hour
12	Seborrhœic dermatitis	25 M	5·71	0	1	4	0	0	0	+ at ½ hour	+ +	Pains in ears, ch abdom striction throat
13	Untreated arsenical dermatitis	30 F	6·11	0	0	0	0	0	0	0	+	Abdominal [illegible] with [illegible] spasm
	CONTROLS											
2A	Psoriasis	32 M	1·31*	0	0	0	0	0	0	0	0	0
14	Student	22 M	1·99*	0	0	0	0	0	0	0	0	0
15	Hypostatic ulcers	55 M	3·86*	0	0	2 ±	1 ±	1 ±	1 ±	0	0	0
16	Student	21 M	2·89*	0	0	0	0	0	0	0	0	0
17	Hypostatic eczema	39 M	4·62*	0	0	0	0	0	0	0	0	0

* Dose of 10% benzyl benzoate in arachis oil equal to that used to give BAL mg. per kg.

TABLE II—SERUM ESTIMATIONS IN PERSONS TREATED WITH BAL

onstituent of serum	Case no.	Dose of BAL (mg. per kg. of body-weight)	Level in serum (mg. per 100 ml.)						
			Before injection	Hours after injection					
				1/2	1 1/2	3	5–6	24	48
um-calcium	1	0·75	10·5	10·3	10 2	10·6	11·1	11·2	11·3
	2	1·31	9 9	10 0	9 9	10·0	10·2	10 0	..
	3	1·43	10·6	10·8	11·0	10·5	..	11·2	11·0
	4	1·89	11·4	11·6	11·1	11 3	11·3	11·7	11·8
	5	2·07	10·1	9 8	..	..	..	..	..
	6	2·30	10·7	11·7	11·2	10·8	11·5	11·3	11·8
	7	2·41	9·9	10·8	10·1	..	..	..	..
	8	2·83	10·1	9·9	..	10 0	..	10 6	9 6
	9	3·31	11·1	12 2	11·8	11·8	12·2	..	..
	12	5·71	11·45	11·55	11·25	11·15	11·45	11·45	..
	13	6·11	10·5	10 4	10 0	10·1	10·0	10·1	..
	Controls	Equivalent dose							
	2A	1·31	10 8	10·0	10·1	10·2	10·4	..	..
	14	1·99	11·2	10·8	11·2	11·1	11·2	..	..
	16	2·89	10 5	10 8	10 9	11·2	10 9	..	..
am-magnesium		Dose of BAL							
	8	2·83	1·7	2·1	2·8	..	1·9	1·8	2·9
	10	3·93	2·9	2·2	2·7	2·6	2·7	2·7	..
	11	4·80	2·7	2 0	3·0	3·0	2·7	2·8	..
	13	6·11	2·0	2·1	2·3	2·3	2·7	3 0	..
	Controls	Equivalent dose							
	15	2·86	2 8	2·8	2·8	2 5	2·3	2·5	..
	17	4·62	2·7	2·9	2·8	2·8	2·7	3·0	..
rum-inorganic phosphorus		Dose of BAL							
	8	2·83	3·5	3 6	4·4	..	..	3·8	4·0
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rum-potassium		Dose of BAL							
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	Before test	*1/2 hr.*	*1 hr.*	*2 hr.*	*3 hr.*	*4 hr.*	*5 hr.*	*6 1/2 hr.*
Control	2·15	—	1·40	2·14	1·20	1·46	1·52	1·36
BAL	1·12	1·32	1·22	1·59	1·42	1·55	2·07	2 06

(Time in minutes and seconds)

In an attempt to demonstrate skeletal changes radiographically two guineapigs were given injections of BAL averaging 29 and 16 mg. per kg. of body-weight daily for six weeks, a guineapig of similar age and size being used as control. No change in the bones was detected.

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The increased risk of tetany in pregnancy is apparent, since Bogert and Plass (1923) found that the average calcium was 9·1 mg. per 100 ml. for 23 women at the time of labour, and 10·2 mg. for 12 normal non-pregnant women.

SUMMARY

A case is reported in which latent tetany developed during intramuscular administration of BAL.

Studies of 13 patients and volunteers receiving doses of BAL between 0·75 and 6·11 mg. per kg. of body-weight revealed, besides toxic symptoms, a positive Chvostek's sign in 7, of whom 1 also had a positive Trousseau's sign. Of the remainder, 5 had cramps and other toxic symptoms, and 1 was free from symptoms.

Serum studies suggest that the tetany may be of low-magnesium and possibly also of low-calcium type, either from these kations being rendered unavailable to the cells or being removed attached to BAL.

All the symptoms of toxicity from BAL are capable of explanation as latent tetany. Calcium-balance and magnesium-balance studies are necessary to explain the metabolic disturbances.

In doses of 3·14 mg. per kg. of body-weight daily for four days BAL gives great relief to sufferers from arsenic, gold, and mercury intoxications, and the danger of a temporary unavailability of pericellular calcium and magnesium can be ignored if the patient is provided with a high-calcium diet, magnesium sulphate, and vitamin D.

The serum-sodium and serum-potassium levels were not appreciably affected by the injection of BAL.

In 5 controls injected with 10% benzyl benzoate in arachis oil in volumes equivalent to those used in giving between 1·31 and 4·62 mg. of BAL per kg. of body-weight, no symptoms of latent tetany developed, but 1 had a doubtfully positive Chvostek's sign $1^1/_2$ hours after the injection.

Acknowledgments are due to colleagues in the pathological, physiotherapeutic, cardiographic, and X-ray departments for their help, and in particular to Mr. Ralph Hudson for his blood estimations, and to the student volunteers.

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"... Security with regard to avoidance of war cannot be assured by purchase of military equipment or any amount of research in applications of physical and biological science to military technology. . . . The entire documented history of man stresses the danger and folly of such reliance. The only way to security in international relations lies in a devotion to study of the social problems confronting mankind as a whole. This calls for an undreamed of development of all the social sciences and their application to social problems in a spirit of high responsibility. It calls for an approach to such problems which is not limited by traditional thinking in terms of group rivalries of any kind. It will not be easy, just as it is not easy to develop supersonic jet planes and guided missiles."—E. U. CONDON, director, National Bureau of Standards, Washington, *Science*, June 25, p. 665.

TREATMENT OF TUBERCULOSIS WI SULPHETRONE

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'SULPHETRONE' was shown by Brownlee et al. (19 to be antituberculotic, and subsequently Brownlee and Kennedy (1948a) demonstrated its efficiency in protecting animals against experimental tuberculous infection. The pharmacological evidence pointed to low toxicity and suggested its suitability for administration to man over long periods at blood-levels likely to prove bacteriostatic to tubercle bacilli.

In 1943 a clinical trial of sulphetrone was organised and developed in this hospital. The choice of clinical material was dictated solely by its presentation within the hospital; thus it represents a statistically unselected population drawn on for five years. Pulmonary cases predominated, but all kinds of tuberculosis were included. It was impracticable to devise a controlled experiment in the sense of a side-by-side comparison, chiefly because of the impossibility of predicting the course of tuberculosis in apparently similar cases, but also because the patient must unquestionably be granted the advantages of orthodox active therapy. In the present series of 70 cases, when due regard has been paid to all available conservative and mechanical aids, assessment depends on experienced clinical judgment.

MANAGEMENT

Since an effective level of sulphetrone has to b maintained in blood and other tissues for a very time, management assumes major importance. comprehensive pharmacological study by Brownlee (1948) going forward simultaneously enabled difficulties to be anticipated or recognised at an e stage. Some, such as the development of the blood-l and variations in absorption and excretion, first arose clinical problems. Attention was also drawn to th patient's nutrition, the blood-picture proving of particula value in this connexion. Where nutritional imbala was detected, the necessary correctives were applied. From the solution of these early difficulties the follow scheme of management evolved.

Preliminary Nutrition

Routine investigations showed tuberculous patients in general to be poorly nourished, a fact widely recognised (Braverman 1938, 1942). A frequent manifestation w secondary anæmia, which may assume major importa in view of the capacity of sulphetrone to interfere w biosynthesis in the gut (Brownlee et al. 1948). Subcli liver dysfunction may be uncovered by drug thera it may be anticipated and tested for by repeated bilir estimates, which in my experience constitute the suitable liver-function test for this purpose. After in blood analyses and differential white-cell counts a co of ferrous sulphate gr. 3 by mouth three times d together with fresh brewers' yeast 2 drachms daily, given for a fortnight before and throughout sulphetr therapy. It is important that the yeast should be brew yeast and, to obtain full value from it, the cells sh be ruptured by heating the yeast in milk nearly boiling-point, and giving it as soon as it is c enough to drink. This regimen makes good the hy chromic anæmia and the nutritional anæmia caused sulphetrone.

A third form of anæmia, hæmolytic anæmia, devel and continues throughout the administration of sulph trone; it is responsible for a reduction in hæmoglob level as low as 60% (Haldane). Should the hæmo- in level fall below this figure, sulphetrone should be ndrawn. This hæmolytic anæmia is rarely seen when and yeast are given: its presence indicates a ificant nutritional deficiency. Yeast also prevents the t of a peripheral neuritis, otherwise occasionally seen. ith continued pyrexia the patient may be in negative ogen balance: usually there is a ready response to mic animal-protein hydrolysate, combined with ohydrate, of each 1 g. per kg. of body-weight daily.

Rest

ice the immediate effect of exhibiting sulphetrone e imposition of an additional load on the patient, bed rest in the case of acute or subacute lesions is sary. Less severe discipline is needed with chronic ns, and outpatient therapy may be practised in the nce of constitutional disturbance.

ge and Blood-level

ownlee and Kennedy (1948a and b) showed that eapigs could be protected against tuberculosis by ntaining blood-sulphetrone levels of 5–6 mg. per ml. It seemed logical to raise this level in man ards the highest limits of tolerance, and concentra- s of 7·5–10 mg. per 100 ml. were aimed at. Clinical erience showed that massive initial doses were not tolerated; so a schedule of gradually increasing s was adopted. A suitable initial dose for adults 5 g. daily (0·5 g. eight-hourly) for the first week, and daily (0·5 g. four-hourly) for the second. Thereafter daily dose is increased by 1–2 g. each week until apeutic blood-sulphetrone levels are reached, usually a dose of 6–10 g. daily. To ensure undisturbed rest ight two four-hourly doses are omitted and the last ning and the first morning doses are doubled. For dren up to the age of 3 years an initial dose of 0 5 g. y, followed by 1 g. in the second week, is recom- ded; in children aged 4–10 years the initial dose is . and thereafter the dose is increased as for adults; ldren aged 11–15 may receive full adult dosage.

Vhen it is desirable to administer sulphetrone intra- scularly combined with streptomycin for miliary erculosis or for tuberculous meningitis, 0 05 g. per of body-weight every four to six hours for the first nty-four hours is suitable. This dosage should be ed, after the blood-sulphetrone level has been mated, to 0·1 g. per kg. of body-weight during the ond twenty-four hours. There is some evidence that, en the meninges are involved, blood-sulphetrone levels ve 5 mg. per 100 ml. may cause vomiting.

Besides a weekly check of red cells and hæmoglobin re should be a weekly estimate of blood-sulphetrone. table methods have been described by Brownlee et al. 48). Renal clearance of sulphetrone is rapid, and total y fluids should be restricted to three pints to maintain adequate level of sulphetrone in the tissues, since the the fluid intake the greater the saturation with hetrone. Conversely, clearance of sulphetrone is elerated by raising fluid intake. Climatic conditions ct the sulphetrone level in the tissues for the same on. The blood-level should not exceed 12·5 mg. 100 ml.; this level allows little margin of safety, sulphetrone must be temporarily discontinued if s exceeded. If, on withdrawal of sulphetrone, levels ve this figure are still found, fluids should be pushed all routes, and enemas given. No major catastrophe o be expected unless levels above 12·5 mg. per 100 ml. sist for several days.

icity

he first three weeks of sulphetrone therapy are a iod of physiological readjustment. Minor symptoms slight headache, difficulty in reading and in concen- tion, temporary depression, and nausea. Blueness of skin and mucosæ is often observed at this initial stage during a period of low dosage. These manifestations call for no treatment other than reassurance. Adjustment is quicker in young people and children, and slower in the older age-groups and in those with diminished vital capacity. The blueness is believed to be associated with disturbance of the alkali reserve. The symptoms are alleviated by sodium bicarbonate and less effectively by other alkalis.

Moderate or severe continuous headache, loss of appetite, nausea and vomiting, gastro-intestinal discomfort, dizziness, and mental confusion are danger signals. These conditions are associated with high blood-sulphetrone levels; therefore measures should be initiated to hasten elimination of sulphetrone. It should be remembered that there is always a substantial reservoir of unabsorbed sulphetrone in the gut (Brownlee et al. 1948). Stasis is therefore always to be guarded against. Another risk, exemplified in the present series, is tuberculous ulceration of the gut, leading to immediate increased absorption of sulphetrone.

TABLE I—SUMMARISED RESULTS OF SULPHETRONE THERAPY IN TUBERCULOSIS

Group	Form of tuberculosis	Improvement			No change	Worse	Died	Total
		+++	++	+				
I	*Meningitis:*							
	(a) Presenting with meningitis ..	..	..	..	..	..	3	3
	(b) Presenting with miliary disease of lungs, later meningitis	..	..	..	..	..	1	1
	(c) Presenting with chronic miliary disease of lungs ..	1	..	..	..	..	..	1
II	*Primary pulmonary:*							
	(a) Mediastinal glands with lobar or segmental collapse	..	3	..	..	..	..	3
	(b) Adult type with primary cavitation	1	..	..	..	..	..	1
III	Strictly exudative lesions (unilateral or bilateral)	..	5	1	2	..	..	8
IV	Chronic bilateral pulmonary hæmatogenous (mainly upper zones)	..	4	..	..	..	..	4
V	Essentially productive pulmonary infiltration	..	..	3	1	..	..	4
VI A	*Acute pulmonary fibrocaseous disease:*							
	(a) Bilateral.. ..	..	1	..	..	..	..	17
	(b) Unilateral ..	..	2	1	1	..	1	
	(c) Unilateral, with contralateral exudation ..	1	3	1	..	..	..	
	(d) Bilateral, complicated by spreading tuberculous bronchopneumonia	1	1	1	..	..	3	
VI B	*Chronic pulmonary fibrocaseous disease:*							
	(a) Bilateral.. ..	3	6	2	5	1	..	22
	(b) Unilateral ..	..	1	..	..	1	..	
	(c) Unilateral, with contralateral exudation ..	..	..	..	1	..	..	
	(d) Bilateral, complicated by spreading tuberculous bronchopneumonia	..	1	..	..	1	..	
VII	Bronchopneumonic ..	..	1	..	1	..	..	2
VIII	Serous pleural and peritoneal effusion..	1	..	..	..	..	..	1
IX	*Urogenital:*							
	(a) Uncomplicated ..	..	1	..	..	..	..	2
	(b) Associated with bilateral pulmonary tuberculosis..	..	..	1	..	..	..	
X	Skeletal	..	1	..	..	..	..	1

It has been convenient to summarise the systematic management of sulphetrone patients in the form of a special chemotherapy chart devised by Anderson and Strachan (1948), which, besides the temperature, pulse, respiration, and weight, shows the intake of sulphetrone and the blood-sulphetrone level, fluid intake and output, blood-picture, hæmoglobin concentration, erythrocyte-sedimentation rate (E.S.R.), and the bacteriological findings.

MATERIAL

Sulphetrone therapy was investigated in the following groups: (1) early, purely exudative, limited pulmonary lesions, where collapse therapy was not considered essential; (2) chronic bilateral hæmatogenous pulmonary lesions; (3) unilateral fibrocaseous disease, to prevent local or contralateral exudative spread and render surgical intervention less hazardous; (4) extensive bilateral disease, to make the patient fit for surgery; and (5) outpatients whose condition had not materially improved after one or more periods of sanatorium treatment. Of the outpatients, 8 had progressive bilateral fibrocaseous disease of an extent which contra-indicated surgical intervention, 2 had chronic bilateral hæmatogenous pulmonary foci, 3 had productive infiltration, and 3 had essentially exudative pulmonary lesions. No special restrictions were imposed on these outpat so that, should improvement result the analysis wo not be complicated by ancillary therapy.

RESULTS

Table I summarises the results in 70 cases. For co venience the grouping is based on a descriptive ra than a pathological classification. The therape assessment of sulphetrone is based on changes in weig E.S.R., and bacteriology of sputum; clinical and ra logical improvement; and achievement of the spec target, a point on which particular emphasis is l Table II gives additional details showing typical respo to sulphetrone in 25 cases.

Group I: Meningitis.—In 3 cases of proved tubercu meningitis in a late stage no benefit was derived from sulph trone; 1 case of miliary tuberculosis of lungs progressed t tuberculous meningitis. The fifth patient presented w chronic miliary tuberculosis. The miliary pattern resolv after thirteen weeks of streptomycin therapy, but four wee later there was a vicious flare-up in the left hilar glands, w much constitutional disturbance and a rise in E.S.R. fr *18 to 52 mm.* (Westergren). This acute exacerbation cau anxiety in view of our experience of the establishment o *streptomycin-resistant strains in other cases* (Madigan et a 1947), sulphetrone was exhibited in adequate dosage, and two months later the hilar glandular enlargement had subsid

TABLE II—TYPICAL CASE SUMMARIES

Group as table I	Sex and age (yr.)	Clinical history	Total dose (g.)	Days	Av. blood-sulphetrone level (mg. per 100 ml.)	Weight	E.S.R. (mm. in 1st hr.)	Sputum	Summary	Resu
I (*a*)	M 19	Comatose on admission (April 12, 1943). Meningitis late stage, bacteriologically proved. Coarse miliary mottling of lungs on radiogram	30	5	5–8 (2·6–4·4 in C.S.F.)	..	..	+/+	Adequate levels in blood and C.S.F. per i.m. inj. of 1 g. 4-hourly. No response	Di
I (*c*)	M 6½	Contact. Lt. hilar adenitis and coarse miliary tuberculosis. Mantoux +	1169	168	4–8	Gain 1½ st.	52/8 (W)	Nil*	Streptomycin modified course of disease; E.S.R. 22–18 (W) with miliary pattern resolved after 13 weeks' streptomycin. Vicious flare-up 4 weeks later in lt. hilar glands; E.S.R. 18–52 (W). Sulphetrone gave focal quiescence. Discharged well at 5 mos.	[illegible]
II	M 9	Contact. Mantoux +. Radiogram showed rt. hilar adenitis, collapsed rt. middle lobe, foci rt. upper lobe	1163	201	4–9	Gain 7 lb.	25/4	–/–	Rt. middle lobe collapsed 1 yr. before sulphetrone. 3 mos. later it partially opened up. E.S.R., raised for many months, dropped quickly	Impr
III	F 20	Bad family history. Admitted Sept. 12, 1946. Radiogram showed exudative infiltration medial part of lt. apical segment; round focus 2nd lt. interspace. Constitutional disturbance	542	139	6	Gain 10 lb.	4/3 (C)	+/–	General improvement. Radiogram (March 22, 1947) showed infiltration reduced, evidence of calcification. Tomogram (Dec. 18, 1947) showed no cavity, calcification left apex	Impr
III	F 19	Very bad family history. San. and 2 yr. obs. before sulphetrone. Lesions unstable. Radiogram (Feb. 1, 1945) showed patchy exudative infiltration upper and middle zones both lungs	826	149	5	Gain 11 lb.	9/7 (C)	+/–	Radiogram (Sept. 14, 1945) showed much less infiltration, replacement by linear scars. Calcification appeared earlier than usual	Impr
III	M 47	Radiogram (Dec. 16, 1942) showed exudative infiltration upper ⅔ on groundwork of coarse strands; small cavity rt. upper lobe. 181 days on sulphetrone in san., remainder as O.P.	2340	390	6	Gain 1 st.	25/3	+/–	Radiogram (Sept. 2, 1943) showed exudation much reduced; fibrotic strands; much focal calcification. Tomogram showed no cavitation. Now in excellent health. At work 2 yr.	Very impr
IV	F 22	Four yr. after pleural effusion, radiogram showed chronic bilateral hæmatogenous foci lt. upper ½ and rt. upper ½; foci rt. lower ⅓. Treated as O.P.	213	98	3–6	Gain 4 lb.	14/3	–/–	Fading and loss of definition in lesions on radiogram (Feb. 5, 1946). Satisfactory result of treatment as O.P.	Imp
IV	F 20	Mass radiog (Jan. 26, 1946) showed chronic hæmatogenous lesions in lt. upper ½, rt. apex, 1st and 2nd interspaces. Treated as O.P. 2 mos. and as inpatient 4 mos.	750	192	3–6	Gain 7 lb.	12/3	–/–	Radiogram (Sept. 4, 1946) showed regression and fading of hæmatogenous foci	Imp
V	M 45	Mass radiog. (May 28, 1945) showed bilateral productive infiltration rt. upper ⅓, lt. upper ⅔. San. 6 mos.; improved pro tem. Disease unstable. Recrudescence July, 1947. Sulphetrone therapy begun Nov. 25, 1947, as O.P. while continuing work	484	140	4–7	Loss	45/17 (W)	+/–	Definite regression and fading of the infiltration seen on radiogram (Feb., 1948) Continued work	Im
VI A	M 39	Ex-P.O.W. Japan Radiogram (June 5, 1946) showed acute fibrocaseous disease rt. upper lobe with cavitation; infiltration rt. lower lobe. Severe constitutional disturbance	880	216	2–7	Gain 11 lb.	30/4 (C)	+/–	Hectic fever modified 12 days after sulphetrone therapy begun. Combined with streptomycin 20 days later. Disease rapidly converted from acute to chronic form; cavity closed. Relapse 4 mos later	Impr

TABLE II—*continued*

Sex and age (yr.)	Clinical history	Total dose (g.)	Days	Av. blood-sulphetrone level (mg. per 100 ml.)	Weight	E.S.R. (mm. in 1st av.)	Sputum	Summary	Results
F 18	Acute bilateral fibrocaseous disease upper lobes. Tuberculous bronchopneumonia lower lobes. Small cavity rt. upper lobe. Large cavity lt. upper lobe. Much constitutional disturbance	2590	370	8–10	Gain 1 st. 5 lb.	60/22 (W)	+/+	Prognosis very grave, but infiltration markedly regressed; cavities smaller, original bronchopneumonic foci now calcified. Radiogram (Jan., 1948) shows fibrocalcareous disease; small thin-walled cavity lt. upper lobe	Much improved
M 16	Very bad family history. Radiogram (Oct., 1944) showed acute fibrocaseous disease rt. upper ²/₃. Exudative infiltration lt. lung spread considerably in 2 weeks. Grave constitutional disturbance. Too ill for active treatment	641	130	5–8	Gain 1 st. 3 lb.	21/8 (C)	+/−	After 1 mo. on sulphetrone infiltration of lt. lung reduced. After 4 mos. on drug reduction of bilateral infiltration such that rt. A.P. possible with less risk of complication	Improved
M 20	Acute bilateral fibrocaseous disease. 18 mos. in san. but continued to deteriorate. Rt. A.P. complicated by mixed empyema and bronchopleural and cutaneous fistulæ. Taken from san. moribund. Treated with sulphetrone at home	750	150	4–6	Stationary	..	+/+	After 1 mo. on sulphetrone appeared less toxic; no effect on empyema, but bronchopneumonic disease lt. 1, 2 improved. A month after withdrawal of drug patient died	Died
F 18	Radiogram (Nov. 18, 1943) showed acute fibrocaseous disease lt. 1, 2; large cavity lt. upper lobe; some infiltration rt. lower lobe. Much constitutional disturbance. Unsuitable for lt. A.P.	†	†	5–7	Loss 4 lb.	21/18 (C)	+/+	After first 6 mos.' course much reduction of infiltration. At end of 2nd course in san. began to deteriorate; discharged. 3rd course given in hosp. with P.P. Improved again and fit for lt. thoracoplasty; four-stage op. performed Autumn, 1947	Improved
F 28	Very toxic; radiogram (Aug. 24, 1943) showed acute fibrocaseous disease rt. upper lobe; patchy exudation lt. middle ¹/₃. Too toxic for active treatment	700	152	6	Gain 15 lb.	22/10 (C)	+/−	Rt. A.P. risked 2 mos. after sulphetrone; abandoned owing to massive effusion after attempted section of adhesions. Effusion remained sterile; sputum became neg. Very well Feb., 1948; no thoracoplasty necessary	Much improved
F 32	Bilateral pulmonary tuberculosis for 9 yr. In hospital since Sept. 2, 1946. General deterioration. Tuberculous larynx. Radiogram showed bilateral fibrocaseous disease	394	146	1	Not weighed	28/28 (W)	+/+	Too toxic for adequate daily dosage. Deterioration not halted	Died
M 13	Radiogram (June 1, 1946) showed bilateral chronic fibrocaseous disease all lobes. Little gained by san. and P.P. Sulphetrone given as O.P. from June 25, 1947	750	248	1–5	Gain 3 lb.	120/90 (W)	+/−	Infiltration decreasing; replacement fibrosis; focal calcification more clearly defined; cavities still open	Slightly improved
M 27	Diagnosed 1941. Radiogram showed extensive fibrocaseous disease rt. 1, 2, 3. Two san. periods. Serial radiograms 1947, both lungs heavily involved; huge cavity rt. upper lobe; small cavity 3rd lt. interspace. In hospital Oct. 17, 1947. Sulphetrone objective: clear infiltration and make fit for rt. thoracoplasty	670	100	7–11	Gain	30/5 (W)	+/+	Definite clearing of bilateral exudation. Cavity rt. upper lobe smaller. Almost ready for thoracoplasty	Improved
M 49	Chronic bilateral fibrocaseous disease; radiogram (Oct. 9, 1947) showed rt. upper ¹/₃ infiltrated, with cavitation; lt. upper lobe productive infiltration. Unsuitable for minor active measures. Sulphetrone objective: make fit for rt. thoracoplasty	605	108	6–7·5	Gain	13/3 (W)	+/−	Much clearing of exudative lesions. Ready for rt. thoracoplasty	Improved
M 39	Neglected hæmoptyses 1945 and June, 1946. Radiogram showed bilateral chronic fibrocaseous disease of rt. upper lobe with cavitation; rest of both lungs infiltrated. Tuberculous laryngitis. Ischiorectal abscess, with spread of ulceration to perianal region and most of left buttock. Condition serious	1052	223	8	Gain	85/2 (W)	+/−	Larynx improved. Infiltration in both lungs much reduced. No cavitation now in rt. upper lobe. Lt. lung quiescent. Ready for rt. thoracoplasty. Ischiorectal abscess and buttock ulceration healed	Much improved
M 38	Chronic bilateral fibrocaseous disease 6 yr. Radiogram (April 29, 1945) showed productive infiltration creeping towards bases; sulphetrone in O.P. to arrest spread	1133	329	2–5	Gain	13/11 (C)	+/+	Infiltration in both lungs reduced. Basal spread halted but cavities not closed	Improved
F 28	In hospital April 22, 1946. Grave constitutional disturbance. Radiogram showed moderate rt. pleural effusion and patchy tuberculous bronchopneumonia both lungs	727	178	5	Gain	15/4 (C)	+/−	Sulphetrone reduced patchy infiltration	Improved
M 18	In hospital Feb. 12, 1943. Grave constitutional disturbance. Very large peritoneal effusion. Large rt. pleural effusion. Cardiovascular and renal tract normal. Opinions favoured tuberculosis	350	40	3–6	Gain	31/10 (W)	Nil	Favourable progress. Discharged July 1, 1943	Much improved
M 30	Pleural effusion 1927. Tuberculous rt. knee-joint 1928. Bilateral tuberculous kidneys 1944. Several periods in institution	.. ..	(i) 300 (ii) 90	2–3 2·5	Gain	0/4 (W)	+/±‡	Lt. nephrectomy July, 1947. Gross destructive lesions present	No change
M 19	In hospital Sept. 13, 1945. Recently healed lesion in vertebræ L2, L3; active and severe caries of D8–10. Large rt. paravertebral abscess. Large pure chylous pleural effusion. Moderate pericardial effusion. Poor general condition with constitutional disturbance for several mos. after admission	774	182	1–4	Gain	25/4 (C)	+/−	Sulphetrone, later combined with 3 mos. streptomycin, changed outlook. Temperature began to settle; E.S.R. quickly fell; patient, so long unresponsive, began to improve. Discharged with lesions quiescent. Now well	Much improved

* Gastric lavage negative. † Three interrupted courses of sulphetrone, each lasting 6 months, between December, 1943, and April, 1946.

)rganisms reduced from very many to very few. O.P. = Outpatient. A.P. = Artificial pneumothorax. P.P. = Pneumoperitoneum.

considerably, E.S.R. was 3 mm. (Westergren), with much general improvement, quiescence followed, and the patient was discharged in excellent condition twenty weeks later.

Group II : Primary Pulmonary Disease.—In 3 cases of mediastinal glands causing segmental or lobar collapse there was improvement without rapid re-expansion of atelectasis. A case of primary cavitation of the right lower lobe showed early resolution of surrounding infiltration, with cavity closure and sputum conversion.

Group III : Strictly Exudative Pulmonary Lesions.—Of 8 patients in this category 3 were outpatients; 7 improved, with decreased infiltration, fibrosed lesions, and earlier calcification than anticipated. Sputum conversion resulted in all cases (3) originally positive. Of 2 patients with fresh bilateral exudative infiltration superimposed on old fibrotic lesions 1 presented with an acute attack, with extensive parenchymatous exudation. In spite of a large series of positive sputa, twelve months' sulphetrone therapy (six as outpatient) cleared the infiltration completely, with sputum conversion which remains negative on culture during a two-year follow-up.

Group IV : Chronic Bilateral Pulmonary Hæmatogenous Disease.—Of 4 cases (2 in outpatients) definite clearing was observed in all. Recrudescence was observed in 3, from eighteen to twenty-four months after withdrawal of sulphetrone, and in 2 the condition is characterised by the appearance of a small apical cavity. Thus the pattern of the relapse conforms to fibrocaseous disease.

Group V : Strictly Productive Pulmonary Infiltration.—Of 4 cases treated as outpatients 3 improved. In the patient showing no change the blood-sulphetrone level did not exceed 1 mg. per 100 ml.

Group VI A : Acute Pulmonary Fibrocaseous Disease.—Six patients who were gravely ill presented with acute bilateral fibrocaseous disease complicated by a progressive tuberculous bronchopneumonia. In all of them the additional load on an already taxed resistance warranted a very bad prognosis. In 2 patients the extensive infiltrative processes gradually but completely resolved, and in 1 the bronchopneumonic foci completely calcified. The soft extensive lesions of a third patient hardened, and the final radiological picture was that of chronic fibrocaseous disease. So seriously ill and with so extensive an involvement of both lungs were the 3 remaining patients that the immediate prognosis was grave and benefit from sulphetrone was not to be expected.

Five seriously ill patients presented with acute unilateral fibrocaseous disease and rapidly progressive contralateral exudative infiltration. In 2 of them this latter condition had developed within three weeks. In all 5 cases the extent of the disease, the acuteness of the condition, and the toxicity of the patient strongly contra-indicated immediate surgical intervention. Without exception the exudative process was not only halted but also began to regress as soon as sulphetrone therapy was established. In 3 cases collapse of the more affected lung became possible with ultimate control of the lesion, no intervention being necessary on the other side.

Three severely ill patients presented with acute unilateral fibrocaseous disease without evidence of contralateral involvement. One of these, who died before a therapeutic blood-sulphetrone level was reached, is discussed below. The second improved considerably. The third, a repatriated prisoner-of-war who experienced the Thailand railway ordeal, was very ill on admission. Sulphetrone controlled his toxic manifestations. After a combined second course of sulphetrone and streptomycin a change from acute to chronic disease ensued. Numerous negative sputum cultures were obtained, there was radiological evidence that the cavity had closed, and quiescence was presumed. Four months after his discharge the cavity had reopened and his sputum again contained tubercle bacilli. Control was regained by performing an artificial pneumothorax.

Group VI B : Chronic Pulmonary Fibrocaseous Disease.—Of 20 patients, improvement was recorded in 13, of whom 8 were outpatients.

One man, aged 39, had chronic fibrocaseous disease of the right lung, productive infiltration in the upper half of the left lung, early tuberculosis of the larynx, and an ischiorectal abscess complicated by gross perianal ulceration with extension to most of the left buttock. The prognosis was bad. Sulphetrone therapy led to healing of the perianal ulceration and ischiorectal abscess. The sputum became negative on culture, and the E.S.R. fell from 85 to 2 mm. (Westergren). There was much clearing of tuberculous infiltration and reduction of the cavity in the right lung; and the disease became quiescent in the left lung. The larynx practically healed and the patient was fit to undergo a right-sided two-stage thoracoplasty.

Another patient had had bilateral pulmonary tuberculosis since 1941. All the lobes of the right lung were infiltrated and there was a massive apical cavity. Both lobes of the left lung were infiltrated, and there was a small cavity at the level of the third interspace. There was well-marked clearing of the bilateral exudative infiltration in ten weeks, the apical cavity was reduced in size, and the E.S.R. fell from 30 to 5 mm. The patient was fit to undergo right thoracoplasty three months after the start of sulphetrone therapy.

A third patient was a man, aged 49, with bilateral fibrocaseous tuberculosis of the upper lobes and cavitation of the right apex. After four months' sulphetrone therapy the infiltration was clearing and the left apical disease was controlled. The patient underwent a successful right-sided thoracoplasty on July 7, 1948.

A fourth patient was a man, aged 28, with a cavity in the right upper lobe, hæmoptysis, and an extensive bronchogenic spread to all lobes of both lungs. After the induction of an artificial pneumoperitoneum on May 22, 1947, the lesion became slightly smaller, but the exhibition of sulphetrone, begun on Oct. 1, brought about definite clearing of the patchy infiltration.

A fifth patient was a man, aged 38, with bilateral chronic fibrocaseous pulmonary tuberculosis since 1940, which had begun to spread to the bases in 1945. Sulphetrone was prescribed for him as an outpatient for 329 days. The basal extension stopped and hardened, and infiltration in both lungs was much reduced.

Of the 7 patients who did not respond 3 had very advanced disease, in a fourth patient a resistant strain of tubercle bacilli had developed after the use of streptomycin, and the 3 others were outpatients whose blood-sulphetrone was not raised to the optimal therapeutic level owing to their poor nutrition.

Group VII : Bronchopneumonic.—One improved case is reported in table II; the second was one of bilateral bronchopneumonia in a woman, aged 29, whose condition remained unchanged after a six-month course of sulphetrone.

Group VIII : Serous Effusion.—A boy, aged 13, had been ill for three weeks before admission on Feb. 15, 1943. Gross constitutional disturbance; temperature 100–104°F, large right pleural and peritoneal effusions, which were clear, predominantly lymphocytic, and sterile. Mantoux test positive. No organisms isolated, but a consensus of several opinions favoured a diagnosis of tuberculosis. The patient made good progress and was discharged in good condition on July 1, 1943.

Group IX : Urogenital.—In one uncomplicated case tubercle bacilli were isolated from both kidneys by ureteric catheterisation. Intravenous pyelography indicated marked damage in the left kidney. Two courses of sulphetrone were given. The number of organisms was much reduced during the first course. Later radiograms showed calcification of the left kidney. The patient underwent left nephrectomy in July, 1947, and is now well. The second patient had tuberculosis of the upper pole of the left epididymis. The swelling continued to enlarge but slowly subsided after three months' sulphetrone therapy. This patient also had fibrocaseous pulmonary tuberculosis.

Group X : Skeletal.—The single case had recently healed caries of L2 and L3 and gross caries of D8–10, a large paravertebral abscess, and an effusion of pure chyle in the right pleural cavity. The condition had been static for a long time before sulphetrone was given. The first achievement was the reduction of the E.S.R., which had been high for months. Reduction of the paravertebral abscess, bony regeneration in rarefied vertebræ, and general improvement followed in due course. The patient remains well fifteen months after discharge.

TOXICITY

The part played by iron and yeast in treating anæmia of diverse origin caused by sulphetrone and the fact that polyneuritis is avoided by the administration of yeast ve already been mentioned. A residual effect is a emolytic anæmia due to sulphetrone, and a compen- tory reticulocytosis of as much as 10% may be present Brownlee 1948).

Minor inconvenience due to the physiological adjust- ent which the increase in alkali reserve calls forth is served during the first three weeks while blood- lphetrone levels are being built up, and it has been ted that the bicarbonate ion provides relief.

Major intoxication is observed when blood-sulphetrone vels in excess of 12·5 mg. per 100 ml. are allowed to rsist for several days. The onset of symptoms appears be related to the patient's nutrition, and in particular the reserves of B-complex vitamins. The ultimate hology is anoxia, first reflected in a diminished acity of the red cells to transport oxygen; the mical state of the hæmoglobin may or may not be ected, and methæmoglobinæmia is not a constant ture, being observed only terminally. This insidious icity was observed in 1 patient with extensive lateral fibrocaseous disease, of low vital capacity, l acutely ill, before the therapeutic value of yeast l been appreciated. Constipation for several days owed a reservoir of unabsorbed sulphetrone to accumu- e in a static gut, with the result that a blood-sulphe- ne level of 17·5–20 mg. per 100 ml. was maintained about six days with fatal consequences.

Sulphetrone has no toxic effect on white cells or their duction. In the only instance observed, granulo- topenia responded to folic acid; it recurred on administration of sulphetrone and again responded to lic acid. Sulphetrone was then discontinued. The ficiency state in this case was considered to be of tritional origin.

Abnormal Blood Pigments.—So rarely were these countered, though systematically sought, that for actical purposes they are not rated as a risk. They have en described by Brownlee (1948).

DISCUSSION

The difficulty of assessing the results of chemotherapy tuberculosis, due to its unpredictable course and to the hical considerations already mentioned, has not been solved in the present series of 70 observations spread ver five years.

Various periods of continuous sulphetrone therapy are cluded in the present series; from three to six months common, and from six to nine months usual. Several atients had continuous sulphetrone therapy for twelve onths, and 2, with average blood-sulphetrone levels of mg. per 100 ml., for eighteen months. The simultaneous xhibition of iron and yeast prevented the onset of næmia of hypochromic and nutritional origin.

It is in the cases which improved that difficulty of terpretation arises. Included in assessment are all vailable data, such as changes in E.S.R., sputum con- ersion, other relevant bacteriology, and changes in eneral health and in weight, together with the radio- gical evidence. As a general overriding consideration here is the question of whether the target set was reached. n allocating credit there is the need, on the negative de, to discount the positive effects of ancillary hospital herapy, and, on the positive side, for conservative linical judgment because of the variation in the expected athological picture induced by chemotherapy.

In general, sulphetrone therapy effectively combated filtrative exudative lesions wherever these were bserved. The radiological changes were accompanied y improvement of general condition, control of fever, nd reduced E.S.R. Falls in E.S.R. are characteristically recipitous; so much so that alternative explanations ave been sought but not found. Improvements in xudative disease have been greatest in pulmonary fibrocaseous disease, a fact which I have associated with evidence of host-resistance. The capacity of chemo- therapy to resolve infiltration of this kind had so impressed me by the second phase of the trial that it gave rise to the conception of "objectives" or "targets" in an adjuvant sense. It is in this capacity that sulphone therapy seems likely to be most useful.

The protracted nature of chemotherapy of tuberculosis should be emphasised, periods of observation being measured in units of three months. The necessity for a scheme of management and for laboratory control has already been mentioned. Provided blood-sulphetrone levels above 10 mg. per 100 ml. are not exceeded, only minor toxic signs will be met. Should blood-sulphetrone levels above 12·5 mg. be persisted in, major disasters can confidently be predicted. Nevertheless sulphetrone therapy of tuberculosis can play a useful part, as a well-defined adjuvant measure, in the control of exudative tuberculosis.

SUMMARY

In 70 cases of tuberculosis affecting different organs sulphetrone was given for periods which varied from a few days in tuberculous meningitis to eighteen months in more chronic cases.

Whether sulphetrone is given parenterally or by mouth, a gradual increase of dosage is necessary to build up therapeutic blood-sulphetrone levels of 7·5–10 mg. per 100 ml. if toxic symptoms are to be avoided.

It is also essential to give iron and brewers' yeast to avoid hypochromic and nutritional anæmia. Even so a residual hæmolytic anæmia will arise, leading to a fall in hæmoglobin concentration though not to below 60% (Haldane).

To avoid major toxic emergencies, seen when blood-sulphetrone levels above 12·5 mg. per 100 ml. are allowed to persist, a scheme of management is suggested.

In general no beneficial effect was detected from sulphetrone therapy of acute infections—e.g., acute miliary tuberculosis and tuberculous meningitis—but a patient with chronic miliary tuberculosis recovered. On the other hand, improvement was observed in chronic lesions. Thus 12 out of 17 cases of acute pulmonary fibrocaseous disease, and 13 out of 22 chronic cases, improved. All of 4 cases of primary pulmonary tuberculosis, and 6 out of 8 strictly exudative lesions, improved. In the chronic hæmatogenous group all of 4 cases improved, and in the productive pulmonary infiltrative group 3 out of 4 improved.

In general, all exudative phases of infiltrative disease were halted and reversed by sulphetrone.

The need for long-continued courses is emphasised, units of observation being three months, and routine laboratory control is essential.

Sulphetrone is useful as an adjuvant with definite objectives in view.

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considerably, E.S.R. was 3 mm. (Westergren), with much general improvement, quiescence followed, and the patient was discharged in excellent condition twenty weeks later.

Group II: Primary Pulmonary Disease.—In 3 cases of mediastinal glands causing segmental or lobar collapse there was improvement without rapid re-expansion of atelectasis. A case of primary cavitation of the right lower lobe showed early resolution of surrounding infiltration, with cavity closure and sputum conversion.

Group III: Strictly Exudative Pulmonary Lesions.—Of 8 patients in this category 3 were outpatients; 7 improved, with decreased infiltration, fibrosed lesions, and earlier calcification than anticipated. Sputum conversion resulted in all cases (3) originally positive. Of 2 patients with fresh bilateral exudative infiltration superimposed on old fibrotic lesions 1 presented with an acute attack, with extensive parenchymatous exudation. In spite of a large series of positive sputa, twelve months' sulphetrone therapy (six as outpatient) cleared the infiltration completely, with sputum conversion which remains negative on culture during a two-year follow-up.

Group IV: Chronic Bilateral Pulmonary Hæmatogenous Disease.—Of 4 cases (2 in outpatients) definite clearing was observed in all. Recrudescence was observed in 3, from eighteen to twenty-four months after withdrawal of sulphetrone, and in 2 the condition is characterised by the appearance of a small apical cavity. Thus the pattern of the relapse conforms to fibrocaseous disease.

Group V: Strictly Productive Pulmonary Infiltration.—Of 4 cases treated as outpatients 3 improved. In the patient showing no change the blood-sulphetrone level did not exceed 1 mg. per 100 ml.

Group VI A: Acute Pulmonary Fibrocaseous Disease.—Six patients who were gravely ill presented with acute bilateral fibrocaseous disease complicated by a progressive tuberculous bronchopneumonia. In all of them the additional load on an already taxed resistance warranted a very bad prognosis. In 2 patients the extensive infiltrative processes gradually but completely resolved, and in 1 the bronchopneumonic foci completely calcified. The soft extensive lesions of a third patient hardened, and the final radiological picture was that of chronic fibrocaseous disease. So seriously ill and with so extensive an involvement of both lungs were the 3 remaining patients that the immediate prognosis was grave and benefit from sulphetrone was not to be expected.

Five seriously ill patients presented with acute unilateral fibrocaseous disease and rapidly progressive contralateral exudative infiltration. In 2 of them this latter condition had developed within three weeks. In all 5 cases the extent of the disease, the acuteness of the condition, and the toxicity of the patient strongly contra-indicated immediate surgical intervention. Without exception the exudative process was not only halted but also began to regress as soon as sulphetrone therapy was established. In 3 cases collapse of the more affected lung became possible with ultimate control of the lesion, no intervention being necessary on the other side.

Three severely ill patients presented with acute unilateral fibrocaseous disease without evidence of contralateral involvement. One of these, who died before a therapeutic blood-sulphetrone level was reached, is discussed below. The second improved considerably. The third, a repatriated prisoner-of-war who experienced the Thailand railway ordeal, was very ill on admission. Sulphetrone controlled his toxic manifestations. After a combined second course of sulphetrone and streptomycin a change from acute to chronic disease ensued. Numerous negative sputum cultures were obtained, there was radiological evidence that the cavity had closed, and quiescence was presumed. Four months after his discharge the cavity had reopened and his sputum again contained tubercle bacilli. Control was regained by performing an artificial pneumothorax.

Group VI B: Chronic Pulmonary Fibrocaseous Disease.—Of 20 patients, improvement was recorded in 13, of whom 8 were outpatients.

One man, aged 39, had chronic fibrocaseous disease of the right lung, productive infiltration in the upper half of the left lung, early tuberculosis of the larynx, and an ischiorectal abscess complicated by gross perianal ulceration with extension to most of the left buttock. The prognosis was bad. Sulphetrone therapy led to healing of the perianal ulceration and ischiorectal abscess. The sputum became negative on culture, and the E.S.R. fell from 85 to 2 mm. (Westergren). Th was much clearing of tuberculous infiltration and reduc of the cavity in the right lung; and the disease beca quiescent in the left lung. The larynx practically hea and the patient was fit to undergo a right-sided two-st thoracoplasty.

Another patient had had bilateral pulmonary tubercul since 1941. All the lobes of the right lung were infiltra and there was a massive apical cavity. Both lobes of the l lung were infiltrated, and there was a small cavity at the l of the third interspace. There was well-marked clearin the bilateral exudative infiltration in ten weeks, the ap cavity was reduced in size, and the E.S.R. fell from 36 to 5 m The patient was fit to undergo right thoracoplasty th months after the start of sulphetrone therapy.

A third patient was a man, aged 49, with bilateral fib caseous tuberculosis of the upper lobes and cavitation of t right apex. After four months' sulphetrone therapy the in tration was clearing and the left apical disease was control The patient underwent a successful right-sided thoracopl on July 7, 1948.

A fourth patient was a man, aged 28, with a cavity in t right upper lobe, hæmoptysis, and an extensive bronchogen spread to all lobes of both lungs. After the induction of a artificial pneumoperitoneum on May 22, 1947, the le became slightly smaller, but the exhibition of sulphetrone begun on Oct. 1, brought about definite clearing of th patchy infiltration.

A fifth patient was a man, aged 38, with bilateral chronic fibrocaseous pulmonary tuberculosis since 1940, which had begun to spread to the bases in 1945. Sulphetrone was prescribed for him as an outpatient for 329 days. The basal extension stopped and hardened, and infiltration in both lungs was much reduced.

Of the 7 patients who did not respond 3 had very advanced disease, in a fourth patient a resistant strain of tubercle bacilli had developed after the use of streptomycin, and the 3 others were outpatients whose blood-sulphetrone was n raised to the optimal therapeutic level owing to their p nutrition.

Group VII: Bronchopneumonic.—One improved cas reported in table II; the second was one of bilateral bronchopneumonia in a woman, aged 29, wh condition remained unchanged after a six-month course of sulphetrone.

Group VIII: Serous Effusion.—A boy, aged 13, had bee ill for three weeks before admission on Feb. 15, 1943. Gro constitutional disturbance; temperature 100–104°F, lar right pleural and peritoneal effusions, which were cle predominantly lymphocytic, and sterile. Mantoux te positive. No organisms isolated, but a consensus of sever opinions favoured a diagnosis of tuberculosis. The patie made good progress and was discharged in good conditi on July 1, 1943.

Group IX: Urogenital.—In one uncomplicated ca tubercle bacilli were isolated from both kidneys by ureter catheterisation. Intravenous pyelography indicated mo damage in the left kidney. Two courses of sulphetrone we given. The number of organisms was much reduced during th first course. Later radiograms showed calcification of the l kidney. The patient underwent left nephrectomy in J 1947, and is now well. The second patient had tubercu of the upper pole of the left epididymis. The swelling cont to enlarge but slowly subsided after three months' sul trone therapy. This patient also had fibrocaseous pulmo tuberculosis.

Group X: Skeletal.—The single case had recently be caries of L2 and L3 and gross caries of D8–10, a large p vertebral abscess, and an effusion of pure chyle in the r pleural cavity. The condition had been static for a long t before sulphetrone was given. The first achievement was th reduction of the E.S.R., which had been high for month Reduction of the paravertebral abscess, bony regenerat in rarefied vertebræ, and general improvement followed i due course. The patient remains well fifteen months af discharge.

TOXICITY

The part played by iron and yeast in treating anæmi of diverse origin caused by sulphetrone and the fact th polyneuritis is avoided by the administration of yea ve already been mentioned. A residual effect is a emolytic anæmia due to sulphetrone, and a compen-tory reticulocytosis of as much as 10% may be present Brownlee 1948).

Minor inconvenience due to the physiological adjust-ent which the increase in alkali reserve calls forth is served during the first three weeks while blood-lphetrone levels are being built up, and it has been ted that the bicarbonate ion provides relief.

Major intoxication is observed when blood-sulphetrone vels in excess of 12·5 mg. per 100 ml. are allowed to rsist for several days. The onset of symptoms appears be related to the patient's nutrition, and in particular the reserves of B-complex vitamins. The ultimate thology is anoxia, first reflected in a diminished pacity of the red cells to transport oxygen; the emical state of the hæmoglobin may or may not be fected, and methæmoglobinæmia is not a constant ature, being observed only terminally. This insidious xicity was observed in 1 patient with extensive ilateral fibrocaseous disease, of low vital capacity, d acutely ill, before the therapeutic value of yeast d been appreciated. Constipation for several days lowed a reservoir of unabsorbed sulphetrone to accumu-te in a static gut, with the result that a blood-sulphe-one level of 17·5–20 mg. per 100 ml. was maintained r about six days with fatal consequences.

Sulphetrone has no toxic effect on white cells or their oduction. In the only instance observed, granulo-topenia responded to folic acid: it recurred on administration of sulphetrone and again responded to lic acid. Sulphetrone was then discontinued. The eficiency state in this case was considered to be of tritional origin.

Abnormal Blood Pigments.—So rarely were these countered, though systematically sought, that for ractical purposes they are not rated as a risk. They have een described by Brownlee (1948).

DISCUSSION

The difficulty of assessing the results of chemotherapy tuberculosis, due to its unpredictable course and to the hical considerations already mentioned, has not been solved in the present series of 70 observations spread ver five years.

Various periods of continuous sulphetrone therapy are cluded in the present series; from three to six months common, and from six to nine months usual. Several atients had continuous sulphetrone therapy for twelve onths, and 2, with average blood-sulphetrone levels of mg. per 100 ml., for eighteen months. The simultaneous xhibition of iron and yeast prevented the onset of næmia of hypochromic and nutritional origin.

It is in the cases which improved that difficulty of terpretation arises. Included in assessment are all vailable data, such as changes in E.S.R., sputum con-ersion, other relevant bacteriology, and changes in eneral health and in weight, together with the radio-gical evidence. As a general overriding consideration here is the question of whether the target set was reached. n allocating credit there is the need, on the negative de, to discount the positive effects of ancillary hospital herapy, and, on the positive side, for conservative linical judgment because of the variation in the expected athological picture induced by chemotherapy.

In general, sulphetrone therapy effectively combated filtrative exudative lesions wherever these were bserved. The radiological changes were accompanied y improvement of general condition, control of fever, nd reduced E.S.R. Falls in E.S.R. are characteristically recipitous; so much so that alternative explanations ave been sought but not found. Improvements in xudative disease have been greatest in pulmonary fibrocaseous disease, a fact which I have associated with evidence of host-resistance. The capacity of chemotherapy to resolve infiltration of this kind had so impressed me by the second phase of the trial that it gave rise to the conception of "objectives" or "targets" in an adjuvant sense. It is in this capacity that sulphone therapy seems likely to be most useful.

The protracted nature of chemotherapy of tuberculosis should be emphasised, periods of observation being measured in units of three months. The necessity for a scheme of management and for laboratory control has already been mentioned. Provided blood-sulphetrone levels above 10 mg. per 100 ml. are not exceeded, only minor toxic signs will be met. Should blood-sulphetrone levels above 12·5 mg. be persisted in, major disasters can confidently be predicted. Nevertheless sulphetrone therapy of tuberculosis can play a useful part, as a well-defined adjuvant measure, in the control of exudative tuberculosis.

SUMMARY

In 70 cases of tuberculosis affecting different organs sulphetrone was given for periods which varied from a few days in tuberculous meningitis to eighteen months in more chronic cases.

Whether sulphetrone is given parenterally or by mouth, a gradual increase of dosage is necessary to build up therapeutic blood-sulphetrone levels of 7·5–10 mg. per 100 ml. if toxic symptoms are to be avoided.

It is also essential to give iron and brewers' yeast to avoid hypochromic and nutritional anæmia. Even so a residual hæmolytic anæmia will arise, leading to a fall in hæmoglobin concentration though not to below 60% (Haldane).

To avoid major toxic emergencies, seen when blood-sulphetrone levels above 12·5 mg. per 100 ml. are allowed to persist, a scheme of management is suggested.

In general no beneficial effect was detected from sulphetrone therapy of acute infections—e.g., acute miliary tuberculosis and tuberculous meningitis—but a patient with chronic miliary tuberculosis recovered. On the other hand, improvement was observed in chronic lesions. Thus 12 out of 17 cases of acute pulmonary fibrocaseous disease, and 13 out of 22 chronic cases, improved. All of 4 cases of primary pulmonary tuberculosis, and 6 out of 8 strictly exudative lesions, improved. In the chronic hæmatogenous group all of 4 cases improved, and in the productive pulmonary infiltrative group 3 out of 4 improved.

In general, all exudative phases of infiltrative disease were halted and reversed by sulphetrone.

The need for long-continued courses is emphasised, units of observation being three months, and routine laboratory control is essential.

Sulphetrone is useful as an adjuvant with definite objectives in view.

I wish to thank the Wellcome Foundation Ltd. for supplying sulphetrone; the Wellcome Physiological Research Laboratories, Beckenham, for establishing close laboratory liaison through Dr. G. Brownlee, and for giving unlimited aid at all times; the hospital pathological laboratory for coöperation of the highest order; Dr. J. F. Hackwood, medical superintendent, for encouragement; and the nurses under Sister Clancy, without whom the trial could not have been carried through.

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a day, provided that facilities are available for the estimation of blood-sulphetrone levels, hæmoglobin percentage, and red-cell and white-cell counts. The blood-level should not exceed 12 mg. per 100 ml. Iron and yeast should also be given to prevent a fall in the hæmoglobin level.

Further trials with sulphetrone in selected cases are warranted.

SUMMARY

Sulphetrone was given to 57 patients with tuberculosis. Only 44 of these cases, 42 of which were pulmonary, were treated long enough for the results to be assessed.

Improvement was noted in 22, 5 were unchanged, 6 became worse, and 11 died. Of those who improved, 9 improved considerably, 7 moderately, and 6 slightly. Improvement was not dramatic, and at best sulphetrone can only be regarded as an adjuvant and not in any way as a specific for tuberculosis.

Sulphetrone produced toxic side-effects (nausea, vomiting, anorexia, headache, depression, drug rash, and disturbances of vision) in 6 out of 57 patients. These effects disappeared on the withdrawal of the drug.

Sulphetrone lowers the hæmoglobin level, but this can be corrected by iron and yeast.

Sulphetrone should be used only if there are facilities for estimating blood-sulphetrone levels and for carrying out blood-counts.

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RADICAL CURE OF INGUINAL HERNIA WITH A PLASTIC INSERT

WALTER THOMPSON
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RESIDENT SURGICAL OFFICER, MANCHESTER ROYAL INFIRMARY

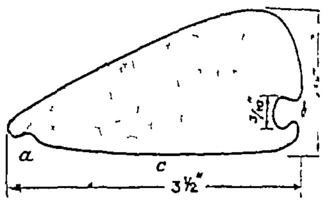
IN 1909 McGavin published his operation for the cure of inguinal hernia with double filigree inserts, and the operation was reviewed by Cole (1941). The attention of surgeons was directed to the excellent results. This paper is intended to introduce a new operation using plastic material instead of the silver filigree wires, and the operation is based on McGavin's.

Messrs. Portland Plastics Ltd., of London, kindly supplied me with plastic sheeting $^1/_{16}$ *in. thick made of poly-ethylene—formula* CH_2 (*n* times). This material was thought, from its chemical composition, to be completely inert in the body. Only small amounts of plasticisers are used in its manufacture. It can be produced in various grades of hardness, depending on the degree of polymerisation. Grade 200 was chosen, since it is flexible and can be easily cut with scissors, yet is firm enough, when $^1/_{16}$ in. thick, to withstand the normal muscular strains of the body without bending. *Poly-ethylene can also be easily sterilised by boiling.*

OPERATION

The routine inguinal incision is used; and, after division of the external oblique aponeurosis, the cord, conjoint tendon, and iliohypogastric and ilio-inguinal nerves are defined. The cremaster muscle, along with the inguinal nerve, both in front and behind the cord, is separated and removed. The cremasteric vessels are ligated and divided at their origin from the deep epigastric vessels. The sac is then dissected free and dealt with in the usual manner.

The transversalis fascia is next incised below the arching fibres of the transversalis muscle and the conjoint tendon, exposing the extraperitoneal fat. The peritoneum is then dissected clear from the poster aspect of the muscles of the abdominal wall, upwa inwards, and outwards for $1^1/_2$ in. This is an essen step of the operation and provides the bed in which the plastic insert lies. It is usually not necessary to div the deep epigastric vessels, for these can be carried w *the peritoneum* away from the abdominal musculature.



Poly-ethylene insert for inguinal hernia: notch for pubic spine; (b) notch for sper matic cord and vessels; (c) slightly curv lower border.

The poly-ethylene sheeting is next taken from the steriliser and cut with scissors to fit in the bed so formed. The size and shape in an average case are as in the accompanying figure. The edges are bevelled with an scalpel before insertion. The vas and vessels will ha previously been dissected free from the floor of the iliac fossa and from the neck of the sac when the latter structure was dissected free. The vas and vesse are now placed in the niche provided in the plastic insert and this is slipped in a lateral direction *under the free* arching fibres of the internal oblique and transversalis muscles. The lower edge comes to lie along Poupart's ligament, and the medial acute angle is pushed behind the insertion of the rectus abdominis muscles into the pubic spine.

A medium-sized nylon suture is then taken, and the lower edge *of the plastic insert* is perforated with Mayo's needle and stitched with interrupted sut to Poupart's ligament. The first essential stitch is one which perforates the plastic sheeting at its angle and encircles Poupart's ligament as it is in into the pubic spine. The other essential stitch fix the edge of the plastic sheeting to Poupart's ligam *opposite the origin of the fibres of the internal obli* muscle.

The cord lies in front of the plastic sheet; the internal ring and the deep epigastric vessels, the ext peritoneal fat, and the peritoneum, and the lower fi of the transversalis fascia come to lie behind the pla insert. The new internal ring is thus displaced outwar and upwards 1 in. and comes to lie directly behind the strong arching fibres of the transversalis and inter oblique muscles. The conjoint tendon is next sutu to Poupart's ligament in front of the plastic sheet and behind the cord by a running catgut stitch. T external oblique and the skin are sutured in the ortho manner.

ANÆSTHESIA AND POSTOPERATIVE TREATMENT

The routine form of anæsthesia used is 'Spin Amethocaine' 1%, dextrose 6·3% (Duncan, Flockhart Co.) and has been found to be very satisfactory, spinal headaches have ensued. Local anæsthes been used on four patients, owing to their condition; two of them were over 80 years of age.

The patient is instructed in breathing exer immediately on return to the ward, and next day takes part in the routine ward exercises. These gradually increased in range, and he is allowed up the ninth day. Owing to pressure on beds patients been discharged home on the tenth postoperative by ambulance. They are instructed to get up increasing periods during the next fortnight. The patients have been got up on the second day, and period has been gradually increased day by day they are up and dressed for most of the day by the postoperative day.

INDICATIONS AND RESULTS

atients have been chosen for this operation who ld normally have had a fascial graft. The youngest aged 35 years and the oldest 84.

iis operation has been performed on more than ity patients since August, 1946. All the wounds ed by first intention except in one patient who loped a subcutaneous hæmatoma, which required ation. One patient required a course of penicillin sulphamezathine for a moderately serious chest ition. These patients have been carefully watched h by month at the routine follow-up clinic. No rences have been observed, and there appears to ery little fibrous-tissue reaction round the plates, h can be palpated easily. The patients seem to complained of less pain after this operation than a Gallic fascial graft. However, the intelligent say they can feel a resistance in the inguinal region ending to fasten their shoes. Plastic inserts have been used with success in umbilical herniæ.

SUMMARY

new method of curing inguinal hernia is described h is based on the filigree operation of McGavin 9). Plastic inserts of poly-ethylene are used instead lver filigree.

ie results in twenty cases are reviewed.

is work has been carried out under the direction of A. Graham Bryce, surgeon at the Manchester Royal mary, whom I would like to thank for his stimulation advice. Very satisfactory samples of 'Polythene' sheet were kindly supplied by Imperial Chemical Industries , to whom I am also grateful for chemical details.

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HANDKERCHIEFS IN THE TRANSFER OF RESPIRATORY INFECTION

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HE rôle of the handkerchief in the spread of upper iratory infections has probably had less attention i it deserves. Hare (1941) demonstrated hæmolytic ptococci in the handkerchiefs of carriers of these nisms as well as in the bedding and dust of their ns, and his observations were confirmed by Hamger et al. (1944). Nose-blowing as a means of aminating the hands and environment with hæmo- streptococci has been investigated by Hamburger Green (1946).

he handkerchief collects both nasal and oral secretions, droplets of the latter escape also during sneezing rdillon et al. 1941) and in coughing (Duguid 1946a b, Hare and Mackenzie 1946). It is possible that l secretions are distributed predominantly by the lkerchief, but for this to happen efficiently the lkerchief must be dry (Willits and Hare 1941).

iese and other observations suggested to us that an nate of the numbers of potentially infective particles ated by the shaking of dry handkerchiefs would a useful preliminary to a study of some of the ors concerned in the transfer of respiratory infection person to person. The actual mechanism operating ich disease has to be studied on its own merits, but possibilities inherent in different routes may be ged by the total numbers of particles which may be lved in each. The experiments reported in this er were made to determine the numbers of bacteria-carrying particles which could be shaken from used handkerchiefs, and the reaction of these particles to aerial disinfectants.

NUMBERS OF PARTICLES DETACHABLE FROM HANDKERCHIEFS BY SHAKING

Volunteers for the common cold research programme arrive at this unit at the rate of two dozen every second week, and careful records are kept of their nasal condition. Some develop colds during their stay and illustrate varying degrees and types of nasal secretion. For these reasons they formed an admirable population for the proposed handkerchief study.

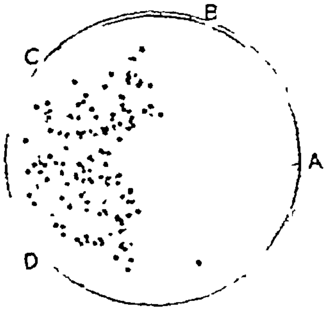

Fig. 1—A typical slit-sampler plate from a $^{1}/_{2}$ min. shaking of a used handkerchief. A, B, C, D, mark first three $^{1}/_{2}$ min. sectors of plate. AB is the background sector. Shaking began at B and continued till C. Sectors AB and CD were counted, and count of particles shaken from the handkerchief was found by subtracting AB from CD.

Method

Our handkerchiefs were of Egyptian cotton parachute material and were about 1 ft. square. They were issued sterile to volunteers and collected again after two days' use. They were allowed to dry overnight at 70°F in a quiet dust-free room, and next day were shaken one at a time by being held in the air stream of a $^{1}/_{2}$ h.p. blower. The shaking was done in a small airtight room of 400 cu. ft. capacity, with walls of washable concrete. The floor was kept wet with calcium chloride solution to prevent raising of dust by the air stream of the blower. The room was so arranged that, after the handkerchief had been fixed in front of the blower, all subsequent operations could be controlled from outside. A more detailed description of this room will be given in a subsequent paper.

The suspended particles were sampled immediately by a slit sampler (Bourdillon et al. 1941) on to nutrient agar plates enriched by 5% of horse serum. The routine procedure was first to fix the handkerchief in front of the blower. The room was then ventilated by an exhaust fan for 2 min., which sufficed for twenty air changes. After this the room was closed and a 2 cu. ft. sample of air taken over a period of 2 min. For the first $^{1}/_{2}$ min. the "background" air alone was sampled; then, during the whole of the second $^{1}/_{2}$ min., the blower was switched on and the handkerchief was violently shaken. Sampling was continued for the full minute after this. Plates were incubated for 24 hours at 37°C and colony counts made on the $^{1}/_{2}$ min. background sector (fig. 1) and the $^{1}/_{2}$ min. sector immediately following the cessation of shaking.

Filtered air was blown into the room, creating a slight positive pressure which prevented any leakage of external air into the room during the experiment. Serum-agar plates were also exposed at different sites within the room to collect samples of particles large enough to settle almost immediately, but the slit sampler collected efficiently particles of all sizes which would remain airborne during the experiment.

Results

A series of tests was made to determine the efficiency of the shaking technique. In these, handkerchiefs were shaken for 6 min. with continuous sampling. Counts on these showed that about half the total number of particles removable by shaking were extracted in the first $^{1}/_{2}$ min.

a day, provided that facilities are available for the estimation of blood-sulphetrone levels, hæmoglobin percentage, and red-cell and white-cell counts. The blood-level should not exceed 12 mg. per 100 ml. Iron and yeast should also be given to prevent a fall in the hæmoglobin level.

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OPERATION

The routine inguinal incision is used; and, after division of the external oblique aponeurosis, the cord, conjoint tendon, and iliohypogastric and ilio-inguinal nerves are defined. The cremaster muscle, along with the inguinal nerve, both in front and behind the cord, is separated and removed. The cremasteric vessels are ligated and divided at their origin from the deep epigastric vessels. The sac is then dissected free and dealt with in the usual manner.

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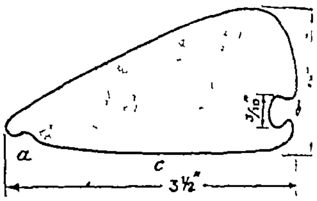


Poly-ethylene insert for inguinal hernia (notch for pubic spine; (b) notch for sp matic cord and vessels; (c) slightly cur lower border.

The poly-ethylene sheeting is next taken from the steriliser and cut with scissors to fit in the bed so formed. The size and shape in an average case are as in the accompanying figure. The edges are bevelled with an scalpel before insertion. The vas and vessels will ha previously been dissected free from the floor of th iliac fossa and from the neck of the sac when th latter structure was dissected free. The vas and vess are now placed in the niche provided in the plastic insert and this is slipped in a lateral direction under the free arching fibres of the internal oblique and transversalis muscles. The lower edge comes to lie along Poupart's ligament, and the medial acute angle is pushed behind the insertion of the rectus abdominis muscles into th pubic spine.

A medium-sized nylon suture is then taken, and th lower edge of the plastic insert is perforated wit Mayo's needle and stitched with interrupted st to Poupart's ligament. The first essential stitch is one which perforates the plastic sheeting at its angle and encircles Poupart's ligament as it is in into the pubic spine. The other essential stitch the edge of the plastic sheeting to Poupart's liga opposite the origin of the fibres of the internal obl muscle.

The cord lies in front of the plastic sheet; the internal ring and the deep epigastric vessels, the ext peritoneal fat, and the peritoneum, and the lower of the transversalis fascia come to lie behind the pl insert. The new internal ring is thus displaced outw and upwards 1 in. and comes to lie directly behind th strong arching fibres of the transversalis and inter oblique muscles. The conjoint tendon is next sutu to Poupart's ligament in front of the plastic sheet and behind the cord by a running catgut stitch. T external oblique and the skin are sutured in the ortho manner.

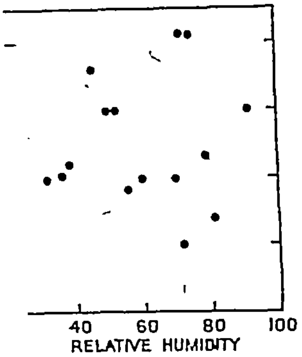
ANÆSTHESIA AND POSTOPERATIVE TREATMEN

The routine form of anæsthesia used is 'Spi Amethocaine' 1%, dextrose 6·3% (Duncan, Flock Co.) and has been found to be very satisfactory spinal headaches have ensued. Local anæsthe been used on four patients, owing to their g condition; two of them were over 80 years of age.

The patient is instructed in breathing ex immediately on return to the ward, and next day takes part in the routine ward exercises. These gradually increased in range, and he is allowed up the ninth day. Owing to pressure on beds patients h been discharged home on the tenth postoperative by ambulance. They are instructed to get up increasing periods during the next fortnight. The patients have been got up on the second day, and period has been gradually increased day by day they are up and dressed for most of the day by the te postoperative day.

measured natural die-away rates, and the values ie killing-rates due to the disinfectants were by subtracting the average settling-rate from lie-away rates measured in the presence of the ectants.

. 3 illustrates the distribution of settling-rates at dif- relative humidities. These settling-rates range from 21 per hour, and show little or no correlation with relative humidity. The average settling-rate is 12·5 per hour. Assuming the particles to be equivalent to spheres of density 1, this corresponds to a particle-size range of 12·5µ to 27µ in diameter and an average particle-size of 20µ in diameter. The comparison of counts on the settling plates with those taken in the slit sampler confirmed the estimates of size made from the die-away rates.



elationship between settling-rate ticles shaken from handkerchiefs lative humidity.

of Aerial Disinfectants

le II shows the results obtained with ultraviolet triethylene glycol, lactic acid, and α-hydroxy- ıyl-butyric acid at different relative humidities. disinfectants were chosen as being the most ve at present available.

three chemical disinfectants were liberated into r of the room by being dropped on to a hot plate ained at 200–250°C. This plate was placed just the air stream of a small table fan to ensure the mixing of the disinfectant vapour with the room he aerial concentration of each of the three chemical ectants used was about twice that recommended ıse in occupied rooms. Ultraviolet rays were ıed from a 100-watt quartz low-pressure mercury- ır lamp capable of an effect at least 100 times that in practical aerial disinfection. Even at the rable concentration levels of these experiments, l killing-rates were obtained only at lower relative dities with ultraviolet rays, and higher humidities lactic acid, than would normally be found in this try in winter. In view of the high settling-rate of particles (12·5 per hour) and the occurrence of lation-rates of at least 2·5 per hour in occupied s, a killing-rate of 15 per hour would be needed duce the count by half. In contrast, aerial dis- tants are rapidly and effectively bactericidal to rne particles expelled from the mouth in sneezing rdillon ét al. 1942).

E II—EFFECT OF AERIAL DISINFECTANTS ON HANDKERCHIEF PARTICLES

ıfectant gent	Killing-rate at relative humidity									Concentration of disinfectant (µg. per cu. ft. of air)
	10	20	30	40	50	60	70	80	90	
ıviolet s ..	40·5	..	25	18·5	10	10	10	..	..	*
hylene ıol ..	..	..	0	0	0	8	8	..	..	200
c acid..	..	..	0	0	10	37	82	75	60	150
droxy- nethyl- yric acid	..	..	0	0	2	15	15	2	..	200

, effective intensity of ultraviolet rays was about 100 times that ommonly used for aerial disinfection

DISCUSSION

The impressive fact that on the average 15,000, and occasionally as many as 50,000, particles may be distributed from a dry used handkerchief by gentle manipulation gains in significance when it is further realised that these particles while airborne are almost completely resistant to the action of the best available aerial disinfectants. Not only this, but they are eight times the weight of "droplet nuclei" from the mouth and may therefore carry a correspondingly larger content of micro-organisms. We believe these particles come chiefly from the nose, and Hamburger and Green (1946) have shown that streptococcal infections of the respiratory tract are spread very largely by the nasal carrier of that organism. Hare and Mackenzie (1946) suggest that this may well prove to be true in other specific infections. The relative numbers of particles and the total weights of dried secretion which they represent for the actions of coughing, sneezing, and gentle manipulation of the handkerchief were as follows:

	Sneezing (per sneeze)	*Coughing* (per cough)	*Handkerchief* (gentle waving for $^1/_2$ min.)
Av. no. of airborne particles ..	100,000 ..	400 ..	15,000
Size ..	10µ	.. about 10µ ..	20µ
Dried weight (g.) ..	10^{-4}	.. 4×10^{-7} ..	10^{-4}

Dried weight means weight of expelled airborne secretion in equilibrium with the relative humidity of the air. The numbers of airborne particles emitted during sneezing are quoted from Bourdillon et al. (1942), and during coughing from unpublished work of this unit.

Though the dried weights of material dispelled by sneezing and handkerchief waving are about the same, it is a matter of everyday observation that sneezing is much rarer than the using of the handkerchief. There are good reasons for believing that talking and nose blowing contribute few airborne particles, and therefore the use of the handkerchief is probably the most important single action, except bed making, in the contamination of the air with micro-organisms from the respiratory tract.

This paper is concerned entirely with the airborne particles coming from the shaking of handkerchiefs. It is fully realised that larger particles which settle rapidly, whether from coughing, nose blowing, sneezing, or handkerchief waving, may be of equal or greater importance in the spread of respiratory infection. This point is now being investigated.

SUMMARY

The number of bacteria-carrying particles which can be shaken from normally used handkerchiefs has been estimated.

The average number over a series of 211 handkerchiefs was 136,000.

These particles are resistant to the action of aerial disinfectants and ultraviolet rays at normal relative humidities.

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Another series of tests was made to compare this standardised mechanical shaking with manual shaking performed by an operator wearing only bathing trunks and a dust mask, and with wet skin and hair, who remained inside the experimental room. The actions of a person using a handkerchief were imitated as closely as possible. The handkerchief was withdrawn from its pot, shaken to unfold, held near the nose, and replaced in the pot. This cycle of operations was repeated for $^1/_2$ min. (usually four times). The handkerchief was then shaken for $^1/_2$ min. by the routine technique.

Under these conditions roughly a fifth as many particles were removed by the gentle manual shaking as by vigorous mechanical agitation for the same period:

	Manual shaking		*Mechanical shaking*
	14,400	..	62,400
	22,000	..	55,200
	6000	..	42,000
	11,200	..	44,400
	33,200	..	100,800
	1600	..	20,400
	3200	..	23,200
	4400	..	29,200
	4000	..	30,200
	47,200	..	195,200
Total ..	147,200		603,000
Average ..	14,720		60,300
Ratio ..	1		4

The mechanical shaker thus gives an estimate of the total numbers of particles which can be shaken from a used handkerchief and has the advantage over manual shaking of a greater degree of reproducibility.

Even after shaking till no more particles were removed, as many again could be removed by extracting the handkerchief with 200 ml. of 10% broth-saline solution.

It is not maintained that all the bacteria-carrying particles shaken from the handkerchiefs came originally from the nose. A few plates showed many small colonies of non-hæmolytic streptococci similar to the mouth and throat flora, but in most of the plates examined most of the colonies were staphylococcal, resembling the flora of nose and skin. A large proportion of golden staphylococcal colonies was obtained from the handkerchiefs of most volunteers who showed an abundant growth of *Staph. aureus* from nose swabs.

Fig. 2 shows the distribution of counts in 211 handkerchiefs. The mean count of the whole series is 68,000 for a $^1/_2$ min. shaking. These figures represent about half the total numbers of particles which could be shaken from the handkerchiefs by prolonged agitation, and give an average figure of 136,000 for the total number of particles which could be removed by this means. The counts follow a log-normal distribution. The subsidiary peak of counts less than 2000 is due to a certain number of volunteers who did not use their handkerchiefs at all.

Correlation with Nasal Discharge.—Table I shows the relationship between the average counts of particles, shaken from handkerchiefs, classified into groups on the basis of the degree and type of nasal secretion of the user. There is but small difference between the total counts in the various groups, suggesting that the daily output of bacteria from the nose during a cold does not differ much from the normal output.

TABLE I—RELATIONSHIP BETWEEN NASAL DISCHARG PARTICLE COUNTS AFTER MECHANICAL SHAKING HANDKERCHIEFS FOR $^1/_2$ MIN.

Nasal discharge during use of handkerchief	No. of handkerchiefs	Count	
		Average	Range
Normal	122	68,000	0–420,
Slight serous ..	37	60,400	13,600–300,
Profuse serous ..	37	59,600	6400–192,
Purulent	15	94,000	2400–300,

DIE-AWAY RATES OF AIRBORNE PARTICLES FROM HANDKERCHIEFS IN THE PRESENCE AND ABSENCE OF AERIAL DISINFECTANTS

Method

To assess the size of the particles and their susceptibility to disinfectants, experiments were made as follows. Two or three handkerchiefs were shaken at the same time to give a sufficiently high initial count in the experim room. Half a minute was allowed for the co particles to settle, and then air sampling was begun a continued for 12 min. During measurements of natural die-aways serum-agar plates were exposed in room. In killing tests the disinfectant was liber at the end of the first minute of sampling. The relat humidity of the air was measured before and after e experiment. Low relative humidities were obtained b the use of a silica-gel air-drier, and high humidities b spraying water into the air. The plates were incubat for 24 hours at 37°C, and the slit sampler plates were the divided into $^1/_2$ min. sectors and counted. The successi $^1/_2$ min. counts were plotted on graph paper for the determination of the die-away rates and of the killing-rates due to the disinfectants.

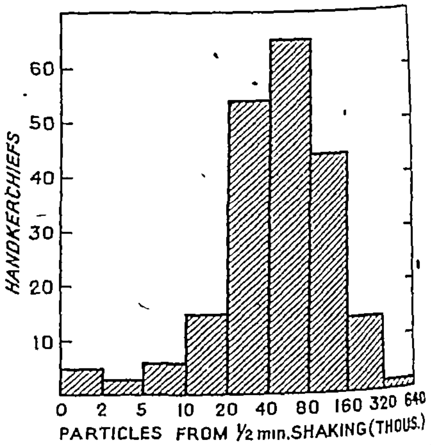

Fig. 2—Histogram of bacteria-carrying particle counts from used handkerchiefs shaken for $^1/_2$ min. each.

Results

The removal of bacteria-carrying particles from t air approximated to a logarithmic law such that t numbers removed in successive short intervals of t were proportional to the numbers present at the b ning of each interval—i.e.,

$$N = No\,e^{-kt}$$

where *No* is the number present at time $t = o$; k constant; and *e* the base of natural logarithms. If several processes which individually lead to the rem of bacteria in a logarithmic manner are taking p simultaneously, the total rate of disappearance (or d away rate) is equal to the sum of the rates due to e process. Thus, in an experiment using a disinfect the total rate of die-away will be a combination of rates of removal due to settling, ventilation, and de by disinfection. In these experiments the ventilat rate of the chamber was measured and found to be 0·4 per hour, which is negligible compared with rates of removal by settling or disinfection. The val of the settling rates were therefore taken as equival

THE LANCET

LONDON: SATURDAY, JULY 31, 1948

Inguinal Hernia

THE repair of damage to a simple sphincter is ficult enough. In the case of the inguinal ring. e sphincter is far from simple: it bears some emblance to one half of an iris diaphragm, and body is quite certain how that diaphragm works. it is surprising that surgeons do on the whole tain better results with inguinal herniæ than nateurs obtain with the works of their cameras.

The anatomy of the human groin has long been own in great detail, and anatomists and surgeons ree on the main features of its architecture. The ysiology of the inguinal canal, by contrast, remains a state of flux, and each operator varies the details his repair according to his surmises as to the action of the well-known structures of which the nal is composed. Even the most obvious questions e still subjects of controversy. For example, nat is the real barrier to hernia formation in normal ople—is it the musculature of the internal ring. is it the transversalis fascia? Does the cremaster ay an important part in preventing hernia, or does presence facilitate the onset of rupture? If the mponents, muscular and tendinous, of the conjoint ndon act as a sphincter, it must be agreed that they e only half a sphincter; is then the opposite side that sphincter Poupart's ligament, or is it (as . F. LUNN[1] has suggested from his comparative ıdy of the inguinal region) Cooper's ligament and e superior ramus of the pubis? And should we erefore throw not only Bassini's bag but also his ggage overboard, cease using Poupart's ligament one pillar of our hernia repairs, and use Cooper's ament instead as the foundation of attempts to rrow the internal inguinal ring? Do the fascial ngs which LYTLE[2] emphasised really act as a third nincter inside the ordinarily described internal g?—One could fill a page asking such questions, of which require an authoritative answer if hernia erations are to have a proper scientific basis and eir disturbing recurrence-rate is to diminish.

There is one point in the operative repair of hernia ıich is everywhere accepted—namely, that narrow-cked sacs must be completely removed. But ost herniæ require something more than simple rniectomy if recurrence is to be avoided. The ditional repairs needed attempt either or both of o things—reconstruction of an inguinal sphincter blocking of the "hole" through which the hernia s emerged. The most thorough recent attempts to construct a sphincter mechanism have been by ANDON[3] and DOUGLAS.[4] BRANDON divides the ternal oblique at the medial end of its origin from oupart's ligament, moves the cord laterally, and reattaches the muscle. DOUGLAS has lately described in our columns an operation whereby the testis is dissected free from the scrotum, and, on the end of the spermatic cord, is threaded through a hole made in the internal oblique 4 or 5 cm. above its lower border; after which the testis is replaced in the scrotum. Ingenious as these methods are, the new sphincters are crude by comparison with Nature's efforts, and the late results of the operations are not yet known. At the present moment the method of blocking the defect through which the hernia emerges seems more popular. The weak point in this procedure (its crudity needs no comment) is that the cord still has to emerge from the abdomen, and the blocking operations therefore cannot be complete. When BRANDON and DOUGLAS have contrived their new sphincters, they can proceed to a complete blockage of the old "hole" (which DOUGLAS does with tantalum gauze). But if the cord retains its anatomical site, the best that can be done is to close most of the hole, leaving the internal oblique and transversalis (which have already failed once at this job) to guard a smaller aperture than before. Obviously these muscles must not be further damaged during the repair, and the frequent failures of Bassini's operation are probably due to the fact that the tight sutures approximating the internal oblique to Poupart's ligament kill the muscle fibres within their grasp.

Modern repair operations of the "blocking" type use various materials. Normal structures in the neighbourhood may be sutured in new positions to narrow the gap, but it is uncertain how often they retain both their new position and their old function. Autogenous fascia, locally obtained or imported from the thigh, in sheets or in strips, may be employed. Foreign materials—metal, silk, and nylon—are fashionable at present, and we have recently published papers describing the use of all three. MAINGOT[5] has recorded in detail his technique with floss silk, which has given excellent results. MOLONEY and his colleagues[6] believe nylon to be better, because it is homogeneous and smooth, and because a chance infection of a wound, which may linger for many months in the interstices of silk, will heal without the nylon requiring removal. Whether silk or nylon is used, the repair is usually by a darn, so as to avoid tension in the fibres and any possibility of strangulating muscle fibres. Those who have closed a hole in a sock with a few tight sutures will appreciate the superiority of the darn in that situation, and there is reason to suppose that the body also appreciates the darn rather than the suture for the closure of gaps in its fabric. Unlike the sock, it will assist the darner by filling in interstices with fibrous tissue.

The latest comer in the ranks of foreign materials for hernia repair is poly-ethylene sheeting, a plastic whose use is described on another page by WALTER THOMPSON. It is easy to shape and remains rigid in the tissues, but at first sight it seems to lack an advantage of tantalum gauze to which DOUGLAS refers, in that it has no meshes through which fibroblasts can grow to anchor it firmly in position.

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Reviews of Books

Thorpe's Dictionary of Applied Chemistry

(4th ed.) Vol viii *Methal—Oils, Essential.* London: Longmans, Green. Pp. 679. 80*s.*

THIS splendid work is of value not only to chemists but also to many other workers in medical and biological fields. So wide is its scope that few would fail to find pleasure in dipping into it. The eighth volume follows the same lines as its predecessors. No less than 175 pages are given to a monograph on naphthalene, but the remainder of the book is liberally sprinkled with articles of biological interest. That on milk ably summarises the chemistry, biochemistry, technology, and (very briefly) the bacteriology of the "lacteal secretion of the milch cow." There is an account of nucleic acids by the late Prof. J. M. Gulland with G. R. Barker; J. H. Quastel contributes an account of biological nitrogen fixation, and B. C. J. G. Knight a well conceived summary of growth factors for micro-organisms. Biochemical articles include those on methionine and nicotinic acid. The electron microscope is treated in a simple and understandable way, and the article on molecular distillation is of interest in connexion with the preparation of fat-soluble vitamins. Hope springs when one reads of the astounding number of substances prescribed for the moth-proofing of textiles, while the essential oils bring the volume to a fragrant close.

Myotonia

Thomsen's Disease (Myotonia congenita), Paramyotonia, and Dystrophia myotonica: a clinical and heredibiologic investigation. EIVIND THOMASEN. Aarhus: Universitetsforlaget. 1948. Pp. 251.

IN this valuable and comprehensive work, translated from the Danish by F. B. Carlsen, Dr. Thomasen gives a clinical and physiological account of myotonia and describes the diseases in which it occurs, with particular reference to the associated non-muscular dystrophies. He has investigated the influences of these diseases on the social condition of the patients, and on their mental state; and in a personal study of 5 family histories of Thomsen's disease, he brings up to date the famous pedigree recorded by Thomsen himself, giving details of 106 descendants of an affected member of the family not available to Nissen when he published his edition of the pedigree 25 years ago. Four additional new pedigrees of Thomsen's disease include only 13 affected individuals, thus offering a contrast to the heavy incidence and clearly defined genetic character found in members of Thomsen's family. Since Dr. Thomasen has made an exhaustive search for cases in Denmark, the disease is clearly as rare as it is reputed to be.

In the genetics section he gives 21 new pedigrees of dystrophia myotonica, covering 1148 individuals of whom 874 are still living; 150 members are thought to have been affected. The appearance of antedating has been repeatedly noted in this disease, and is confirmed in this series. An attempt to grade the cases suggests that manifestations are increasingly severe in successive generations. Dr. Thomasen concludes that, from the clinical as well as from the genetic standpoint, Thomsen's disease differs fundamentally from dystrophia myotonica.

Die Sauna

VICTOR OTT. Dr. med., physician in the medical faculty, Zürich. Basle: Schwabe. 1948. Pp. 224. Sw. fr. 15.

THE Finnish bath, which is essentially designed to induce sweating, has been known since classical times. The usual procedure is to enter the hot-air chamber first, and to rest there on a couch until sweating begins. The skin may then be further stimulated by rubbing and pummelling, and a bundle of twigs is often used for this purpose in Finland. The body may then be douched with warm or cold water or be soaped before a short immersion in a nearby stream or lake. A further period of sweating may follow when the bather has got out of the water before cooling begins. Sometimes water is poured over hot stones at this stage to cause a sudden evolution of steam, but exposure to this is too exhausting for some subjects. At the end of the bath it is customary to rest for a while, and massage is sometimes given at this stage. Often the proceedings end with a square meal.

In recent years the Finnish bath has been stud doctors and has come into use beyond its count origin. The Swiss opened the first therapeutic ba 1941 in the physiotherapy department of the Univ of Zürich. There are now 150 public and nu private baths of this type in the country. The va sweat baths has been known in Switzerland sin sixteenth century, especially in chronic disorders as gout and rheumatism; but in Finland the ac medical indications for these baths have been num It is considered that the resistance of the Finn to cl changes and extremes is augmented by bathing, and regulations of the Finnish army prescribe a weekly even on active service. Dr. Ott has treated a nu of cases and concludes that sweat baths are val in numerous subacute—but not acute—infections, in asthenia and circulatory disorders. The baths st the circulation and body temperature and reduce w One of the outstanding benefits of a regular cou baths, even for healthy people, is the acquisition of greater tolerance to climatic changes and extremes.

The Venereal Diseases (2nd ed. London: Macm 1948. Pp. 360. 21*s.*).—This edition maintains the h standard of its predecessor, and has been brought up date with two additional chapters on the use of peni in the treatment of gonorrhœa and syphilis. The sect on non-gonococcal urethritis has been extended, and Reiter syndrome receives adequate description. Dr. James Marsha presents the venereal diseases, and those other condition commonly dealt with in the practice of venereology, accurate and clearly, and the text is supported by ample illustrat

Handbook of Practical Bacteriology (8th ed. Ed burgh: E. & S. Livingstone. 1948. Pp. 624. 25*s.*).— of new methods such as the use of selenite F medi *S. typhi*, and new information about infections like blastomycosis or scrapie of sheep, have swollen this la guide by Prof. T. J. Mackie and Dr. J. E. McCartn it still retains the essential qualities of a handbook f who must housekeep for rats or wash glassware, b knowing how to distinguish the viruses of lymphocyt pseudolymphocytic choriomeningitis.

The Science and Practice of Surgery (8th ed. Lo J. & A. Churchill. 2 vols. 1948. Pp. 892 and 955. 25*s.* ea The day of the large single-author textbook of general su has passed. Even two authors can scarcely hope to co many fields, if they are to speak with authority on Mr. W. H. C. Romanis and Mr. P. H. Mitchiner, in the edition of their well-known book, have enlisted help with chapters on plastic surgery, X rays, anæsthetics, and va disease. Even so, the industry required of two men to and then revise a book of over 1800 pages must be prodi The book preserves its previous form but much of it has rewritten to bring it up to date. Thus the section on g infection contains a note on streptomycin; though the paragraph, recommending the intravenous injection of in unspecified quantity, provides a quaint contrast. might pick many small holes of detail in the book, b fact that this is its eighth rebirth is an effective ans carping criticism.

Treatment by Manipulation (5th ed. London: Lewis. 1948. Pp. 275. 25*s.*).—The new edition Timbrell Fisher's well-tried book contains much fresh m and 45 additional illustrations. In his preface he r readers that patients bedridden for years owing to rheumatic disease may respond to skilled manipulat recovering the use of their legs; and that they sho given the opportunity. Objections to the use of ma tion, he says, are commonly two. Doctors fear sho increased pain and stiffness for their patients: but untoward reactions are extremely rare in the pract experienced surgeons using manipulation. Secondly generally believed that physiotherapy can do as mu manipulation to restore function and full range of move Many patients, however, improve up to a point on ph therapy, but get no further; and for these manipulation achieve in five minutes more than physiotherapy could years. The book is clearly written, and splendidly illustr sk of rubber designed to fit closely over the mouth and e. Experimental patterns of half-mask with highly cient filters, designed to overcome disabilities in ion and use of tools during wear, have not proved eptable in underground working conditions, and earch is now being directed to the design of less cient but simpler respirators in the hope that these l be accepted by workers. The simpler respirators l stop up to 90% of pathogenic particles, and their use uld at least reduce the risk of silicosis. However, n if miners agree to wear such a respirator, its use l not take the place of effective dust suppression, ich is the basic preventive measure. The aim should to make dust suppression in industry as complete possible, respirators being worn only in the occasional ances when suppression is impracticable.

ATHLETICS AND HEALTH

SEVERAL superficially simple problems associated with scular exercise still evade unchallenged explanation. titch," for example, was for centuries regarded as ociated in some way with the spleen, and classical olars have been prepared with quotations to show at the runners of antiquity underwent splenectomy or any rate some sort of attention to this viscus. Since ch can be right-sided, some favoured a diaphragmatic lanation, which in turn has been replaced by a usible one based on experiments at Guy's Hospital, rding to which there is a "physiological viscerois" and the site of the disability is in the ligaments pleural attachments. Yet athletic experts remain onvinced. Cramp is another teaser, for it arises ealthy young people under conditions which seem have nothing in common—during exercise, at it when turning or stretching, after yawning, when e position is held excessively long, or after profuse ating. Then there is march hæmoglobinuria, in which rcise is not the only factor, for the erect attitude is a sine qua non. These are some of the subjects ussed in *Manpower* for March–September, 1947, lished by the Union of South Africa, in a treatise nly the work of Dr. E. Jokl, whose official position Johannesburg has given him exceptional opportunities investigating the effects of exercise. This paper gives ne remarkable examples of athletes who have permed successfully for years free from symptoms and aware of gross cardiovascular lesions which necropsy s shown must have been present for a long time. Thus he iron man of South African rugby football," who lapsed and died after a strenuous game, was found to re a greatly hypertrophied heart with numerous rotic patches, an exceedingly narrow left coronary ery, a descending aorta less than half the usual calibre, d an advanced unilateral hydronephrosis. The ampion marathon runner of South Africa is a man of whose medical history includes rickets, scarlet fever, eumatic fever, malaria, bilharziasis, and inguinal rnia, and who has mitral and aortic disease—a reminder it aortic regurgitation is of *functional* benefit when perimposed on mitral disease. Examples of adjustment clude a Davis Cup lawn-tennis champion with severe ibetes; a girl of 19 with myasthenia gravis who with e aid of 'Prostigmin' played international hockey; d a professional gymnast with severe deformity of the est following several thoracoplastic operations.

British cardiologists have denied the possibility of eart strain" in the normal person, and their pronouncents, together with those of Adolphe Abrahams on the hletic side, are examined in the treatise. Clearly, llapse after exertion should be related not to the heart it to the vasomotor system. Some extremely efficient hletes are particularly prone to collapse, apparently cause of the general autonomic adjustment which the body undergoes during training. Responsible factors include a hot humid atmosphere, hypoglycæmia, orthostatic strain, reduced atmospheric pressure, malnutrition, and the effect of a recent infection. Despite the alarming appearance of a collapsed young adult, there is no reason to presume either cardiac strain or any permanent disability. Nor, apparently, can a full stomach be blamed for such attacks. Schoolboys have been known to prepare for a ten-mile cross-country run by eating a double helping of Irish stew and treacle pudding.[1] Common sense would condemn such a procedure, but it seems certain that a combination of exercise and a distended stomach alone will never cause fatal collapse in a healthy person. The position is very different if the coronary arteries are diseased or the myocardium degenerated, when a full stomach may be the ultimate cause of death, the rise in intragastric pressure eliciting a reflex constriction of the coronary arterial system with dangerous anoxæmia in a heart whose tissue respiration is already impaired.

TRACES OF THE PAST

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[1] See *Lancet*, 1938, i, 1258.

An Unfair Burden

To provide for superannuation, doctors in the National Health Service are liable to a deduction of 6% from their net remuneration from State sources, to which the Government will add another 8%. For the well-established practitioner the sums in question will be substantial: for example, if a doctor is earning £2400 from his N.H.S. practice, and a third of this is regarded as practice expenses, there will be a deduction of £96 from his income, the additional contribution from the State being £128. Before July 5, when there was no official pension provision for doctors, most medical men found it necessary to take out heavy insurances to safeguard their families and provide for their own retirement. Under the new régime it was clearly going to be difficult for them to continue these insurance commitments when large sums were deducted from their incomes for superannuation purposes. Accordingly arrangements have been made whereby, between now and Oct. 4, practitioners may (subject to conditions set out in the official leaflet S.D.D.) exercise an option to remain outside the superannuation scheme, pay no portion of their income to superannuation, but receive instead the 8% State contribution towards the maintenance of approved insurance policies.

Attention is drawn to this option in a letter which we publish this week from a medical insurance consultant. Clearly there may be definite advantages in it, especially perhaps for the doctor who is already well insured but will have few remaining years of service to count for superannuation. No doubt many doctors thus situated will welcome the chance of opting out of the superannuation benefits and receiving very present help towards their expensive insurance premiums. But there is another group whose need is even greater, and who can, nevertheless, receive no relief under the regulations as published. Many younger men have borrowed heavily in order to buy a practice, and for this purpose they have been required to insure their lives for considerable sums. The premiums they are paying sometimes represent a high proportion of their budget, and it may be almost impossible for them to go on paying these premiums if they also have to forego 6% of their income for superannuation. These are the very men who might find the 8% of State money paid towards insurance premiums most acceptable. Yet they do not qualify to receive this help, because their policies are technically assigned to the bank or to the insurance company that has lent them money to buy their practices. Many of these doctors belong to that group, enduring financial hardship, for whom the Government have promised early payment of compensation. If it had been possible for this compensation to be assessed and paid by Oct. 4 they would be in a position to have their policies released from assignment to their creditors, and could then exercise their option to keep these policies in being as an alternative to superannuation. As any such settlement is manifestly impossible in so short a time, this relief is withheld from them, and some whose budgets are already closely drawn will face certain insolvency if they must bear the double load. While it is obvious that if insurance is to take the place of superannuation and be the chief means of provision for retirement, insurance policies must not be surrendered before maturity or be assigned to another person, it seems that considerable latitude should be allowed in these particular cases. The assignment is directly attributable to a loan the date of whose payment (and the consequent redemption of the policies) depends on the date of payment of a sum of compensation promised (and guaranteed) by the Government themselves. It should not be hard to lay down conditions whereby the ultimate use of these policies for the benefit of the doctor and his dependants could be assured, even though the policies had temporarily to remain assigned to the bank or other reputable lender pending the payment of compensation.

This is certainly a matter that needs attention urgently. A rapid and equitable solution might materially reduce the numbers of the young doctors to whom the early payment of compensation on grounds of hardship will otherwise be essential. Failure to find a solution will place an unfair burden on many harassed men, including many returned from war service, who, with growing families, are now striving to establish themselves in practice.

Annotations

HOSPITAL RECORDS

NEARLY twenty years ago, when the old poor-law institutions were transferred from the boards of guardians, their records were in some instances mutilated or even destroyed in the process. Today a transfer on a much larger scale is taking place: hospitals of every kind—voluntary and municipal, big and little, new and old, general and special—are passing out of the care of their guardians into the smooth hands of the regional hospital boards. These hospitals possess records. In the long march of history the small hospital is just as important as the great, and what is new in 1948 may be treasured in the 21st century. Minutes of boards of management and of staff meetings, matrons' reports, notes of operations, diet sheets, patients' case-records, accounts, and other routine commentaries may seem drab enough just now, when there is little space for storage and much demand for salvage; but they are the stuff out of which social history is made.

Hospital records should be carefully preserved, at least until they have been reviewed by an expert. Many local authorities have record offices staffed by trained people who would take pleasure in sifting material of this kind. There is ample scope for voluntary work on the part of men and women who have an interest in local history. Let us not throw away this unique opportunity of service to history.

RESPIRATORS AND DUST DISEASES

A CORRESPONDENT this week asks why writers on pneumoconiosis do not mention the use of a simple mask, such as nurses wear during operations, as protection against the inhalation of dust. It is virtually impossible to design a completely efficient dust respirator which does not impose some discomfort or disability on the wearer; and tests on miners and other workers have shown that they will not tolerate one which is uncomfortable. Simple gauze respirators similar to a surgeon's mask are acceptable to some miners, but unfortunately they are almost useless in stopping the passage of pathogenic dust particles, which are less than 5μ in diameter. The official Mark IV dust respirator is much more efficient; but very few miners are willing to wear a respirator of this type, which incorporates a half of rubber designed to fit closely over the mouth and

Experimental patterns of half-mask with highly nt filters, designed to overcome disabilities in and use of tools during wear, have not proved table in underground working conditions, and ch is now being directed to the design of less nt but simpler respirators in the hope that these e accepted by workers. The simpler respirators top up to 90% of pathogenic particles, and their use l at least reduce the risk of silicosis. However, if miners agree to wear such a respirator, its use not take the place of effective dust suppression, h is the basic preventive measure. The aim should make dust suppression in industry as complete ssible, respirators being worn only in the occasional nces when suppression is impracticable.

ATHLETICS AND HEALTH

VERAL superficially simple problems associated with ular exercise still evade unchallenged explanation. itch," for example, was for centuries regarded as ciated in some way with the spleen, and classical lars have been prepared with quotations to show the runners of antiquity underwent splenectomy or ny rate some sort of attention to this viscus. Since h can be right-sided, some favoured a diaphragmatic lanation, which in turn has been replaced by a sible one based on experiments at Guy's Hospital, rding to which there is a "physiological viscerosis" and the site of the disability is in the ligaments pleural attachments. Yet athletic experts remain onvinced. Cramp is another teaser, for it arises ealthy young people under conditions which seem have nothing in common—during exercise, at at when turning or stretching, after yawning, when e position is held excessively long, or after profuse ating. Then there is march hæmoglobinuria, in which rcise is not the only factor, for the erect attitude is a sine qua non. These are some of the subjects ussed in *Manpower* for March–September, 1947, lished by the Union of South Africa, in a treatise inly the work of Dr. E. Jokl, whose official position Johannesburg has given him exceptional opportunities investigating the effects of exercise. This paper gives ne remarkable examples of athletes who have permed successfully for years free from symptoms and aware of gross cardiovascular lesions which necropsy s shown must have been present for a long time. Thus he iron man of South African rugby football," who lapsed and died after a strenuous game, was found to ve a greatly hypertrophied heart with numerous rotic patches, an exceedingly narrow left coronary ery, a descending aorta less than half the usual calibre, d an advanced unilateral hydronephrosis. The ampion marathon runner of South Africa is a man of whose medical history includes rickets, scarlet fever, eumatic fever, malaria, bilharziasis, and inguinal rnia, and who has mitral and aortic disease—a reminder at aortic regurgitation is of *functional* benefit when perimposed on mitral disease. Examples of adjustment clude a Davis Cup lawn-tennis champion with severe abetes; a girl of 19 with myasthenia gravis who with e aid of 'Prostigmin' played international hockey; d a professional gymnast with severe deformity of the est following several thoracoplastic operations.

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St. Paul's, and the Legal Board of the Church Assembly, and on the secular side the Privy Council, the Ministry of Health, the Royal Colleges of Physicians and Surgeons, and the General Medical Council. The Act seemed still to have some spark of vitality when referred to in D'Allax *v.* Jones in 1856, but the subsequent passing of the Medical Act presumably quenched whatever was still smouldering. With the 1511 Act will also disappear section 3 of the "Acte concerning Phisicions," passed some eleven years later. This section explained that in dioceses outside London "it is not light to find alway men able sufficiently to examine (after the statute) such as shall be admitted to exercise physic in them." By way of remedy it directs that, before anyone is to practise physic in England, he must first be examined in London by the president of the recently incorporated College of Physicians (presumably Thomas Linacre) and must be able to show testimonials of his approval, though there is a saving for any graduate from Oxford or Cambridge "which hath accomplished all things for his form without any grace."

Herbalists will be pleased to know that, though the Act of 1511 is doomed, the Act of 1542 is left untouched, which in some degree excepted therefrom those "honest persons, as well men as women, whom God hath endued with the knowledge of the nature, kind, and operation of certain herbs, roots, and waters." There still will remain on the statute-book, therefore, the long preamble which unkindly accuses the orthodox admitted surgeons of attending too closely to their fee-books. "The most part of the persons of the said craft of surgeon," concludes the preamble, "have small cunning, yet they will take great sums of money and do little therefor, and by reason thereof they do often times impair and hurt their patients rather than do them good."

In 1948 the rival claims of the qualified and the unqualified are still occasionally contrasted; the restrictive mood of 1511 is not yet fully reconciled with the toleration of 1542. Historians have little use for statute-law revision which eliminates the traces of the past. It cannot be contended, however, that the Act of 1511 is of value as living law. It would disqualify every registered practitioner who is qualified today.

ALLEGED NEGLECT

IT is none too easy to find good homes for mentally retarded children, and there are disquieting features in the charge of neglect successfully brought against Miss G. E. Sherwood, of Potters Bar, by the Royal Society for Prevention of Cruelty to Children. Briefly, the case for the prosecution was that one of the children in the home was found to be emaciated but gained weight rapidly when transferred to hospital. The case for the defence, supported by the expert evidence of Dr. A. F. Tredgold, was that children of low-mental grade often fail to make full use of the food given them: the disorders of development responsible for severe mental deficiency are liable to interfere with physical functions, including metabolism and digestion. The other children in the home seem to have been well cared for; and parents (including doctors) have testified to Miss Sherwood's devotion to her work. But the jury, who had been shown a photograph of the wasted child, found her guilty, and she was sentenced to a day's imprisonment.

This defendant seems to have broken the rules about licensing and periodical medical examination; there may also have been mismanagement; or a degree of neglect. But sometimes malnutrition of defective children—with results likely to horrify a jury—cannot be prevented; and this verdict will not increase the confidence of other people who may be trying to look after mental defectives whose power to assimilate food is faulty. Often the strictures of parents—who may be suffering under a load of half-conscious guilt for having relinquished the chi at all—do nothing to make the nurse's task lighte Miss Sherwood's long record of good and conscientio care of mentally defective children has not saved he from adverse judgment over one difficult case.

COMPENSATION

GENERAL practitioners who joined the National Heal Service by July 5 and were previously working a principals are entitled to compensation for losing th right to sell the goodwill of their practices.[1] It will b remembered, however, that compensation is payable t doctors (or their personal representatives) who hav retired or died since the passing of the Act on Nov. 6, 194 provided their practices have not since been sold in part or whole. Hence, as compensation cannot be pai twice over, a doctor who has succeeded to such a practic without purchase, will have no claim to compensatio

Claims for compensation must be submitted in prop form by Oct. 31: only in special circumstances caus unavoidable delay will a later claim be admitted, an *in no case will it be considered after April 30, 194* These dates have been fixed, and are to be strictly adhered to, because until all claims are registered and assessed it will be impossible to calculate and distribute the compensation due to any claimant. Further grace would thus defeat the present intention of having all claims assessed and agreed, and the amount of compensation individually determined, before July 5 next year.

The annual value of the goodwill (known also as the "annual loss") will be taken as being the average gro yearly receipts of the practice during the last tw accounting years before the appointed day. The receipts need to be certified by a qualified accounta or alternatively the certificate of the approp Inspector of Taxes will be accepted. In the cas practices purchased after the beginning of the tw accounting years immediately before the appointed da the annual loss will be the average gross yearly recei of the practice as estimated for the purpose of th purchase. A committee of five (three of whom will b medical practitioners) is to be set up to deal with a claims that need special consideration. As soon a possible after the decision on a claim is reached th claimant will be told what the Minister regards as th annual value of his practice for compensation purpo It will be open to him, if aggrieved by this decision, to apply (within fourteen days) to have his annual lo determined instead by arbitration.

When all claims have finally been received and determined, they will be added together to find th aggregate annual loss claimed by the sum total of gener practitioners. Only when this figure is known will i be possible to divide the sum so obtained into th global sum voted by Parliament for the payment o compensation, and so determine the factor (equival to the number of years' purchase) on which the act amount of compensation payable in respect of ea practice, or share of a practice, will depend. Once t factor is known, and the actual amount calculated each practice, the practitioner will be notified. Wh a practitioner has already retired or died, compensati will be payable for claims as soon as may be after t amount has been ascertained: in other cases it w be payable on the death or retirement of the practition —whichever comes first. (Retirement means retirem from practice as a medical practitioner providing gener medical services under part IV of the Act.) Provis is also made, however, for advance payment of part o all of the compensation where hardship would otherw

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[1] National Health Service (Medical Practices Compensati Regulations, 1948. Statutory Instruments, 1948, no. 1 H.M. Stationery Office. 2*d*.

If this hardship is due to heavy charges in respect ns raised for the purchase of the practice, the nt must forward particulars of the amount of an outstanding, the interest charges, the rate of ment of principal, and the cost of insurance ums (if any) taken as condition of loan. All such ation will be treated as confidential, as will also rticulars submitted of practice earnings and rship shares. Claims for advance payment on ds of hardship may be submitted at any time.

rest will be payable at the rate of $2^3/_4$% per annum, come-tax, as from July 5, 1948. The first pay- will be made on July 5, 1949, but thereafter yments will be made half-yearly, on Jan. 5 and . The regulations recognise and allow for modifis that may have to be made by amending legislafter the report is received from the legal committee sent investigating the special position of partner-

Nevertheless it remains necessary for partners, y with single-handed practitioners, to submit Oct. 31 certified particulars of their gross annual ts. This they are advised to do without undue as soon as they receive the appropriate claim form their executive councils.

MOTHER OF ORTHOPÆDIC NURSING

w often great pioneers must find that their success ken them by surprise. It can hardly have occurred nes Hunt, when she opened a small convalescent for children in the Shropshire village of Baschurch, she was about to become the founder of orthonursing. Indeed, the whole scheme was started t at random. Daughter of a positive and eccentric er, she was one of a family of eleven. As a child eveloped joint disease, but recovered sufficiently in as a nurse in the Royal Alexandra Hospital, and at Salop Infirmary, and to become a district —no sinecure at any time, but in those days a ne trial of strength. "One day," she wrote in nemoir, "mother broke it to me that she was ing too old and deaf to do her work in London, hat she intended to live with me. This was rather w." A new plan had to be made: and the conent home was opened on the joint income of er and daughter, plus subscriptions amounting to 2s. 3½d. In his book, *Doctors Differ*,[1] Dr. Harley ams describes the vitality of this ramshackle place. When space ran short the children were d in a shed in the garden, and did astonishingly forthwith the open-air régime became a principle eatment at Baschurch. When the advice of an pædic surgeon was needed, Agnes Hunt, crippled by a recurrence of her old disease, shepherded a crew of splinted children by train to Liverpool, e railway porters wheeled them to the Southern ital; and there she met Robert Jones. After a uch visits she tentatively suggested that he should ne visiting surgeon to her odd hospital; he accepted, then began one of the most fertile partnerships in cine. "Robert Jones performed the operations Miss Hunt performed the rest." She was naturally oped for the task; she had fun, and saw to it that hildren had fun; and she had experienced what alled "the great education of pain." She needed lk of reablement to teach her that crippled people arming for a struggle; the children in her hospital plays, learned football, and were taught the nts of trades. Mr. G. R. Girdlestone[2] has written ose early years: "We who walked with Robert s and Sister Hunt in the original Baschurch Hospital very fortunate—those were golden days! The ition was in the foundry, white hot and spilling over!" The hospital with the old shed in the garden grew, during the 1914-18 war, into the Auxiliary Orthopædic Hospital at Baschurch, with Agnes Hunt as commandant; and later into the Robert Jones and Agnes Hunt Orthopædic Hospital near Oswestry.

In 1924 she thought her work was to be permanently interrupted by illness; but not a bit of it: she was at the beginning of a long career in organising aftercare for cripples, in the course of which she founded the Derwen Cripples Training College. Dame Agnes lost her surgical collaborator in 1933 but herself survived to the age of 81, dying last week at her home in Baschurch.

THE ENGLISH LOCAL PRISON

"THE truth is that our prisons have beaten the Prison Commissioners. They were built for punishment in solitary confinement; and the hopeless congestion within the confining walls makes any real modification well-nigh impossible. A prison is little more than a disciplined slum, with most of the disadvantages of slum life."

These words come from a foreword, by Mr. George Benson, M.P., to a new pamphlet[1] from the penal reform committee of the Society of Friends. There is not a prison in England that is not overcrowded, even by 19th century standards; and the remedy, he suggests, is only by real reform—a rapid increase in the number of minimum security camps. The accounts here given by Quaker prisoners, imprisoned for refusal to fight in the war, are sufficiently vivid and disquieting. During the war advances made in earlier years were swept away, staff was scarce, and the hours spent by prisoners in workshops were greatly reduced, until some 18 or 19 hours in the 24 were spent alone in the cells. Though some of the lost ground has been regained, and the educational and library services have been improved, no extra services can make up for lack of staff and crowded quarters. The standard of hygiene is evidently shockingly low. Twenty men queue to empty their chamber-pots in a closet which is often stopped up; toilet paper, toothbrushes, combs, and even handkerchiefs are hard to come by; a prisoner has known what it is to go five weeks without any change of socks or shirt, or even a towel; Wandsworth prison was infested with bugs in the bed boards; baths are dirty, cleaning materials not provided. Apart from the mental effects of living for long terms in such surroundings, prisoners are not well supervised physically. The medical inspection on admission is often quite trivial and the examination on discharge even more perfunctory. Sometimes the newly admitted prisoner is not even required to undress. "The examination for venereal disease," writes one prisoner, "consisted in the question, 'Have you any discharge?'." Though occasionally a prisoner speaks well of the diet, food is often poor and badly prepared, with too little in the way of fresh fruit or green vegetables; and none is served between 4 P.M. and breakfast.

These are not conditions of life under which anyone could profit by measures for his reform; and many prisoners suffer deterioration rather than improvement in their outlook. Some indeed become mentally ill. Mr. C. F. Carter, who edits the pamphlet, urges that it is time for Britain to catch up with the best standards in other countries. "She will not do so at the snail's progress of the last thirty years."

Sir **WILLIAM GILLIATT** has been re-elected president of the Royal College of Obstetricians and Gynæcologists.

Surgeon Rear-Admiral C. E. **GREESON** has been appointed medical director-general of the Navy in succession to Vice-Admiral Sir Henry Colson who retires at the end of this year.

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ndon: Jonathan Cape, 1946.

e Robert Jones Tradition. A lecture given to the staff of he Wingfield-Morris Orthopædic Hospital, Oxford, 1947.

[1] Snail's Progress. Edited from the Experiences of Quaker Prisoners, 1939–48, by Charles F. Carter. London: Society of Friends, Friends House, Euston Road, N.W.1. 1948. Pp. 28. 1s.

Special Articles

BRITISH EMPIRE CANCER CAMPAIGN

ANNUAL REPORT

A message of appreciation and confidence from H.M. the King accompanies a second volume[1] of the report covering the year 1947 and commemorating the 25th birthday of the campaign.

Several of the individual items recorded here have been noticed previously in these pages.[2] The scientific advisory committee anticipates even greater activity in research as the outcome of planning, and of training and exchanging personnel with other countries. An integrating subcommittee is to study the plans of all the standing subcommittees in order to coordinate and make recommendations for future work. The main directions of extension are to be in virus and clinical fields.

PENILE CANCER

Prevention, early diagnosis, surgery, and X-radiation remain the solutions of choice in human therapy. Prevention, it appears, may have to be begun far earlier than has hitherto been supposed. To his previous account of tumours whose incidence varied with the social scale, and thus probably with attention to, or neglect of, hygiene,[3] Sir ERNEST KENNAWAY, F.R.S., has now added some new data on cancer of the penis. This has long been known to be avoidable when circumcision is performed by Jewish rites, but it is apparently not preventable when the operation is done in conformity with Moslem custom. The difference in results is explained by the difference in age at operation: in Jews this is undertaken at the age of 8 days, whereas in Moslems it is undertaken at the age of 14 years or later. This puts back the time for prevention very close to what Peyton Rous has described as the only ivory tower that man ever knows—the uterus. But even this haven of immunity from carcinogens has been suspect since urethane has been reported to exert its tumour-provoking properties through the placenta.[4] Probably other carcinogens are able to travel the same route; it has always been surprising that on the whole Bittner's agent is held back.

PULMONARY CARCINOMA

Prevention of cancer of the lung is urgently needed, for its incidence is increasing at a striking rate; the increases each year from 1944 to 1946 were 412, 489, and 783. This continued rise has suggested an investigation into the composition of atmospheric dust, which has been initiated by the Medical Research Council and is being carried out by Sir ERNEST KENNAWAY and his team. The pertinacity and fecundity of this indefatigable alliance must be an inspiration to the discouraged. Inquiry may show that the horse has already left the stable; for if the latent period of lung cancer is anything like that of other diseases, its cause was in operation long ago. But although gross atmospheric pollution may be decreasing, the use of oil-fired boilers is now on the increase and may conceivably be a factor in causation; and, as the Kennaways themselves have pointed out, there is also a general increase in cigarette smoking.

PROSTATE

Unfortunately, the clinical-cancer research committee finds that the number of patients who consult a doctor within the first three months of prostatic cancer is as low as for other sites (only 53·5%), and that the in whom the disease is of over 6 months' standing first seen is as high as 20%. Metastases may be p in 27% of all cases when first examined; and enlargements regarded as benign, when excised, to be malignant. The extensive data on trea and follow-up of cases in the London hospital recorded were collected before the introduc œstrogen treatment. A later series, including th of treatment, will provide a valuable comparison.

No rationale of the action of œstrogens has yet app and experimental attempts to elucidate this action been frustrated, according to Mr. E. S. HORNING, by the tendency of transplantable prostatic carci to keratinise spontaneously as well as under the inf of stilbœstrol, and even when grown alone in cast mice. The newer therapeutic agents, like œstro may modify cancer in some of its aspects, both p logical and symptomatic, but they fall far shor controlling the disease in the sense of regul dominating, or doing away with it.

Annual Meeting

AT the annual meeting in London on July 19, a mes was received from H.R.H. the DUKE OF GLOUCESTE president of the campaign, who expressed gratificati that Lord Horder's recent broadcast appeal had result in the receipt of over £10,000. He referred to th tour of the United States and Canada which is be made by a delegation headed by Lord Horder, chairma of the scientific advisory committee.

Mr. J. P. LOCKHART-MUMMERY, chairman of t executive committee, who proposed the adoption of annual report, said that since its foundation in the campaign had grown enormously; and one of original aims—the coordination of research—had almost completely achieved. He agreed with Horder's suggestion that a short, non-technical of the campaign's work ought to be published f information of the lay public; but, as editor annual report since the campaign's foundatio have found the difficulties—and shall I say the dan of producing one in simple language, insurmount In the United States a Federal grant of no les 14 million dollars had been made for cancer research education; and the campaign had trebled the am spent annually on research.

The Garton medal and prize was presented by Vis Hailsham, chairman of the grand council, to Prof. Dodds, F.R.S., who returned the prize as a contribu to the campaign's funds.

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[1] British Empire Cancer Campaign: Twenty-fifth Annual Report, covering the Year 1947. Issued from 11, Grosvenor Crescent, London, S.W.1.

[2] *Lancet*, 1947, ii, 835; *Ibid*, p. 512; *Ibid*, 1948, i, 561.

[3] Kennaway, E. L., Kennaway, N. M. *Acta Unio internat. contre Cancer*, 1937, 2, 101.

[4] Larsen, C. D. *J. nat. Cancer Inst.* 1947, 8, 63.

PHARMACOPŒIAL NAMES AND APPRO NAMES

THE General Medical Council has issued a pamp setting out the names of drugs made official fo first time by their use as the titles of monograph *British Pharmacopœia*, the new edition of which into force on Sept. 1.[1] Names for certain other for which no official monographs are provided, hav published as approved names, the intention bein if any of the drugs is eventually described in the *Pharmacopœia*, the approved name shall becom official title. Some of the other names are reg trade-marks. It is hoped that the approved will be generally adopted and used in prescribing introduction of new names for substances having ph copœial names or approved names is especially cated; but if a manufacturer should desire to under a proprietary name a drug for which an appr name has been provided, it is strongly recomme that the label shall bear the approved name of substance in letters no less conspicuous than the which the proprietary name is printed or written.

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[1] See *Lancet*, July 3, p. 19.

following names have been made official by da to the *B.P.*, 1932, and by the *B.P.*, 1948 :

Pharmacopœial names	*Other names*
sol	Stovarsol
aenaphthone	Kapilon-Oral : Prokayvit
ocaine Hydrochloride	Decicaine
crine Hydrochloride	Acramine Yellow
tamine	Benzedrine
tamine Sulphate	Benzedrine Sulphate
thol	Avertin
ine Sulphate	Butyn
Aminobenzoate	Butesin
hol	Doryl
fon	Yatren
caine Hydrochloride	Nupercaine
cortone acetate	Doca
e) Injection of	Perabrodil
an	Butolan
aol	Cignolin
fying Wax	Lanette Wax SX
mine Tartrate	Femergin
arbitone	Evipan
arbitone Sodium	Evipan Sodium
us Ointment	Eucerin (Hydrous)
l Oil	Lipiodol
l	Uroselectan-B
ol	Cardiazol
hthone	Kapilon
ine Hydrochloride	Atebrin : Quinacrine Hydrochloride, *U.S.P.* XIII
ine Methanesulphonate	Atebrin Musonate
yl, Injection of	Salyrgan
lphenobarbitone (Phemitone)	Prominal
gmine Bromide	Prostigmin
gmine Methylsulphate	Prostigmin
amide	Coramine
cin, Injection of	Pitocin
uin	Plasmoquine
arbitone Sodium	Nembutal
ine Hydrochloride	Dolantin ; Demerol
toin Sodium	Epanutin
terone, Injection of	Proluton
Protein	Protargol
Aurothiomalate	Myocrisin
ıen	Fouadin
cetamide	Albucid
cetamide sodium	Albucid Soluble
nilamide	Prontosil Album
apyridine	Dagenan ; M. & B. 693
in	Germanin ; Bayer 205 ; Antrypol
hylline with Ethylenediamine	Euphyllin ; Cardophylin
ntone Sodium	Pentothal Sodium
essin, Injection of	Pitressin
Ether	Vinethene
Alcohols	Hartolan Wax
Alcohols, Ointment of	Eucerin (Anhydrous)

following are new approved names :

proved names	*Other names*
ide	Cetyltrimethylammonium bromide ; Cetavlon
arbitone	5-Δ^1-Cyclohexenyl-5-ethylbarbituric acid ; Phanodorm
caprol	2 : 3-dimercaptopropanol ; British Antilewisite ; Bal
hylstilbamidine	4 : 4′-Diamidino-α-β-dimethylstilbene
ole	4-Cyclohexenyl-3-ethyl-1 : 2 : 4-triazole ; Azoman ; Triazole
enide	*p*-Aminomethylbenezenesulphonamide ; Marfanil
chol	Trimethylmethoxypropenylammonium bromide ; Esmodil is a 0·3% isotonic solution
phen	2 : 6-Dimethylthianthrene ; Dimethyldiphenylene disulphide ; Mitigal
midine	α : ω-(4 : 4′-Diamidinodiphenoxy) pentane
Pheniodol	α-Phenyl-β-(4-hydroxy-3 : 5-diiodophenyl)-propionic acid ; Biliselectan
Pholedrine	β-Methylamino-4-hydroxypropylbenzene ; Veritol
Proguanil	N-*p*-Chlorophenyl-N-*iso*propylbiguanide ; Paludrine
Propamidine	α : ω-(4 : 4′Diamidinodiphenoxy) propane
Sodium Stibogluconate	Sodium antimonyl gluconate ; Pentostam
Stilbamidine	4 : 4′Diamidinostilbene
Sulphadimidine	2-(*p*-Aminobenzenesulphonamido) 4 : 6-diamethylpyrimidine ; Sulphamezathine ; Sulphadimethylpyrimidine
Thialbarbitone	5-Δ^2-Cyclohexenyl-5-allyl-2-thiobarbituric acid ; Kemithal
Thiomersalate	Sodium ethylmercurithiosalicylate ; Merthiolate

PAY-BEDS IN HOSPITAL

UNDER the National Health Service Act nobody need pay for hospital care. But charges can be made to patients who ask for a bed in a single room or small ward (the so-called amenity bed) and to those admitted to pay-beds as the private patients of doctors belonging to the service. Regulations governing these charges have now been published.[1]

"*Amenity Beds.*"—Accommodation in a single room or small ward cannot be secured by payment unless it "is not for the time being needed by any patient on medical grounds." The charge is designed to cover part of the cost, and will normally be 6*s.* a day for a single room or 3*s.* a day for a ward with two or more beds. In hospitals where the average daily cost of an inpatient is less than 24*s.* these charges will be reduced.

Private Accommodation.—Provided it does not prevent their being used by any patient who urgently needs them on medical grounds, the hospital may set aside beds for patients who are prepared to pay the whole cost, being admitted as private patients under the care of their own doctor. If the hospital has insufficient data for estimating the cost of the accommodation thus set aside, the standard daily charge for such beds will be the average daily cost of an inpatient in the hospital plus 25% for a single room, 15% for a room with two beds, or 5% for a room with more than two. But since the patient will be paying privately for his medical attention it would not be reasonable for him to pay also for medical attention from the hospital staff. The standard daily charge will therefore be reduced by an amount representing the average daily cost per inpatient of the remuneration of the specialist staff, or (if the patient is admitted under the care of a general practitioner) of the whole of the medical staff.

Medical Fees Payable by Private Patients.—The Minister has laid down a schedule of maximum fees payable to doctors attending private patients in a hospital pay-bed. The following are examples :

Physician.—For the first consultation, 5 guineas ; for the first two days' attendance (including first consultation), 10 guineas ; for each subsequent day of attendance or consultation, 1 guinea. Total not more than 25 guineas.

Surgeon.—Cases involving operation : all services including operations and any necessary attendance—major operation, 50 guineas ; intermediate operation, 25 guineas ; minor operation, 10 guineas. Cases not involving operation : as for physician.

Obstetrician.—For booked cases, 50 guineas ; obstetric emergencies, 40 guineas.

Psychiatrist.—Deep insulin therapy (full course), 75 guineas. Special individual psychotherapy : first consultation, 5 guineas ; subsequent consultations, 3 guineas.

Anæsthetist.—For each operation, 2 guineas plus 10% of surgeon's fee.

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al in the seventh addendum to the *British Pharmacopœia*, 32, but not included in the *British Pharmacopœia*, 1948.

[1] National Health Service (Pay-bed Accommodation in Hospitals &c.) Regulations. Statutory Instruments, 1948, no. 1490.

Pathologist.—Single examinations involving less than an hour's bench work, $1^1/_2$ guineas; multiple and more complicated examinations, 3 guineas; examinations with clinical consultations, 5 guineas.

Radiologist.—For investigation, various fees from 2 to 6 guineas. Radiotherapy, 3 guineas per treatment; total not more than 25 guineas.

Medical Practitioner, other than Specialist.—For a surgical operation, including all attendances and other services rendered, 7 guineas. For each consultation or day of attendance, 15*s.* Total not more than 15 guineas.

If the total charges made by "all the medical practitioners concerned in respect of one series of treatments of a patient for relief of the same condition exceeds 75 guineas" the charges of each shall be scaled down proportionately, so that the patient does not in fact pay more than 75 guineas.

These maxima, however, will not apply if the hospital is satisfied that the patient or his representatives have agreed with the practitioner to pay larger fees. The board of governors or management committee will secure, "as far as may be reasonably practicable," that not more than 15% of the hospital pay-bed accommodation (other than "amenity beds") is occupied by patients for whom there is no limitation of medical charges. If the pay-bed accommodation is less than 20 beds, 3 may be so occupied.

Private Outpatients.—The regulations lay down charges which the hospital should normally make for pathological, radiodiagnostic, radiotherapeutic, or physiotherapeutic services to private patients for outpatient treatment.

WORLD HEALTH ASSEMBLY

HAVING sat for a month, the assembly last Saturday concluded its first meeting, which was followed at once by the first session of the executive board of the World Health Organisation, with Dr. Aly Tewfik Shousha Pasha as chairman, and Dr. K. Evang and Dr. W. W. Yung as vice-chairmen. The director-general of W.H.O. will be Dr. Brock Chisholm, who has been executive secretary of the interim commission and was elected to the new office by 46 votes to 2. The interim commission's proposed budget for the coming year has been cut by 23% to 5 million dollars.

PHYSICAL EDUCATION

AN International Congress on Physical Education, Recreation, and Rehabilitation opened in London last week. Delegates from over 50 countries have been shown what is being done here.

On Tuesday representatives from the Commonwealth countries were entertained to luncheon at the Apothecaries' Hall by the Research Board for the Correlation of Medical Science and Physical Education.

Dr. FRANK HOWITT, the chairman, recalled that the board originated during the war with the aim of improving the utilisation of manpower. Since then it had concentrated largely on the physical education of young people and industrial workers, and many of its recommendations had been implemented by the Government. With the Nuffield Foundation it was now studying the care of adolescents in industry. He hoped that the present conference would result in the formation of a Commonwealth and Empire Council with the same objects as the board.

Mr. PHILIP NOEL-BAKER, Secretary for Commonwealth Relations, spoke of the value of physical education: he wanted to see the British, like the ancient Greeks, a nation of athletes. Mr. J. H. BEASLEY, Australian resident minister in London, felt that coöperation between nations would come best by joining in purposes like this that really matter to mankind. Lord WEBB-JOHNSON, P.R.C.S., said that the board was founded in difficult times; but such times provided the stimulus and led governments to spend money on real needs. He urged Ministers not to allow the disintegration of the Army's physical development centre for recruits, which was unique in the world. A government which talked of a National *Health* Service, rather than a mere *medical* service, must take account of the work of the board.

Public Health

Typhus in Northern Ireland

Two cases of typhus have lately been reported Omagh, co. Tyrone. When first seen by the medical officer, who, under the new health assumed responsibility for the control of infe disease on July 5, one patient was still in Omagh Hospital while the second had returned home. Felix reactions were done; in both cases there was agglutination of *OX* 19, slight agglutination of and no agglutination of *OX K.*

The patients' house was found, on investigat be unfit and verminous. There had been fre contacts between the infected family and roving gips tinker bands who frequent the patients' village an travels from the west of Ireland, where typhus is endemic. Though actual proof is still lacking, there little doubt that the disease, which has been shown of the louse-borne variety, came from these gipsies.

All contacts have been removed to hospital; steps are being taken to trace every gipsy band thr out Northern Ireland, and to treat them with So far no further cases have been reported, but all have been warned of the possibility.

The Health of Scotland

Reviewing 1947, the Department of Health Scotland calls it a fairly satisfactory year[1] The birt rate at 22 per 1000 was the highest since [illegible]; matern mortality at 2·0 per 1000 live births was the lowest o record; the crude annual death-rate was very litt altered from that in previous years; and the mortal rates in infants and children showed many satisf features, including a further decline in the mor and mortality of diphtheria. Poliomyelitis, br produced the largest outbreak ever experienced in land—1434 confirmed cases with 131 deaths enteritis was the cause of a slight increase in the mortality rate: in the 16 towns 1123 deaths we buted to infantile diarrhœa, compared with 642 The tuberculosis figures, as mentioned in our article last week, were also disturbing, with notifications compared with 9713 in the previous and a rise in deaths from 3984 to 4096. "We ha go back to 1928–32 to find comparable rates improvement gained between that time and the beg of the war has all been lost." Facilities for the tional treatment of tuberculosis were even less s factory than in previous years, principally because difficulty of obtaining nursing staff, and efforts are made to enlist more part-time nurses and ward ord "In one hospital," it is stated, "experiments were in running a ward on the hostel system by the pat themselves, with only nursing supervision."

Births and Deaths in June Quarter

The Registrar-General[2] reports that infant mort in England and Wales for the June quarter of established a new low record; the rate was 31 per live births. The previous lowest rate for any qu was 32 in the September quarter of 1947; and the previous rate for a June quarter was 39 in 1947.

The stillbirth-rate for the June quarter, 23 per total births, is the lowest recorded for any June qu in the corresponding quarter of 1947 the rate w

The number of live births registered during the q was 203,711, compared with 202,184 in the pr quarter and 235,174 in the same period last year corresponding rates were, respectively, 19·0, 18 21·9 per 1000 population.

There were 110,356 deaths in the quarter, repre a record low death-rate for any June quarter of per 1000 total population, compared with 11·0 for second quarter in 1947 and the previous lowest rat a second quarter of 10·4 in 1945.

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1. Report of the Department for 1947. H.M. Stationery 1s. 6d.
2. Registrar-General's Weekly Return of Births, Deaths, Infectious Diseases for the week ended July 17, 194 Stationery Office. 6d.

In England Now

Running Commentary by Peripatetic Correspondents

r Stockholm hotel baths cost 3s. apiece, so everyone to huge sports palaces or gymnasia, somewhat like Greeks of old. I joined in such a throng, bought a et for 1 crown 25 öre (about 1s. 9d.), deposited my ables in an individual safe, and moved on to the ole bath-house. Imagine a swimming-pool surrounded vide alcoves two stories high and crowded with naked , lounging, reading, showering, climbing stairs, or nming. Middle-aged women fussed about shepherding n into the right pens and distributing towels. It ned that there were six men and one woman per alcove. ot knowing a word of Swedish, and realising that few nary Swedes know any other language, I learned the ine by a process of observation. The ritual was to and then go in succession from a hot moist room to ll hotter and moister one, in each sitting on a grand- d seat as at a football match, only nude and piring. I fought for every breath. Thereafter came y shower and a plunge in the pool below, which was real object of my visit. Naturally I got the order all ng, so an amazon had to drag me from the edge of pool and send me the right way round.

ecovering in my alcove afterwards I watched mas- ne Stockholm standing around in stained-glass udes discussing weighty problems. It was like the vre come to life. No Socrates graced this assembly; there were men of all ages, hairy or bald, thick or thin, gling with Apollos by the score.

is an impressive attitude of mind and custom that ain might well adopt in these days of chronic water tage; but somehow I cannot see us doing it.

* * *

uring the peripatetic wanderings on industrial arch problems of my younger days there was an epted but scientifically unsubstantiated convention I left behind a desolate and sorrowing family to be ced only by the return of paterfamilias laden with s. But at that time the gifts were relatively easy to ne by. There was rock in plenty to be had in Edinburgh toffee in Everton, with no personal points at stake, much attractive china in the potteries as one could ggle home with, and endless supplies of pretty cotton ks in Lancashire. Now, when one is not allowed to e one's sweet coupons away from home, when any sing clothing coupons must be accounted for on one's rn, and when the shops are full of things that our ort market won't touch, the buying of suitable sents may well absorb all one's spare time and spare h. However, finding myself the other week in the llands and knowing that my wife, with an optimistic on the English summer, wanted what is called a wim-suit," I determined to take a chance on that. efficient young lady sold me the very latest thing in on, and then, without batting an eyelid, warned me t the recipient should not on any account be photo- phed in it for in the resulting picture it would be quite nsparent. Sceptically, but slightly shaken, I took it ne, to be faced with the same story from my daughter. ll sceptical, I tried it on the "highest authority," r whom I happened to sit next day on committee. sighed "Yes. Many young men have generously ught bathing-dresses for their girl friends and are king forward to a revealing summer holiday. A dis- pointing time will be had by all—except the girl ends." Thus does English folk-lore keep in step with dern invention.

* * *

It is said that no two people see identical images of the me object. Do two newspapers ever make the same- ing of the same news? Take the Minister of Health's port for 1946, published last week. I saw that THE NCET, with customary sobriety, headed its summary Health and Disease in 1946." In the same strain the headline in a famous northern paper: "The tion's Health in 1946." Rather more risqué is the ption of our most famous London daily: "Better alth Figures." And this gaiety has also pervaded the ice of the leading Labour paper, which says: "Britain ays in Good Health." More ecstatically a London ening came out with "Nation was Never So Healthy," nile from Glasgow we have "Birth Rate at Record Level." But euphoria was not universal, for other papers announced: "More Deaths from Whooping-Cough" and "No Cure for Cold." At first I thought the best of all was: "281 Mothers who Need Not Have Died—Report of a Secret Inquiry": but the palm goes to the resourceful sub-editor who wrote: "We're Underfed and Getting Thinner, says Britain's M.O."

* * *

She was middle-aged and good-looking and kept a little business and her husband had left her. She shed no tear but her uterus began to bleed profusely and a crippling attack of lumbago laid her low. My gynæcological colleague, referring her to me, said that in his experience a sudden metrorrhagia of this kind was usually of emotional origin; and when I asked her about her other trouble, her first words were "it's like a stab in the back." Well, clinically she had no more than a prosaic prolapsed disc, but I think you will agree that her diagnosis was the right one. And how would you set about curing her?

* * *

How incalculable is the goodwill of our practices! A few mornings ago I was telling my not-so-ancient jobbing gardener of the illness of my wife and mentioned that I had called in young Dr. C, who had insisted that she be admitted forthwith to the nearest hospital. The not-so-ancient observed thoughtfully, "Ah! You wouldn't have known old Dr. C, would you, sir?" I replied that he was before my time and the not-so-ancient continued, "Ah! He was a grand doctor he was. Very clever he was, sir. If he said one of his patients wasn't going to get better he never did."

* * *

One of your peripatetic correspondents suggests the need for an Institute of Individual Research. For a long time now I have felt that there should be a Research Foundation for Criticism and Exposition. Its workers would agree to do no original investigations whatsoever. Their task would be to collect, correlate, and criticise (constructively one hopes) the original researches of others. The need for this is obvious since the volume of published facts and theories is growing with more than arithmetical progression. About 25 years ago I collected a bibliography of well over 3000 references to the physiology and pathology of the ovary. Many more additional papers must have accumulated since that time. It is almost impossible to read all the published work on even a small aspect of the medical field like this, and at the same time to carry out active research, clinical work, or teaching. The amazing thing is that many investigators manage to read so much. Personally I skim through a large number of journals and note a few titles which interest me. Of these I read the conclusions or summary of a few, and rarely I read a whole paper.

You may say that my demand is already met by the authors of textbooks, monographs, and reviews, but most of these are produced as a side-line to teaching or active experimental or clinical work. What I ask is that someone should finance carefully picked research-workers who could devote their whole time to constructive reviewing of a chosen field. The Fellows would be chosen from among those who can make vivid arrangements of essential facts but have no aptitude for experiment. The existing major research foundations would certainly turn down any applicant for a fellowship who proposed as his subject: "A critical review of the world literature on this or that."

* * *

I have decided to write a weekly paragraph on *What the Registrar is Wearing*, designed to keep job-hunters informed on this important aspect of medicine. Here is this week's instalment.

A tweedy montage is now the fashion in Harley Street, more or less in at the waist, with slight pectoral accentuation and an off-the-shoulder ceinture. A yard of rayon crêpe stitched inside the left cuff avoids the danger of losing a precious handkerchief and ensures permanent smartness. Collars should be stiff and white, offset by a grey (congenital or acquired) shirt; if there are several interviews a week paper collars can be worn and suitably disposed of according to the result of the interview. A double-breasted ensemble will be sure to impress, though for the pædiatric applicant an Eton-jacket may help.

Letters to the Editor

IMPROVEMENT OF THE NATIONAL DIET

SIR,—Since nobody else has taken up the points put forward by Dr. Leitner in his letter in your issue of May 22, perhaps you will permit me to do so. It is surely an astonishing fact that at the present time on the staffs of our hospitals there are no nutritionists recognised as such. We have no nutritional clinics, and apart from the occasional clinician who chooses to make it his special study, this vital subject might hardly be thought to figure in our practice at all.

This contrasts very strikingly with the situation in the United States. Picking up a number of the *Journal of the American Medical Association* at random—the issue of May 15—I notice that in a list of annual meetings of State medical societies two out of four have made nutrition the special subject for discussion. It might be understandable if in present circumstances our colleagues in the United States were to take the subject somewhat for granted, but it is scarcely credible that we who are beset incessantly by the problem should so consistently ignore it.

One result is that, as often as not, the public is led by the nose by the biochemists. Nutritional surveys are repeatedly undertaken on a basis of admirable biochemistry but only the most rudimentary clinical observation—which is hardly surprising in view of the fact that they are carried out not by doctors but by biochemists. Since it is only when malnutrition is severe that biochemistry is likely to prove informative, it is not surprising that the results of these surveys, and the widely publicised announcements based on them, so frequently arouse the derision of the practising clinician.

It is surely time that our hospitals, and especially our teaching hospitals, to whom we look as pioneers, reconsidered their responsibilities in the matter, and appointed nutritionists to their staffs. Nowadays the importance of nutrition as the foundation of health can hardly be exaggerated, and the subject grows apace in scope and complexity. The nutritionist has come to stay, and it is clearly essential that first of all he should be trained in medicine, and secondly that he should be a clinician of the highest possible standing and experience.

G. E. BREEN.

The *Medical Press*, 8, Henrietta Street, London, W.C 2.

BACTERIOLOGICAL NOMENCLATURE

SIR,—From your leading article of June 19 it is clear that a generally acceptable nomenclature and classification of bacteria cannot be established yet. The existing confusion is due to a human tendency to see patterns, and to recognise genera and species on too few and incomplete data. You say that scientific names are now given to bacteria with the intention of making clear the relationship of one organism with another. Topley and Wilson[1] meant the same when they said: "The most promising *a priori* conception upon which to base a classification is the conception of species in a phylogenetic series."

My argument is that at the moment nobody can see clear in all this, and committee-work is no remedy. Phylogeny should start with the simplest characters—i.e., morphology. Here already too much is taken for granted. Bacteriology traditionally recognises spheres, rods, and spiral forms. The foundation of this fundamental *differentiation is continual observation* of dead, dried, fixed, and *stained* bacterial preparations—*in other* words, post-mortem work. Pathology had its origin in the post-mortem room; for morphological studies, its bacteriological branch still largely follows "morbid anatomy" methods. The electron microscope is a dangerous additional tool, and more and more artefacts are being studied.

Undeniably electron micrographs and methods of differential staining enrich knowledge of bacterial structure. The danger is that the resulting pictures are not usually interpreted from what can be made visible in live preparations, the reason being that live preparations of bacteria are rarely studied. Dark microscopy, the method of choice for this purpose, been abandoned by most workers through lack of suitable light source. For a number of years I have used (South African) sunlight, which is about the brightest light source available. As a result of examining thousands of preparations of live bacteria I have concluded that at least the motile "bacteria" are not rods, but spirals. During activity they present themselves as rotating, gyrating, undulating, spiral bodies and their cell walls are by no means rigid. A comparison with "spirillums" showed that there is little to choose between the living shapes of "bacteria" and "spirillums," except perhaps in length and amplitude of coils. Further observations convinced me that bacteria have no outside motor-organs, and that the wavy structures commonly called "flagella" are mucous twirls which occasionally peel off from the mucous coat through the very movement of the bacterial body.[2] A ciné-micrographic film (1400 ft) illustrating all this is available in Britain through Dr. W. E. van Heyningen, hon. secretary of the Society for General Microbiology, Sir William Dunn School of Pathology, Oxford. An abbreviated copy (750 ft), which may serve as an introduction to the subject, is with the Royal Microscopical Society.

Obviously, if my views are correct the difference between "bacteria" and "spiral forms" largely falls away, and "bacterial flagella" are no more. This would disturb fundamental conceptions of bacterial morphology, and a thorough revision of nomenclature and classification would become necessary. This brings me back to my starting-point—that efforts at bacteriological systematics are premature.

ADRIANUS PIJPER
Director of Institute for Pathology
Pretoria, South Africa. University of Pretoria.

CARS FOR DOCTORS

SIR,—I am afraid Mr. Gresham Cooke's remarks have done little to brighten the prospect for those of us who have been nursing and cajoling ancient cars into a semblance of roadworthiness, while patiently waiting for the "really early date" at which the "high degree of preference" we enjoy would bring the new car.

Mr. Cooke will agree that a few instances of abuse must not be allowed to set the pace for the machinery whereby priority is given effect, and the present machinery is faulty partly because abuses are possible at all. If doctors are to accept some 4000 patients under contract with the Ministry of Health (would Mr. Cooke advise against this on the ground that—human nature being what it is—they might all decide to be ill at once?), efficient transport for doctors must be taken for granted, and the question of what constitutes a serviceable car for a doctor must be settled without delay and with precision.

I suggest that a "serviceable" car is the car Mr. Cooke would wish his own doctor to have when he needs him urgently—when for instance he has met with an accident and is bleeding from a severe head wound. Neither Mr. Cooke nor Mr. Bevan would accept the plea that the car only needs "a little attention" as an excuse for neglecting the call; nor would any doctor neglect it, although his job is made doubly anxious and difficult by an unreliable car. To wait until the car will not go at all, and will therefore pass muster as "unserviceable," is obviously fantastic. No-one needs a doctor with an unserviceable car, and the doctor would rightly be accused of negligence if he pretended to run a practice with it. He should be given every assistance in avoiding the catastrophe; and what help is he in fact getting?

He must have the formal sanction of the B.M.A. (so formal that it amounts to testifying that the doctor is a doctor), but he can only get this by first persuading the garage which normally handles his car that she is more trouble than she is worth. The garage provides a kind of "disability certificate" by which it implies that the car had better be replaced. In requesting the garage proprietor to give this, one is asking for no

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[1] Wilson, G. S., Miles, A. A. Topley and Wilson's Principles of Bacteriology and Immunity, 3rd ed. London, 1946.

[2] *J. Path. Bact.* 1946, 58, 325. *J. Bact.* 1947, 53, 257. *J. b photogr. Ass.* 1947, 16, 3. *Photogr. J.* 1948, 88B, 3. *Na Lond.* 1948, 161, 200.

meets the eye. and I rely on Mr. Cooke's knowledge
uman nature to know what it is. Very bluntly.
is asking the proprietor to deprive himself of a
ble source of income, while circumstances, Authority,
"nature", prompt him to keep it. This is far too
a responsibility for him (quite apart from any
ion he may have for his ever-ailing patient), even
he prophet enough to know at what point exactly
ar must be condemned in order to avoid disaster in,
ine months' time. Neither the length of the waiting-
or the probable state of the car at the end of it,
own to him, and he very sensibly postpones the
ard decision as long as he can. While constant
r repairs and occasional major ones will keep the
n the road an optimistic view of its performance
s appropriate, and the doctor can always hire one
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IMPROVEMENT OF THE NATIONAL DIET

SIR,—Since nobody else has taken up the points put forward by Dr. Leitner in his letter in your issue of May 22, perhaps you will permit me to do so. It is surely an *astonishing fact that at the present time on* the staffs of our hospitals there are no nutritionists recognised *as* such. We have *no nutritional clinics*, and apart from the occasional clinician who chooses to make it his special study, this vital subject might hardly be thought to figure in our practice at all.

This contrasts very strikingly with the situation in the United States. Picking up a number of the *Journal of the American Medical Association* at random—the issue of May 15—I notice that in a list of annual meetings of State medical societies two out of four have made nutrition the special subject for discussion. It might be understandable if in present circumstances our *colleagues in the United States were to take the subject* somewhat for granted, but it is scarcely credible that we who are beset incessantly by the problem should so consistently ignore it.

One result is that, as often as not, the public is led by the nose by the biochemists. Nutritional surveys are repeatedly undertaken on a basis of admirable biochemistry but only the most rudimentary clinical *observation—which is hardly surprising in view of the* fact that they are carried out not by doctors but by biochemists. Since it is only when malnutrition is severe that biochemistry is likely to prove informative, it is not surprising that the results of these surveys, and the widely publicised announcements based on them, so frequently arouse the derision of the practising clinician.

It is surely time that our hospitals, and especially our *teaching* hospitals, to whom we look as pioneers, reconsidered their responsibilities in the matter, and appointed nutritionists to their staffs. Nowadays the importance of nutrition as the foundation of health can hardly be exaggerated, and the subject grows apace in scope and complexity. The nutritionist has come to stay, and it is clearly essential that first of all he should be trained in medicine, and secondly that he should be *a clinician of the highest possible standing and experience.*

G. E. BREEN.

The *Medical Press*, 8, Henrietta Street, London, W.C.2.

BACTERIOLOGICAL NOMENCLATURE

SIR,—From your leading article of June 19 it is clear that a generally acceptable nomenclature and classification of bacteria cannot be established yet. The existing confusion is due to a human tendency to see patterns, and to recognise genera and species on too few and incomplete data. You say that scientific names are now given to bacteria with the intention of making clear the relationship of one organism with another. Topley and Wilson[1] meant the same when they said: "The most promising *a priori* conception upon which to base a classification is the conception of species in a phylogenetic series."

My argument is that at the moment nobody can see *clear in all this, and committee-work is no remedy.* Phylogeny should start with the simplest characters —i.e., morphology. Here already too much is taken for granted. Bacteriology traditionally recognises spheres, rods, and spiral forms. The foundation of this fundamental differentiation is continual observation of dead, dried, fixed, and stained bacterial preparations—in other words, post-mortem work. Pathology had its origin in the post-mortem room; for morphological studies, its bacteriological branch still largely follows "morbid anatomy" methods. The electron microscope is a dangerous *additional* tool, and more and more artefacts are being studied.

Undeniably electron micrographs and methods of differential staining enrich knowledge of bacterial structure. The danger is that the resulting pictures are not usually interpreted from what can be made visible in live preparations, the reason being that live preparations of bacteria are rarely studied. Dark-ground microscopy, the method of choice for this purpose, has been abandoned by most workers through lack of a suitable light source. For a number of years I have used (South African) sunlight, which is about the brightest light source available. As a result of examining thousands of preparations of live bacteria I have concluded *that at least the* motile "bacteria" are not rods, but spirals. During activity they present themselves *as rotating, gyrating, undulating,* spiral bodies, and their cell walls are by no means rigid. A comparison with "spirillums" showed that there is little to choose between the living shapes of "bacteria" and "spirillums," except perhaps in length and amplitude of coils. Further observations convinced me that bacteria have no outside motor-organs, and that the wavy structures commonly called "flagella" are pure mucous twirls which occasionally peel off from the mucous coat through the very movement of the bacterial body.[2] A ciné-micrographic film (1400 ft) illustrating *all this is available in Britain through Dr. W. E. van* Heyningen, hon. secretary of the Society for General Microbiology, Sir William Dunn School of Pathology, Oxford. An abbreviated copy (750 ft), which may serve as an introduction to the subject, is with the Royal Microscopical Society.

Obviously, if my views are correct the difference between "bacteria" and "spiral forms" largely falls *away, and "bacterial flagella" are no more.* This would disturb fundamental conceptions of bacterial morphology, and a thorough revision of nomenclature and classification would become necessary. This brings me back to my starting-point—that efforts at bacteriological systematics are premature.

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CARS FOR DOCTORS

SIR,—I am afraid Mr. Gresham Cooke's remarks have done little to brighten the prospect for those of us who *have been nursing and cajoling ancient* cars into a semblance of roadworthiness, while patiently waiting for the "really early date" at which the "high degree of preference" we enjoy would bring the new car.

Mr. Cooke will agree that a few instances of abuse must not be allowed to set the pace for the machinery whereby priority is given effect, and the present machinery is faulty partly because abuses are possible *at all. If doctors are to accept* some 4000 patients under contract with the Ministry of Health (would Mr. Cooke advise against this on the ground that—human nature being what it is—they might *all* decide to be ill at once?), efficient transport for doctors must be taken for granted, and the question of what constitutes a serviceable car for a doctor must be settled without delay and with precision.

I suggest that a "serviceable" car is the car Mr. Cooke would wish his own doctor to have when he needs him urgently—when for instance he has met with an accident *and is bleeding from a severe head* wound. Neither Mr. Cooke nor Mr. Bevan would *accept* the plea that the car only needs "*a little attention*" as an excuse for *neglecting the call*; nor would any doctor neglect it, although his job is made doubly anxious and difficult by an unreliable car. To wait until the car will not run *at all*, and will therefore pass muster as "unserviceable" is obviously fantastic. No-one needs a doctor with an *unserviceable car*, and the doctor would rightly be accused of negligence if he pretended to run a practice with it. He should be given every assistance in avoiding the catastrophe; and what help is he in fact getting?

He must have the formal sanction of the B.M.A. (so formal that it amounts to testifying that the doctor is a doctor), but he *can only get this* by first persuading the garage which normally handles his car that she is more trouble than she is worth. The garage provides a kind of "disability certificate" by which it implies that the car had better be replaced. In requesting the garage proprietor to give this, one is asking for more

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is asking the proprietor to deprive himself of a
ble source of income, while circumstances, Authority,
"nature" prompt him to keep it. This is far too
y a responsibility for him (quite apart from any
tion he may have for his ever-ailing patient), even
he prophet enough to know at what point exactly
ar must be condemned in order to avoid disaster in,
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17) has emphasised. a consideration of the previous
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ndon, W.2. J. DONALDSON CRAIG.

SUPERANNUATION

R.—By now most doctors will have had a chance
udy the Ministry of Health's leaflet S.D.D.. containing
provisions by which practitioners holding life-
ance policies can "opt out" of the National Health
ice superannuation scheme. Many will have read
the excellent article by Mr. A. N. Dixon. manager
he Medical Insurance Agency. published in the
sh Medical Journal supplement of July 3, 1948.
hose who are still considering whether to enter the
rannuation scheme or rely on life-assurance policies.
ould point out that delay is inadvisable, since the
on will lapse on Oct. 4.

order to use this option a practitioner must have
in force on July 5, 1948. an endowment assurance
y. maturing not earlier than age 60. on which a
nium of at least £50 per annum is being paid. If
premium is less than £150 he must take out a further
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rity for loans obtained for purchasing their practices.
n policies cannot be used to provide for their super-
uation—which is perhaps unfortunate. particularly
o many of these policies contain a provision whereby
could later be modified to endowment assurance
ch would meet the requirements of the National
lth Service (Superannuation) Regulations. They
be used only if the practitioner is able to secure
signment of the policy to himself before Oct. 4.
s should be clearly understood. for I feel sure that
rge number of practitioners who are intending to
on their life assurance will not qualify to do so
use of this restriction.

hat many will wish to opt out there is no doubt:
excellent though the superannuation scheme is. it
deficiencies at this stage which will be obvious.
icularly to a young practitioner with family responsi-
ies. Briefly. these deficiencies are: (*a*) inadequate
ision for the widow throughout, and during the first
years' service no provision whatever: (*b*) on retire-
t compulsory acceptance of a pension. though the
ment of capital would be far more acceptable in
y cases—e.g.. for a retiring practitioner in a poor
e of health. or for one who wants to live outside the
ted Kingdom income-tax area. A practitioner
ing on life assurance is able to counteract these
ciencies in the scheme. and the accompanying table
help those who are still undecided as to what they
uld do. In considering this table. it should be remembered that the life-assurance rates are those obtainable at present. and the pension quoted is the one that most leading life-assurance offices will be prepared to guarantee now. The comparison is based on equal contributions to the National Health Service scheme and to life assurance. In the case of life assurance I have assumed that a practitioner will take the obvious advantages of a "with profits" contract. and I have estimated the bonus conservatively.

The table illustrates the case of a doctor aged 35, with a wife of the same age. and an income (after deduction of expenses) of £1200 per annum. Under either scheme the total contribution is £168, of which he pays £72 and the Minister pays the remainder. Under the N.H.S. scheme he receives full tax relief on his share. but under the life-assurance scheme two-fifths' tax relief. The life-assurance policy is for £4500 with profits.

Years of service	N.H.S. scheme				Life assurance		
	Cash at death	Widow's pension	Cash at 65	Pension at 65	Cash at death	Cash at 65	Pension at 65
		(p.a.)		(p.a.)			(p.a.)
1 ..	£72	..	..	..	£4500	..	..
3 ..	£223	..	..	..	£4702	..	..
5 ..	£1200	..	..	..	£4837	..	..
10 ..	£180 +	£120	..	..	£5175	..	..
15 ..	£270 —	£120	..	..	£5512	..	..
20 ..	£360 —	£120	..	..	£5850	..	..
25 ..	£450 —	£150	..	..	£6187	..	..
30 ..	£540 —	£180	£540	£540	£6526	£540	£552

Under the N.H.S. scheme. if a practitioner dies after retirement. his widow will receive for the rest of her life one-third of his retirement pension: but this of course ceases immediately on her death. Under life assurance, on the other hand. pensions can be guaranteed for a fixed period. and a retiring practitioner could elect to accept a pension which would be guaranteed for 15 years. regardless of survivals. Unlike those we have previously considered. such a pension during the guaranteed period would not be subject to tax. and if accepted on this basis it would amount to £392 per annum. If the practitioner survived more than 15 years after retirement. this pension would continue to be payable during his life-time. but would attract income-tax after the guaranteed period had expired. If income-tax is assumed at the modest rate of 7*s.* in the £, a pension of £540 per annum will give the possessor £351 per annum. For the first 15 years, therefore. the practitioner would be financially better placed if he accepted the pension for the guaranteed period. If he died soon after retirement his widow would receive the full pension till the end of the 15 years, and in this way his capital would return to his estate.

I do not intend these observations to be construed as a recommendation to opt out of the N.H.S. superannuation scheme, but rather as a guide to practitioners who can fulfil the qualifying conditions and want to decide what is best suited to their circumstances. Many who do not at present qualify to opt out may find that it is not too late to modify their policies—e.g.. by altering the endowment period or by reassigning the policy—which will enable them to exercise free choice of method.

A. SHAW
Liverpool. Medical Agent and Medical Insurance Consultant.

THE editor of the *Medical Directory* writes: "To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid we will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification." The directory is published by Messrs. J. & A. Churchill, Ltd., 104. Gloucester Place, London, W.1.

PREVENTION OF PNEUMOCONIOSIS

SIR,—After perusing recent articles on pneumoconiosis one is again lost in wonder that no mention is made of the simple and sure means of prevention and protection—the use of a small light pad over the nose and mouth, as worn by nurses in the operating-theatre and children's wards. The pads are, of course, merely some six folds of butter-muslin or gauze, with tapes to tie behind the head, and could be provided in unlimited quantities, to be discarded after use.

By all means let us diminish or eliminate, as far as possible, the creation of dust and grit in trade processes and mining; but surely real prevention of anthracosis, silicosis, or any form of pneumoconiosis can only be obtained by providing exposed workers with a shield which will prevent any dust particles from gaining access to the respiratory system.

The director of the Pneumokoniosis Research Unit states that pneumoconiosis is a preventable disease, and calls for imperative administrative action. Is it too much to hope that such action might be directed towards preventing the condition, by the simple expedient suggested, rather than towards setting up a costly organisation to deal with the crippling and often fatal after-effects?

LEONARD HEARN
Senior Tuberculosis Officer
Nottingham. Notts C.C.

OPERATIONS FOR HERNIA

SIR,—In reading the interesting article of Moloney, Gill, and Barclay in your issue of July 10, I am reminded by their report of scrotal hæmatoma in 2 of the 230 cases discussed that this serious complication, with the almost inevitable sequel of infection, has not yet been eliminated from even the best of surgical practice.

Some of your readers may be interested in a simple bandaging procedure which I have used, with invariable success, during the past five or six years in all cases involving extensive separation of the cord and testicle from the scrotal wall.

At the close of the operation the incision is dressed, and the dependent part of the scrotum is picked up by an assistant between finger and thumb. A strip of elastic adhesive bandage about $1\frac{1}{2}$ in. wide and about 12 in. long is wound in spiral fashion around the scrotum from apex to base, obliterating the scrotal cavity by light and even compression (fig. 1), and so rendering the formation of a hæmatoma virtually impossible. The testes are thereby displaced towards the external inguinal rings. The spiral bandage must be retained in position by a strip of elastic adhesive bandage of similar dimensions extending from the perineum over the scrotum to the anterior abdominal wall (fig. 2). After three or four days the strapping may be released and a simple support substituted. The testicles soon regain their normal position.

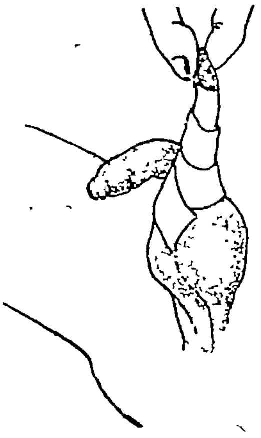
Fig. 1

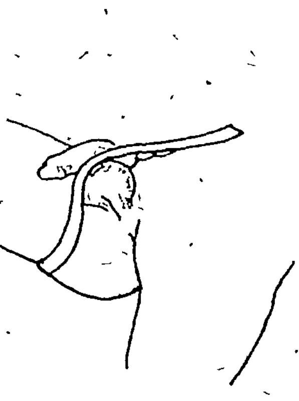
Fig. 2

Other methods have not proved satisfactory. For example, in one case in which the scrotum was stitched to the skin of the lower abdominal wall, the formation of a stitch abscess resulted in infection of the entire sc cavity.

I am indebted to Miss Barbara Duckworth for illustrations.

NORMAN GIBBON
Registrar to the surgical professorial u
Department of Surgery, University of Liverpool.

SIR,—The admirable article (July 10) by Mol and his colleagues on the nylon darn for hernia re an old method in a new look. Thirty years ago Sam Handley[1] described his darn and stay-lace method the radical cure of inguinal hernia. As one of his sur dressers I saw many of his cases, and the results w excellent. The material used was silk, and whilst th was occasional trouble from infection it was found t this could be avoided by soaking the silk in flav 1 in 1000, before use. The principles of the operati were the same as those now advocated—the avoidar of tension and of the displacement of normal structur The darn was used to strengthen the external obliq which Handley contended was often stretched a split, and for which no provision is made in the pre operation. The deeper layer of the darn in Molon operation was the stay-lace in Handley's and the latt seems a more appropriate name for it; perhaps sta laces are no longer in fashion in the new look.

London, W.1. E. W. RICHES.

PAIN

SIR,—In his interesting paper published on July 3, Dr. Keele rightly emphasised the value of pain as an aid to diagnosis, and in particular, he drew attentio to the help which may be gained from consideration of the time-intensity curve. It is agreed that in s conditions as angina pectoris, duodenal ulcer, thro angiitis obliterans, and some forms of sinusitis t information thus obtained is often enough to ena positive diagnosis to be made. Dr. Keele's views on he terms "psychogenic pain" may not, however m the same ready acceptance.

The term "psychogenic pain" is a bad one, be applied, as it often is, to a multiplicity of condi in which the diagnosis may be obscure. Further, ev pain is in a sense at least partly psychogenic, in that is a psychosomatic experience, the reaction to which determined not merely by the nature and severity of the pain but by all the related circumstances and particular by the general make-up of the individual concerned. As Leriche[2] has remarked, "Physical pain is not a simple fact of nervous impulses travelling over a nerve at a predetermined gait. It is the result of the conflict between the stimulus and the individual." Generally speaking, pain is not a prominent feature of purely neurotic states. The hysterical individual, fr from organic disease, who proclaims the agony of h pains in extravagant terms can hardly be regarded a suffering from pain in the generally accepted sense of the term when one views the happy mien of his coun tenance, or considers "la belle indifférence" with wh he accepts his misfortunes. In the anxiety state local cause for pains can generally be discovered: hea aches may be due to subconsciously maintained, persis scalp contraction; the low backache of many neuro women is only what one might expect from the droop posture they maintain; local muscular pains can re from prolonged tenseness; intestinal disorders are o the result of emotionally determined derangement function and so on. Pain, though appreciated central usually arises peripherally.

The extent of the reaction to all pain is determ by the factor of attention and by the emotional sta So it is that suggestible, neurotic patients may resp badly to the experience of pain and benefit tempora from purely psychological influences. Similarly, the s of a dentist's-chair may abolish the toothache of normally stable individual, even although the pa originates in an obviously carious tooth. For the reasons one should not attach too much diagnos

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1. Handley, W. S. *Practitioner*, 1918, 100, 466.
2. Leriche, R. Surgery of Pain. London, 1940.

. ANEURIN BEVAN, Minister of Health, said that e case of any drug there would always be a time-)etween its discovery, its announcement to the ɔal press and to scientists generally, and its pro-)n and use throughout the whole health system. s most undesirable that where that inevitable time- ok place there should be sensational propaganda st the administration alleging that people were because it was not available and at the same time ıg false hopes and fears in the breasts of those were most concerned about individual cases. It)erfectly true that the use of streptomycin was still early stages, and it had to be used carefully because toxic effect. It was also desirable that it should ɜed under hospital conditions and preferably with atory controls. It was, however, a fact, now lished by the Medical Research Council, that culous meningitis did react in some instances ırably to the use of streptomycin. It was not yet n in all these cases, until sufficient time had elapsed, her there would be a relapse. But in about 31% e cases hopeful results had been realised. During investigations quite naturally the therapeutic f streptomycin was restricted. That was inevitable it had been found to be safe to use it clinically. that it was established, however, that streptomycin efficacious to some extent both for tuberculous ngitis and miliary tuberculosis, arrangements were ; made to provide treatment for as many cases as ble of these conditions. These arrangements would apply if the value of streptomycin was reliably n in other cases. There were known to be a number ther borderline conditions where streptomycin 't be efficacious, and the developments were therefore ; on. The supply was being planned and British uction increased to meet all these needs.

l the regional boards, Mr. Bevan stated, had been l to say at what hospitals and sanatoria, with uate staff and facilities, these cases were or could be ght together. Twenty-six such treatment centres already been provided. As soon as the information available as to where additional centres were to be lished, supplies of streptomycin would be provided them. Arrangements had been made to supply tomycin for cases in other hospitals if there was ed for them in a recognised centre. A doctor at hospital could get streptomycin for these types of by applying to the Ministry of Health supplies on.[1] From July 14 to 19 1150 grammes of strepto- ı had been supplied in response to 25 requests of ind.

nical trials now suggested that cases of tracheo- chial tuberculosis should be brought within the ment scheme. Regional hospital boards had there- been asked to say which hospitals should receive lies of streptomycin for this purpose. An expert cal committee was being set up to advise what other s of case should, in the light of clinical trials, be ght within the scheme, and arrangements would be ıded on the basis of their advice. It was estimated in order to treat all cases of miliary tuberculosis, rculous meningitis, and tracheobronchial tuberculosis ıe country, not more than 40 kg. of streptomycin d be needed every month.

om November, 1946, until now, including 50 kg. h was arriving in August, 300 kg. of streptomycin been imported from the United States, at the cost of)00 dollars. A further 50 kg. was on order. Large- production of streptomycin in this country was beginning. On May 8, firms engaged in this work asked to take all possible steps to speed up progress, eport difficulties, and to ask for any help needed in ing plant and raw materials. It was expected that tal of 25 kg. would be received (packed, tested, and y for use) this month and at least 50 kg. in August. luction should reach 100 kg. a month by the autumn. ırther plant with a much larger capacity should come operation early next year. These supplies would e than meet the needs of all cases where the use of ptomycin was so far recommended, and would enable tment to be extended to other types of cases as expert ice favoured it.

Bread Rationing

On July 21, Mr. JOHN STRACHEY, Minister of Food, informed the House of Commons that the present system of bread and flour rationing, together with the restrictions on the serving of bread in restaurants, would end on Sunday, July 25. Even today, he said, the quantity of wheat available in the world, and our own ability to command the foreign currencies necessary to purchase it, were strictly limited. Hence the Government did not now propose to return to the unrestricted sale of bread and flour for any purpose—whether for human or for animal consumption—which the purchaser might choose. The delivery of flour from mills would be controlled administratively by the Ministry in such a way as to keep the rate of offtake from July 18 at approximately the same level as during the previous twelve months. There could be no justification for the use of bread or flour for feeding livestock; and to assist the retailer in preventing the purchase of flour by his customers for this purpose the purchase or sale of more than 28 lb. of flour by retail at any one transaction would be forbidden. Very appreciable savings had been made in the first year of bread rationing, which was the most critical period; there was little doubt that without rationing we should have suffered a breakdown in the supply of bread to the population in April or May, 1947. Even in the second year, when rationing was probably having little effect on the level of human consumption, it still served to limit the feeding of bread and flour to animals. The total offtake remained, on average, between 1000 and 2000 tons a week below the pre-rationing level.

QUESTION TIME

Private Patients and N.H.S. Medicines

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health why patients of doctors who remained outside the National Health Service were debarred from receiving free medicines, although eligible for free treatment in hospital; and whether, in the case of those patients who had paid the full contributions under the National Insurance Act, 1946, including the contribution in respect of the health services, and had also paid that part of the cost of health services derived from taxation, he would include free provision of medicines as well as of hospital services to patients of doctors not participating in the National Health Service—Mr. BEVAN replied: The diagnosis of what is needed, its prescription, and its provision, must be treated as part of one process. I could not justify separating the prescription from the medicine in this way.

Doctors in Rural Areas

Major TUFTON BEAMISH asked the Minister of Health whether he was aware that owing to the fact that no travelling allowances were paid to doctors for visiting patients in their homes, doctors in rural districts were obliged to refuse registrations from persons living more than a short distance from their surgeries; and whether he would take steps to prevent the health of the rural community suffering in this way.—Mr. BEVAN replied: Special payments (the details of which are under discussion with the British Medical Association) will be made to meet such cases. There is no financial justification for a doctor to refuse a patient in the circumstances described.

Doctors' Remuneration

Dr. SANTO JEGER asked the Minister whether he was aware that many doctors who had joined the National Health Service were in serious financial difficulties because their income from private patients had largely ceased, their panel cheques paid early this quarter had been exhausted by their regular commitments, and they had no current money to meet day-to-day expenses; and whether he would therefore arrange for doctors to receive interim payments, on account of their basic salary or otherwise, to bridge the interval until their next regular payments were due.—Mr. BEVAN replied: I do not think there can be many such cases, but I am proposing to arrange for advances to be made in cases of special hardship.

N.H.S. and Drugs and Appliances

Mr. H. E. RANDALL asked the Minister of Health if doctors, under the new health service, would be free to prescribe for the patients, without restriction, every kind of drug and appliance necessary for their treatment and would not have

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[1] The telephone numbers are given on p. 203.

Medicine and the Law

Alleged Neglect of Mental Defective

Several doctors gave evidence, some of it conflicting, at the Hertfordshire Quarter Sessions, on July 12, when Miss G. E. Sherwood, a children's nurse, aged 60, who keeps a home at Potters Bar for mentally retarded children, was accused of neglecting an 8-year-old boy in a manner likely to cause him unnecessary suffering or injury. She pleaded not guilty.

Mr. W. D. Bedford, surgeon to Hertford County Hospital, said that when he examined the boy in the hospital after his removal from the home he found him to be extremely wasted and emaciated, and suffering from tuberculous peritonitis caused by starvation.

Dr. Joseph Dwyer said he had examined the child some time before he went into the home, and found him fit, apart from congenital heart disease. On March 5 last, in answer to a request from the child's mother he telephoned Miss Sherwood that he would like to examine him again, but she would not permit it, as she had her own doctor. He later examined the boy in his own home, and finding alarming emaciation with a huge abdomen he suspected tuberculous peritonitis. The child's skin was dirty yellow, with fine powdery scales, indicating, Dr. Dwyer said, that he was suffering from a shortage of vitamins. Numerous ecchymoses on the legs were attributable not to any injury but to his condition. He thought the boy would not have survived another six weeks at that rate. His weight was then 28 lb. After removal from the home his weight rose by March 20 to 40 lb. In his opinion the emaciated condition was due to malnutrition from deprivation of food. He did not think that the shape of the boy's head indicated that he had had rickets.

Dr. J. R. F. Innes, house-surgeon at Hertford County Hospital, said the boy was put to bed when admitted to the wards. Radiography revealed no sign of organic disease. He was not given any specific treatment, but vitamins, fresh food, and fresh air, to which he responded well. The distension of the stomach subsided.

Mr. King-Annington, defending counsel, asked the jury why a woman who had spent fourteen years as a nurse for mentally retarded children, should deliberately starve this child. What was her motive? It was to her interest to look after him. The prosecution said the child was starved of food. The defence was that he was given the food and ate voraciously, but that he was unable to derive the benefit from his food which a normal child would have done. There was a family history of diabetes, of which his father had died, and his mental defect was associated with metabolic disturbance and breakdown in assimilation. The fact that he had dropped weight did not mean that he was starved. There was also the factor of emotional disturbance.

Miss Sherwood, in her evidence, said that in her home there were seven other children, and none of their parents had withdrawn them. When the boy came to her he was very thin in the limbs, and his hands were like claws. He was seen by a doctor every month. His right eye was discharging and he had catarrh. She denied starving him, and said that on the contrary had done her best for him.

Dr. A. F. Tredgold, who had examined the boy on July 6, put him in a low-grade mental category; he could understand only a few simple requests and his speech was limited to a few words. His stature and state of nourishment were below that of a normal child of his age. The skull was square and irregular and bossed and suggested that at some time he had had a mild attack of rickets. Asked if the boy's condition suggested that he had been starved, Dr. Tredgold replied that it depended on the way the word starvation was used; if in the popular sense, as meaning the withholding of food, then he would say no; but if in the medical sense, as meaning the inability of the tissues to absorb food, he would say yes. In his opinion the loss of weight was due primarily to the condition of the brain, with the condition of the heart as a secondary factor. He had spent some time in the home and formed the impression that Miss Sherwood was kind-hearted and devoted to the welfare of the children and anxious to do all she could for them and their mental develop- The other seven children appeared well cared for

The chairman of the magistrates said there three possible reasons for the boy's condition: (1) t he was not given sufficient food; (2) that he suff from tuberculous peritonitis; and (3) that owing defective metabolism he was unable to assimilate food. He asked whether Dr. Tredgold thought (3) likely than the others. Dr. Tredgold replied "Not likely, but the only one." Quoting from the section low-grade mental patients in his own textbook he out: "Assimilation was so defective that in spite of abundance of food they remained stunted and un nourished." Dr. Ernest Taylor, medical superinten of Middlesex Colney, agreed with the evidence given Dr. Tredgold.

Dr. J. Dalziel, the doctor who attended the b once a month, said that Miss Sherwood had drawn attention to the fact that the boy was thin and he recommended that he be given extra sugar; his app was good. He had found Miss Sherwood exceptional conscientious, and if he had a child he would have hesitation in sending it to her home.

The Chairman said the child was in a serious conditi and asked Dr. Dalziel whether he considered the respon sibility lay with him or Miss Sherwood. Dr. Dal said he accepted responsibility in the light of events.

Dr. William Horner, of Surrey, said that a grands was in Miss Sherwood's home and he was quite satisfied with the boy's condition and treatment. The child's father was also a doctor. Mr. Richard Harrison, an author, had volunteered to give evidence because he had a son in a similar condition. Last September he had the child taken to an institution, and after a week there was deterioration and loss of weight. He was informed that it was due to the new environment and that the child would pick up when it adjusted its The child was scarcely able to stand or walk. It h received every care and plenty of food, but still contin to lose weight.

After a hearing lasting two days, the jury fo verdict of guilty, and Miss Sherwood was senten one day's imprisonment. Notice of appeal has been

Parliament

Steptomycin Supplies to Hospitals

In the House of Commons on July 21 Mr. S. T. Swingler called attention to a case in which a doct at the Staffordshire Infirmary, who applied urge to the Ministry of Health for a supply of streptomyc for the treatment of a young girl suffering from tub culous meningitis, was refused on the ground that t Staffordshire Infirmary was not one of the hosp authorised to have a supply of the drug under the Med Research Council. The patient, it was stated, must sent to the nearest authorised hospital—namely, t Queen Elizabeth Hospital in Birmingham—but o inquiry there he was informed that, though there a supply of streptomycin, there were no vacant be The girl's parents and the hospital authorities t appealed to Mr. Swingler for assistance, and on app tion to the Emergency Bed Service in London he w told that there were no immediate vacancies in of the hospitals which had streptomycin and that t fore it was a question of waiting. After 24 h discussion the Minister of Health authorised the s of streptomycin to Staffordshire Infirmary. For those concerned were very grateful. At the same t a private gift of streptomycin was received from ab from a generous American. While making no crit whatever of the N.H.S., because the problem before its inauguration, Mr. Swingler urged that kind of administration must be flexible and fast-mo where urgent cases were concerned.

Colonel M. Stoddart-Scott asked the Minister to whether streptomycin was now the acknowledged tr ment for tubercular meningitis. About two y ago the Minister discouraged its use in this country it had passed through *certain* tests. Had those t proved satisfactory, and did the Minister not recomm its use wherever possible?

Notes and News

STREPTOMYCIN

e House of Commons last week, as reported in our entary column, Mr. Aneurin Bevan said that supplies tomycin are now obtainable from the Ministry of for the treatment of miliary tuberculosis and tuber- eningitis. Between 8.30 A.M. and 6 P.M. on weekdays 1 8.30 A.M. and 2 P.M. on Saturdays) the telephone for such applications is KENsington 3471 (extension t all other times (night and weekends) the number is all 4300.

PAY OF STUDENT NURSES

s last meeting the Nurses Salaries Committee, which ised the Minister of Health since 1942, recommended pay of student nurses should be increased by £15. nister has accepted this recommendation and the will have effect from July 5. Student nurses from t London hospitals on July 23 sent a letter to the and to the General Nursing Council asking if a on could meet representatives of the Ministry to the whole question of their salaries. They consider increase is insufficient as they will now pay £18 a National Insurance. At a meeting of 800 nurses held Royal College of Nursing on the same evening (*Times*,) it was explained that the proper procedure now e for the nurses to register their complaints through dent Nurses' Association, when their proposals would with by the Whitley Council for midwives and nurses, eld its first meeting on July 21.

HELP FOR ALCOHOLICS

HOLICS Anonymous, the society run by recovered es to help others to overcome alcoholism, has often ntioned in our columns. On July 15 a public meeting d by members of the London group of the society, at members and their friends, about twenty doctors, and s of the press were present.

Marty Mann, executive director of the American l Committee for Education on Alcoholism, and one of three U.S. government delegates to the Inter- l Congress on Alcoholism, at Lucerne, told how, nine go, the society was able to help her to recover from alcoholism. After five years of sobriety she con- he idea of the national committee, of which she is the It was launched under the sponsorship of Yale Univer- 1944, as part of the Yale "plan on alcoholism." In n to the committee this plan covers publications (such nal studies, monographs, research projects, and ets), a summer school on alcoholic studies, and a or diagnosis, treatment, and research. The com- task is to teach the general public that alcoholism is e, and the alcoholic a sick person who can be helped worth helping; and that—in America, at all events— sm is a public-health problem and therefore should be ic responsibility. Mrs. Mann has lectured to non- es in cities and towns all over the United States and re, and has been responsible for starting many local tees. It is not unusual, it seems, after she has lec- n a city for the membership of the local Alcoholics nous group to double or even treble. Alcoholics of years' standing, who have been unwilling to admit ndition, find the courage to join the society and to y its help.

ERNATIONAL POLIOMYELITIS CONFERENCE

First International Conference on Poliomyelitis, held York this month, was attended by some 2000 delegates; the words of a *Times* correspondent (July 22), though olutionary discoveries were announced, "much dead- n research at all stages was cleared away." The theory e diversity in epidemiology is due to a change in the host rather than in the virus was again voiced by Albert B. Sabin, of Cincinnati, who suggests that the ce in resistance between different peoples is due to variations in environment. A call for better organisa- d more careful selection of treatment was made by L J. Seddon, who pointed out that there seems to be ntific justification for most of the preventive measures o control outbreaks. Quarantine, he said, has a ive effect on community life and

lost out of proportion to its possible benefit. He favours only the most obvious measures of prevention, which should be organised by a "general staff." Another delegate advocated an educational programme directed at the community in general and not simply at those with the disease in the family. As things stand, families develop a feeling of responsibility for the illness, and there is also great stress when the child returns home after months in an institution; some 38% of the cases investigated exhibited behaviour problems on returning home. Experimentally, Dr. Isabel Morgan, assistant professor of epidemiology at Johns Hopkins University, has obtained complete immunity in a high percentage of rhesus monkeys injected intramuscularly with a live virus of Lansing and Brunhilde strains. Protection, says the *Times* report, was achieved by overproduction of antibodies, which caused them to "spill over" into the central nervous system. The administration of pentnucleotide and yeast nucleic acid has been found to protect up to 90% of mice exposed to experimental infection. At the Philadelphia Children's Hospital there have been trials of oxythiamine, an analogue of thiamine and nitrous acid, which produces a deficiency of vitamin B_1; in mice its administration produced an almost immediate increase in resistance to the virus.

University of Manchester

The following appointments are announced:

Dr. H. T. Howat, lecturer in medicine; Dr. H. J. Wade, hon. clinical lecturer in medicine; Dr. G. G. E. Smyth, lecturer in medical neurology; Mr. H. P. Lawson, lecturer in otolaryngology; Dr. A. Holzel, lecturer in child health; Dr. Fred Stratton, special lecturer in human serology; Dr. Harold Jackson, hon. lecturer in experimental and radiation therapeutics; Dr. H. S. Barber, assistant clinical director of chronic rheumatism research centre; Dr. Oscar Janns, chief assistant in chronic rheumatism research centre; Dr. J. S. Lawrence, physician in charge of rheumatism research clinic; and Mr. F. H. Scotson, clinical lecturer in surgery for dental students.

Royal College of Physicians of Edinburgh

At a meeting of the college on July 20, with Dr. W. D. D. Small, the president, in the chair, Dr. D. R. Maitland and Dr. E. K. Morris were introduced and took their seats as fellows.

The following elections were made:

Fellows.—J. Laurie, W. M. Wilson.

Members.—D. R. MacCalman, J. G. A. Davel, H. D. Jenner, J. Sandilands, I. C. Gilliland, E. M. Donaldson, P. W. Hannay, V. V. Shah, J. Green, J. S. Theron, R. W. Biagi, D. I. McCallum, T. Parkin, A. R. Wilson, A. A. C. Ross, Amy Jungalwalla, D. M. Forsyth, N. C. Begg, D. S. Harling, R. G. Mathers, E. V. B. Morton, J. K. Scott, J. A. Tulloch, D. Naidoo, J. A. Morton, D. Banerji, T. W. G. Kinnear, A. M. Kassim, C. F. Rolland, A. C. Arthur, H. D. Ritchken.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on July 24, with Sir William Gilliatt, the president, in the chair, the following officers were re-elected: president, Sir William Gilliatt; vice-presidents, Sir William Fletcher Shaw, Mr. J. M. Wyatt; treasurer, Mr. A. A. Gemmell; hon. secretary, Mr. H. G. E. Arthure; librarian, Mr. F. W. Roques; curator of the museum, Mr. Aleck Bourne.

The following were admitted to the fellowship:

Francis Richard William Kinkead Allen, James Bruce Dewar, Peter Joseph Kearns, Hector Ross MacLennan, George Randolphe Sparrow.

The following were admitted to the membership:

S. G. Aitken, Islay C. Barne, Wallace Barr, Fred Benjamin A. B. Higginson.

The following were elected to the membership:

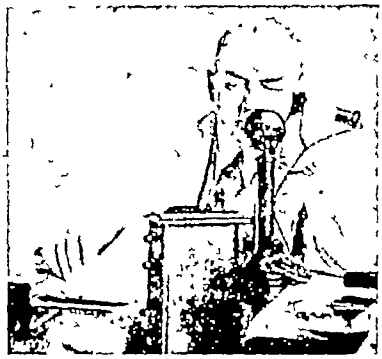
T. M. Abbas, I. S. R. Bain, Henrietta E. Banting, T. L. S. Baynes, Samuel Behrman, D. C. A. Bevis, C. C. Bowley, T. St. V. W. Buss, L. W. Cox, T. E. Elliot, P. M. Naidu, Mary E. Egerton, Margaret Fitzherbert, G. McI. Forsyth, H. D. Freeth, G. B. Gibson, J. H. Gibson, Andrew Graham, A. H. Grenz, Constance A. Grey, H. B. Hattam, C. C. Henneberg, Ebbie Hesselberg, D. W. Higson, J. C. Holman, K. R. Hudson, A. G. Jones, J. B. Joyce, R. A. Irani, W. T. Kenny, G. G. Kerster, R. A. H. Kinch, Samuel Lask, T. L. T. Lewis, Ethna W. Little, E. L. F. McConnachie, William Macfarlane, J. M. McKiddie, S. H. Madden, Helen M. Mayer, G. W. H. Millington, F. L. E. Musgrove, C. G. Nairn, J. R. Norris, J. J. F. O'Sullivan, J. H. Patterson, A. C. Pearson, W. H. Peek, S. D. Perchard, David Prysor-Jones, M. S. Qureshi, E. H. Rees, S. McR. Reid, H. A. Ripman, D. N. S. Robertson, Helen M. Russell, B. W. Sanderson, Humara Sayeed, S. A. Siddiki, G. A. Silley, A. A. Smith, Tom Smith, G. J. Sophian, Christine M. Stacey, P. C. Steptoe, C. S. N. Swan, R. A. Thatcher, G. S. Thomas, R. G. Whitelaw, P. de S. Wijesekera, R. M. Williams,

to work within the limits of averages of cost per insured person.—Mr. BEVAN replied: A doctor has a duty to prescribe under the National Health Service all drugs necessary for the proper treatment of the patient without any limit of cost whatever, also the appliances prescribed in the General Medical and Pharmaceutical Regulations. Other appliances are obtained through the hospital service.

Obituary

THE LATE DR. GOODHART

I. B. M. writes: G. W. Goodhart was essentially a clinician at heart and was one of the early band of clinical pathologists who took pathology to the bedside, although, as he himself has said, "clinical describes not the place where the investigation is made, but the purpose that is in view in making it." It can be said that in more senses than one he was a direct descendant of the Guy's physicians of the older school. He was not, in the strict sense of the word, a scientist; rather had he a fund of clinical sense, and common sense. It was this that made his opinions so valuable to his colleagues, maintaining as he did that "pathology is and must remain the rock on which the house of medicine is built." His loyalty to those who had been his seniors, and to his juniors—the latter one of his most striking characteristics—inspired complete confidence and very real affection. There can be no doubt that the large measure of success that the L.C.C. pathological services have achieved has been due to the careful selection of the first group pathologists of whom Goodhart was one; and those of us who worked in his department owe him a great debt. He was fond of talking and although one learnt the wisdom of allowing more time for a conversation with Goodhart than with most people, the time spent was never wasted, and one never left him without feeling the benefit of his wisdom and being refreshed by his humour. Very rarely did he say anything derogatory about anyone; he had the habit of finding and praising good points which others might have missed. His easy-going geniality made him very approachable, and he had the knack of making imagined trouble or disaster mere trivialities. His first few words would minimise them and put them in the right perspective. At the same time he went straight for essentials, and he knew what was fundamentally important and what was not. To say that he was easy-going is not to belittle him: humbug and deception he spotted at once and dealt with severely if need be. His laboratory was not complete without his own cheery figure and warm-hearted smile, and his juniors felt as if they were guests there; in consequence he got the respect he deserved, and the happy atmosphere which was so apparent was due to the fact that his assistants worked well because they liked working for him.



His philosophical fortitude during his illness did not surprise those who knew him well. He realised how ill he was and the inevitable outcome, but his spirit never left him; rather did it seem enhanced. His characteristic courage was never better seen than in his presence at a Guy's Club dinner a little more than a month before his death. He was devoted to his family and by them and his many friends he will be sadly missed. Those of us who have been fortunate enough to know him well and to work with him cannot but feel his influence now and always. It is to be hoped that the type of Christian gentleman personified by G. W. Goodhart will still be found among the rising generation in this materialistic age.

FARQUHAR McGILLIVRAY LOUGHNANE

F.R.C.S.

Mr. Farquhar Loughnane, surgeon to All S Hospital and consulting urologist to the London Co Council, died in London on July 14 at the age of 6

He was educated at Clapham College, King's Co London, and St. Thomas's Hospital, where he entrance and Peacock scholarships and won the trea gold medal. In 1912 he obtained the Conjoint qual tion and two years later the F.R.C.S. After ho resident appointments at St. Thomas's, the Royal Bathing Hospital, Margate, and Camberwell Infir and also at Salford and Leicester, he served as a sur with the British Red Cross in France, and later with R.A.M.C. as a surgeon specialist in Mesopotamia

Besides his appointment at All Saints, Lou was assistant urologist at the Prince of Wales's Hos Tottenham, and surgeon to St. Mary's Hospital, Plais To this last hospital, where he had worked for 25 ye he was especially generous of his time and thou serving on the board of governors and on many co mittees. With his background of war experience had wide surgical interests, and he had written on diverse topics as spinal tuberculosis and frost-b but it is as a urologist that he will be chiefly remember His *Handbook on Renal Surgery* appeared in 1926, a he published many papers on different aspects of h specialty, notably genital tuberculosis and prostatectom

W. P. G., a colleague at Bethnal Green Hospital where Loughnane was appointed consulting urologist in 1933, writes: "As a cystoscopist and intravesical instrumentalist, he was seen at his best; the speed and precision whereby he could remove a prostate with the resectoscope, was a revelation. To his juniors he w kindness itself: it was always the youngest memb of the team who passed the cystoscope for him, and h went to great pains to demonstrate cystoscopic app ances to junior nurses. After the weekly clinic ca the inevitable cup of tea and the informal conference, at which he would come under a barrage of questions. He was not easily know once his confidence had been gained he prov a delightful friend and agreeable colleague. I young days he had been a keen golfer, but toward end he got caught up in that most enthralling of h —restoration of old country cottages. He liked spend his spare moments at his home on the Ke coast among the country folk and fishermen he k so well."

He was married in 1927 and Mrs. Loughnane surv him.

Births, Marriages, and Deaths

BIRTHS

ASQUITH.—On July 19, the wife of Dr. Raymond Asquith—
COLLIE.—On July 21, in London, the wife of Dr. Ian Collie—
FRYER.—On June 19, at Hillingdon, the wife of Dr. Graham —a son.
HEATHFIELD.—On July 22, at Chingford, Essex, the wife of K. W. G. Heathfield—a son.
KERR.—On July 17, at Dumfries, the wife of Dr. P. M. Kerr —a son.
LAING.—On July 22, at Limpsfield, Surrey, the wife of Dr. Laing—a son.
LLOYD.—On July 17, at Tenterden, the wife of Dr. T. W. —a daughter.
MANN.—On July 16, in London, the wife of Dr. —a son.
MAXWELL-MULLER.—On July 20, at Molesey, the wife of Dr. Maxwell-Muller—a daughter.
PORRITT.—On July 19, in London, the wife of Mr. A. E. F.R.C.S.—a daughter.
ROBINSON.—On July 18, at Sheffield, the wife of Mr. R. G. O.M., F.R.C.S.—a daughter.

MARRIAGES

CROSSKEY—CROUCH.—On July 17, at Warwick, Henry Crosskey, M.B., to Katherine Sheila Mildred Crouch,
MOSS—TOOKE.—On July 17, at Ealing, Hugh James Moss, to Jean Veronica Tooke.

DEATHS

FULLER.—On July 10, at Perranporth, Cornwall, Andrew Fuller, M.R.C.S., D.P.H., aged 55.
McGOWAN.—On July 24, at Oldham, James Sinclair M.D. B.SC., Lond., aged 81.
OWEN.—On July 21, Emrys Daniel Owen, M.B. B.SC., Wale
SCOTT.—On July 16, at Longside, Aberdeenshire, William Gordon Scott, L.R.C.P.E., aged 67.

:RHOSIS OF THE LIVER IN CEYLON AND ITS RELATION TO DIET

A REVIEW OF 102 CASES

P. B. FERNANDO
M.B. Lond., M.R.C.P., D.T.M. & H.

O. R. MEDONZA
L.M. & S. Ceylon

P. K. RAJASURIYA
L.M. & S. Ceylon

From the Department of Medicine, University of Ceylon

HE wide prevalence of cirrhosis of the liver in tropical tries has been noted by many workers. Its causation pathogenesis, however, have remained obscure. diseases have been suggested as of ætiological tance, such as amœbic dysentery (Rogers and w 1946), bacillary dysentery (Menon and Annamalai , and malaria (Hughes 1933), but these are so present without the supervention of cirrhosis that other factor too seems to be involved. Alcohol, h is an important ætiological agent in Europe and rica, is comparatively infrequent as a cause of liver osis in the tropics. The experimental production of al cirrhosis in animals by diet alone (Himsworth and n 1944) suggests that the common factor in many cal conditions favouring the development of cirrhosis be deficiencies of diet. Dietetic deficiencies are spread in certain tropical countries where cirrhosis mmon, and cirrhosis has been produced in animals tained on certain of these diets (Gillman 1944). her studies correlating the clinical types of cirrhosis the underlying diets are necessary before the ætio- al rôle of diet in the production of cirrhosis is blished. The clinical histories of 102 patients treated s for cirrhosis have been studied from this point of .

e following figures give an idea of the prevalence of osis in Ceylon :

The average annual death-rate from cirrhosis of the in Colombo, where the registration of death is by qualified cal men, for 1941–46 was 13·6 per 100,000 of the lation.

During the same period the average annual admissions irrhosis of the liver to the General Hospital, Colombo, 156 (0·4% of the total admissions). Of 1789 necropsies rmed during this period 3·07% were on cases of cirrhosis e liver.

ylon appears to occupy an intermediate position, gards the prevalence of cirrhosis, between European tries and certain tropical countries. The death-rate cirrhosis per 100,000 of the population was 32·6 in ras (average for the ten years 1923-32) whereas in land and Wales it was only 4·7 (average for nine years -28). The necropsy figures for India have varied with different parts of the country—4·4% in Madras, 9·3% izagapatam, and 6·9% in Calcutta. On the whole have been high compared with the figures in Europe g., 1% in Berlin (Menon and Annamalai 1935).

he age-distribution and sex-distribution of 102 ents admitted for cirrhosis of the liver under the care e of us (P. B. F.) to the General Hospital, Colombo, 941–47 were as follows :

Age (yr.)	*No. of cases* *Male*	*Female*
1–9	1	0
10–19	1	1
20–29	5	5
30–39	10	8
40–49	34	2
50–59	15	2
60–69	9	5
70–79	4	0
80 or more	0	0

The ratio of males to females was about the same in the total admissions to these wards, indicating that there is no greater susceptibility to the disease in either sex. However, females seem to get cirrhosis at a younger age.

The racial distribution was as follows :

Race	*No. of cases*	*Percentage of total admissions*
Sinhalese	86 (83·5%)	84·9
Tamils (Ceylon) ..	8 (7·7%)	2·9
Indian Tamils.. ..	5 (4·8%)	4·7
Muslims	4 (3·9%)	3·7
Burghers	0 (—)	3·6
Others	0 (—)	0·2

The incidence of cirrhosis in the different races seems to correspond to the general racial distribution in the total admissions except in the case of Ceylon Tamils. In view of the fact that they are mainly vegetarians, their disproportionate representation in the cirrhosis group is noteworthy.

Except in 9 patients in whom the diagnosis was made at necropsy or by biopsy the clinical picture in the remaining 93 patients was typical of portal cirrhosis and was characterised by ascites in 96·7% and hæmatemesis in 17·6%. The clinical histories of the great majority, however, fell into two clear categories. In one group there was a definite history of an illness characterised by jaundice and biliuria preceding the onset of the cirrhosis ; in the other the onset was insidious, there being no history of jaundice but only of vague ill health, weakness, loss of appetite, &c., followed by the gradual development of ascites and the other signs of portal cirrhosis. The appearances of the liver at necropsy or on biopsy were also distinct in the two groups. In the former group the liver was coarsely nodular and showed microscopically collections of hyperplastic liver cells lacking the normal structure of the liver lobules and separated by areas of scar tissue (figs. 1 and 3). In the latter group the liver was more finely granular and fibrous, showing microscopically a more uniform fibrosis affecting the portal region and breaking up the liver lobules, of normal structure, into fragments or groups (figs. 2 and 4). Both clinically and pathologically these two categories correspond to toxic cirrhosis and multilobular cirrhosis or Laennec's cirrhosis (Boyd 1940). There were 15 cases in the former group and 87 in the latter.

TOXIC CIRRHOSIS

Ascites was the most important presenting condition and was found in all 15 cases ; it had developed insidiously and had persisted for months in most cases. In 12 cases there was œdema of the legs, which had developed later than the ascites. The liver was enlarged in 4 cases and the spleen in 3. A severe attack of jaundice had preceded the development of ascites in 12 of the 15 cases. In 2 of these there had been an attack of jaundice associated with ascites, and after an intervening period of good health the ascites alone had recurred. In 1 there had been only jaundice at the original attack ; a year later ascites had set in. In 9 cases the jaundice had persisted up to the time of admission into the hospital, the average duration being 90 days (range 30–240 days). In all these 9 patients the ascites had developed insidiously in the course of the jaundice. In 1 case no history was available, the patient being dull and drowsy on admission. In 2 cases there was no jaundice at any time, and there was nothing to distinguish them from Laennec's cirrhosis. However, a biopsy in the case of one and necropsy in the other showed that the condition was toxic cirrhosis. Lawrence (1946) reported a case of subacute necrosis of the liver without icterus and referred to 12 other cases. These 2 cases are interesting in providing further evidence that toxic cirrhosis may not infrequently occur without a previous history of jaundice. Apparently in such cases a series of attacks of " acute

Tuberculosis Association

At the annual meeting it was decided that this organisation's name should be changed to the British Tuberculosis Association.

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Aug. 3, at 4.30 P.M., in the anatomy lecture theatre of Edinburgh University, Prof. D. F. Cappell will lecture on the Present Position of the Rhesus Factor.

Visitors' Entitlement to N.H.S. Benefits

The Ministry of Health announces (E.C.L. 60) that visitors to Great Britain, and visiting seamen, will be able to apply for treatment under the National Health Service.

Medical Historians Committee

A meeting of the United Kingdom, Dominions, and United States Official Medical Historians Liaison Committee will be held in Oxford from Aug. 3 to 7. The objects of this committee, which is sponsored by the governments concerned, is to provide opportunities for medical historians to consult together on technical questions. The committee's first meeting was held in Ottawa last September.

Advisers in Postgraduate Education

The governing body of the British Postgraduate Medical Federation on behalf of the University of London have made the following appointments of regional adviser in postgraduate medical education for the London metropolitan hospital regions: Mr. D. F. Ellison Nash (North-East); Dr. H. G. McGregor (South-East); Mr. P. H. Mitchiner (South-West). No appointment has yet been made for the North-West metropolitan region.

International Hospital Federation

Captain J. E. Stone, consultant on hospital administration and finance to King Edward's Hospital Fund for London, has been appointed hon. secretary and treasurer of this federation. The federation's secretariat will be established temporarily in the offices of the Fund, 10, Old Jewry, London, E.C.2.

The federation is an international organisation for the collection of national literature on hospital work and practice; the holding of international hospital congresses; the setting up of international study commissions; and the publication of reports, with a view to the improvement of hospital development, planning, equipment, technique, and administrative practice. The first international hospital congress will be held in Holland next June.

Compensation for Goodwill of Practices

Doctors who retired from practice or the personal representatives of doctors who died between the date of the passing of the National Health Service Act—Nov. 6, 1946 and July 5, 1948, and whose practices have not been sold in whole or part by July 5, 1948, should make early application to: the secretary of the Medical Practices Committee (Devonshire House, Mayfair Place, London, W.1), for a certificate that the conditions laid down in section 37 of the Act are satisfied. If the conditions are satisfied a claim for compensation for the loss of the right to sell the goodwill of the practice may be made on a form which the committee will supply. The completed claim form must be sent to the Ministry of Health by Oct. 31, 1948. Doctors on medical lists on July 5, 1948, will receive a claim form from the executive council for their area. Any doctor who does not shortly receive this form should apply to his executive council.

Superannuation of Mental Health Officers

The special rights of mental health officers under the National Health Service (Superannuation) Regulations, 1947, are supplemented under the National Health Service (Superannuation) (Amendment) Regulations, 1948. A leaflet (S.D.E.) explains that under the amending regulations a mental health officer who completes, or has completed, altogether 20 years' service in the new service and on equivalent duties before transfer will be able to qualify for retirement benefits at 55, and to count as double its length all service in the National Health Service scheme which is (*a*) after age 50 if the 20 years have been completed *by* that age, or (*b*) after the completion of the 20 years if this is *after* age 50. This provision will be of special advantage to officers transferred from mental-deficiency institutions or voluntary mental hospitals. Those who were under the Asylum Officers' Superannuation Act, 1909, or other statutory superannuation scheme have the option, on transfer to the N.H.S. scheme, to remain under the same conditions. This is explained in leaflet S.D.A.; and similar arrangements apply to nurses in voluntary hospitals (leaflet S.D.B.)

Ministry of Labour and National Service

Prof. I. G. Davies, Dr. T. G. Faulkner Hudson, J. A. L. Vaughan Jones have been appointed medical to the Ministry on the employment of the disabled.

Central Council for Health Education

The council are to issue to each of the local authorities in England, Wales, and Northern Ir exhibit dealing with a health topic; and from time this will be replaced by new material. This was by Mr. Henry Lesser, the retiring chairman, at the annual meeting in London on July 22. Mr. Le reported that the council are to provide free two-day in health education every two or three months at six universities. Mr. Lesser was succeeded as chairman E. K. Macdonald, medical officer of health for Leicester Dr. W. A. Bullough was elected vice-chairman.

World Health Organisation

Dr. G. Brock Chisholm, C.B.E., has been appointed director-general of W.H.O.

Dr. Chisholm, who is 52, served as a combatant in the war, winning the Military Cross and bar. He qualified in at Toronto in 1924 and was in general practice for several He then studied psychological medicine at the Maudsley and returned to Canada to work in Toronto as a psychiatrist the outbreak of the late war he resumed combatant command of the Lorne Scots, and successively of an infantry and of a military district. Later he became director of per selection and deputy adjutant-general of the Canadian Forces took a large share in devising and developing the personnel since adopted with modifications by the British and Ame armies. Having never previously been an army doctor, he appointed director-general of the medical services of the Canad army in the latter part of the war, with the rank of major-gen Thereafter he was deputy minister of national health and we for Canada before being appointed, two years ago, ex secretary of the W.H.O. interim commission.

CORRIGENDUM: *the late Captain Watson.*—The which reference was made in last week's memoir was *Teviotbank.*

Appointments

ASHTON, N. H., M.R.C.S.: pathologist, Institute of Ophth London.

CLARKE, P. J. H., M.B., B.SC., N.U.I., D.P.H.: M.O.H., S

DOUGLAS, D. M., M.B. Lond., M.R.C.P., D.C.H.: asst. Royal Edinburgh Hospital for Sick Children.

FAIRMAN, H. D., M.B. Lond., D.L.O.: surgeon, ear, nose, department, Bristol Royal Hospital.

GREIG, ALEXANDER, M.B. St. And., D.M.R., D.M.R.T.: therapist, General Infirmary, Leeds.

HARKNESS, JOHN, M.B., B.SC. Glasg.: biochemist, Portsm Isle of Wight area pathological service.

HUNTER, R. M. M., M.B. B.SC. Edin., D.P.H., D.P.M.: deputy superintendent, Herrison Mental Hospital, Dorset.

* JOLLY, H. R., M.A., M.B. Camb., M.R.C.P.: house-ph Hospital for Sick Children, Great Ormond Street, Lond

QUINTON, J. P. P., B.A., M.B. Camb., M.R.C.P., D.C.H.: pædiatric Norfolk and Norwich Hospital, and Jenny Lind Hosp Children.

WALKER, V. R., M.B., B.SC. Glasg., D.P.H.: divisional M.O. Herts, and M.O.H., Letchworth, Baldock, Hitchin, S and Royston.

Middlesex Hospital, London:

HEWER, A. J. H., M.B. Lond., D.A.: anæsthetist.

HOBSON, J. A., M.D., B.SC. Manc., M.R.C.P., D.P.M.: asst. ph department of psychological medicine.

JACKSON, I. M., B.A., M.B. Camb., F.R.C.S., M.R.C.O.G. obstetric and gynæcological surgeon.

South London Hospital for Women:

BOULTON, MARGARET, M.R.C.S.: senior gynæcological re

SPENCER, JOAN, M.R.C.S.: junior gynæcological registrar

Liverpool Regional Hospital Board:

KERR, J. M., M.D., D.P.H.: asst. senior M.O. (infectious

RUSHWORTH, J. A., M.R.C.S., D.P.H.: asst. senior M.O. (tub

Glasgow Royal Infirmary:

DEWAR, A. C., M.B. Glasg., D.P.H.: asst. physician, ment.

PATON, J. P. J., M.D. Glasg.: physician to outpatient dep

RAMAGE, J. H., M.B. Glasg., F.R.F.P.S.: asst. physician patient department.

London County Council:

Assistant M.O., public-health department:

CANN, A. M. R., M.D. Lond., D.C.H.

DUNKLEY, JOAN, M.R.C.S.

MEADE, CAROLINE, M.B. Lond., D.P.H.

RAY, W. T. D., M.R.C.S.

SUTCLIFFE, MARGARET, B.A., M.B. Dubl.

* Amended notice

se 4.—A woman, aged 44, was in good health till she oped anorexia and vague ill health some months before sion. For four months her food had consisted mostly or 4 cups of rice conjee a day, and plain tea with sugar. or twice a week she would take rice with a little tomato and sambol, but often she vomited after this. She had ilk only about a dozen times during this whole period of nonths. At the end of this period she developed jaundice fter some weeks ascites.

se 5.—A woman, aged 27, developed anorexia in the month of pregnancy. For three months her food ted of a few pieces of bread with sambol and fish gravy on (she did not eat any fish), and a cup of malted milk e morning and night Three weeks after labour she oped jaundice.

se 6.—A man, aged 60, as a result of a domestic quarrel up taking any food at home for about three months. g this period his food, which he ate at tea kiosks, ted of plain tea with sugar and bread. He had no ıbles, milk, meat, or fish during the whole of this period. e end of it he developed ascites, for which he entered a hospital, and was cured after several weeks. He now ed his normal food and domestic relations and was in health for several months, when ascites recurred. In of treatment it persisted, and after six months he entered al on the present occasion. Biopsy of the liver at r's operation showed the toxic type of cirrhosis (fig. 5).

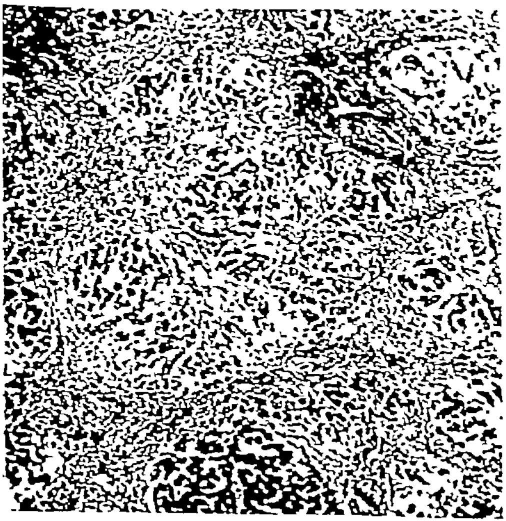
these 6 patients the diet was most deficient in its n content. Cases 4 and 6 are also of interest owing fact that condiments were absent altogether or nuch reduced for long periods preceding the onset illness. In the past when the emphasis was on positive cirrhotic agent in the diet, condiments often incriminated.

LAENNEC'S CIRRHOSIS

87 cases in this section fell into three groups ating the developmental stages of the cirrhotic s. Table I gives the main clinical findings in these groups.

I : Fatty Infiltration and Early Cirrhosis

e were 8 patients in this group : 3 females and 5 males. ver was greatly enlarged in all, the position of the border varying from three finger-breadths below stal margin to the level of the umbilicus. There was derness and no palpable nodularity on the surface. was no clinical condition such as amœbic hepatitis, stive cardiac failure, or tumour to explain the gement. In 4 cases, besides the enlargement, there scites, and the diagnosis of cirrhosis of the liver was not in doubt. In the remaining cases there was no ascites, but the enlargement was associated with the same evidence of liver dysfunction as in the cases with ascites. The Takata-Ara test was positive in all : the plasma-albumin level was reduced, in the 3 cases in which it was done, to an average of 2·25 g. per 100 ml. ; the hippuric-acid test showed an average of 30% of normal function in the 2 cases in which it was done ; and the van den Bergh reaction was indirect positive in 3.



-Section of liver shown in fig. 2: typical multilobular cirrhosis. (× 38.)

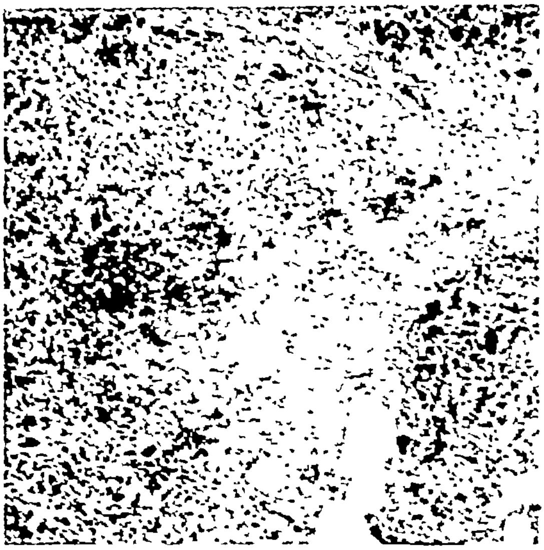


Fig. 5—Biopsy specimen of liver in case 6 : nodules of hyperplastic liver cells separated by wide areas of fibrous tissue containing numerous bile-ducts in some places. (× 85.)

The clinical diagnosis of fatty infiltration and early cirrhosis was confirmed by liver biopsy in the 3 cases in which it was done. Figs. 6, 7, 8, and 9 are photomicrographs of the histological sections from the liver in 2 of these cases.

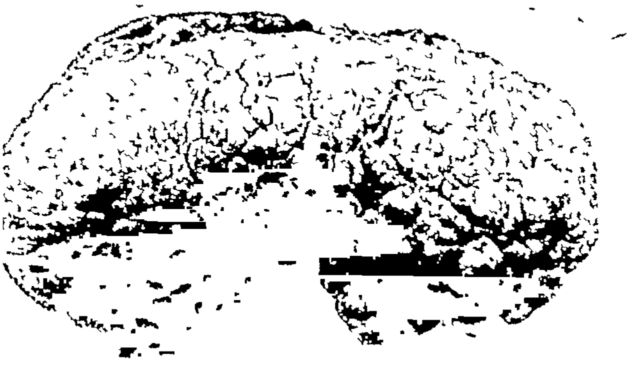
These patients were treated with a good diet consisting of meat, fish, milk, rice, bread, vegetables, fruits, &c. In addition glucose, mercurial diuretics, and dehydrocholin were given by injection to those with ascites. The average stay in hospital was about a month ; 4 patients left without much improvement ; 2 were discharged very much improved and free of ascites ; 1 patient developed pneumococcal meningitis and died (she developed clinical jaundice during the illness) ; 1 died after laparotomy. Of the 2 patients who were discharged relieved, 1 was readmitted after about six weeks for hæmatemesis of which he died. At necropsy Laennec's cirrhosis was found, with considerable fatty infiltration of the liver cells.

Group II : More Advanced Stage

There were 19 patients in this group : 5 females and 14 males. The liver was palpable on the average about two finger-breadths below the costal margin, and the edge was firm and elastic. Eighteen patients had ascites, and 3 hæmatemesis also. The spleen was enlarged in 7, and there was œdema of the legs in 7 ; the œdema had developed subsequent to the ascites. One patient had neither ascites nor hæmatemesis but was admitted in a cachectic state, with a hard and palpable liver ; he died eleven days later, and necropsy showed Laennec's cirrhosis.

The treatment in this group was the same as in the previous cases ; in addition paracentesis abdominis was done whenever abdominal distension indicated it ; 5 patients improved on treatment and were discharged free of ascites ; 10 patients left unrelieved ; and 3 died

already referred to.



. 1—Toxic cirrhosis of liver in a man aged 52 : liver coarsely nodular, with some nodules more than 2 cm. in diameter.

llow atrophy in miniature " occur without obvious undice but leading eventually to cirrhotic changes. In ch cases the clinical differentiation from Laennec's rhosis will be very difficult.

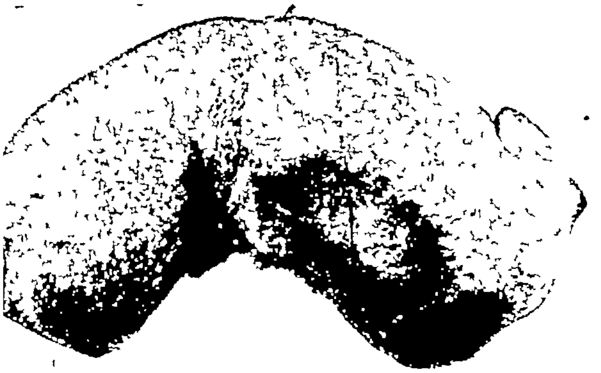
In the early stages of toxic cirrhosis the lowered ısma-albumin level seems to be an important factor the production of ascites, for in 2 cases the ascites sappeared with improvement in the plasma-albumin vel. In the later stages portal obstruction appears to the main factor concerned in the production of ascites.

6 cases repeated paracentesis and removal of large antities of fluid were necessary to relieve the abdominal stress, and in 2 of these reaccumulation of fluid was evented only by surgical measures. In 3 of these cases which the plasma-protein levels were determined the umin was well above the critical level at which lema develops. In 2 patients there was repeated ematemesis in spite of normal bleeding-time and otting-time, providing further evidence of the high gree of portal obstruction present in these cases.

boratory Findings

The laboratory findings were in keeping with the nical findings and indicated liver dysfunction. In 8 the 14 cases examined the van den Bergh gave a phasic reaction on admission; in 4 it was indirect sitive, and in 2 negative. In all 14 cases in which the kata-Ara test was done it was positive. In 7 cases which the hippuric-acid test was done it was below % of the normal function in 4 cases, and in the others tween 25 and 50%. The plasma-proteins were determned in 8 cases. The average total plasma-proteins per 0 ml. were 6·3 g., the albumin was reduced to an erage of 2·33 g., and the globulin was increased to 71 g. The average fibrinogen content was 0·27 g.

Of the 15 patients 4 were discharged apparently cured d free of ascites, in 2 the improvement following omentopexy; 3 patients left without improvement; and 8 died in hospital. In 3 cases the diagnosis was confirmed by necropsy and in 3 by biopsy of the liver. The livers were contracted and fibrotic, with a coarsely nodular surface, some nodules being more than 2 cm. in diameter, and the histological findings were those described for toxic cirrhosis (Boyd 1940).



. 2—Laennec's cirrhosis of liver in a man aged 40 : liver finely granular and fibrous.

Dietetic History

Of the 15 patients, 2 were of a higher economic level than the general non-paying class of patients studied. One, a vegetarian, took a daily diet which included bread, rice, vegetables, ghee, butter, and milk. The other had meat and fish as well. Of the remainder, 6 patients were of the average non-paying class, and their diet consisted of rice, bread, and preparations made of flour and vegetables; once or twice a week they had meat or fresh fish and on the other days dry fish. Condiments consisting of chillies, pepper, mustard, &c., were used in the preparation of the vegetables and fish curries. Fats were obtained in the form of coconut and coconut oil. The amounts of eggs and milk in these diets were negligible. One patient was too ill to give a detail history of his diet, but his relations said that for sever months he took only one meal a day, consisting of abo six string hoppers, a preparation made of baked flo and each weighing about an ounce, and sambol, whic consists of ground chillies, onions, maldive fish, and lim juice or vinegar, in small quantities. For the other mea he had tea with sugar but no milk.

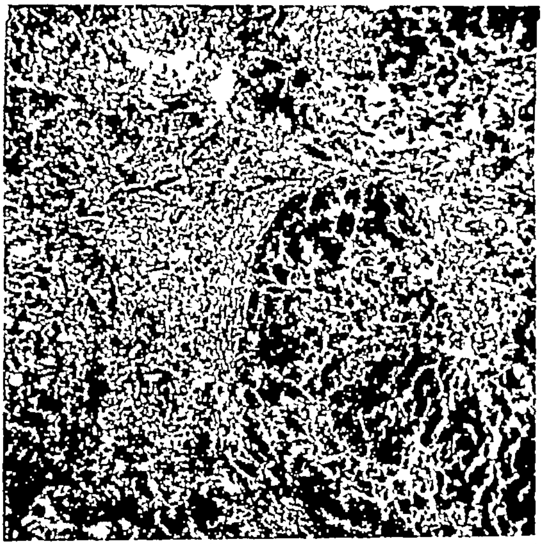


Fig. 3—Section of liver shown in fig. 1 : nodules of hyperplastic liv cells, with loss of normal lobular structure ; strands of fibrous tiss separating nodules contain numerous bile-ducts. (× 70.)

In 6 patients there was a definite history of dieteti deficiency preceding the illness :

Case 1.—A young man, owing to war-time food restri tions, used to eat only yams or preparations made of flou for about five days in the week. These were eaten plain o with a little coconut. On about two days in the week he too rice, and with this he had one or two vegetables. He too fish or meat only about twice a month but never milk or egg

Case 2.—A man, aged 45, had developed an illness charac terised by anorexia and recurrent attacks of fever, as a resul of which his diet had been very restricted, consisting on mos occasions only of rice conjee (water in which rice has bee boiled) After about seven months of this he develope jaundice and later ascites. He recovered with treatment but after some months of good health the ascites reappeared for which he now entered hospital.

Case 3.—A woman, aged 28, usually ate rice or bread and two vegetables. Meat or fish was taken only about once a month; milk never.

Case 4.—A woman, aged 44, was in good health till she eveloped anorexia and vague ill health some months before dmission. For four months her food had consisted mostly f 3 or 4 cups of rice conjee a day, and plain tea with sugar. Once or twice a week she would take rice with a little tomato urry and sambol, but often she vomited after this. She had ad milk only about a dozen times during this whole period of our months. At the end of this period she developed jaundice nd after some weeks ascites.

Case 5.—A woman, aged 27, developed anorexia in the ixth month of pregnancy. For three months her food onsisted of a few pieces of bread with sambol and fish gravy at noon (she did not eat any fish), and a cup of malted milk n the morning and night. Three weeks after labour she developed jaundice.

Case 6.—A man, aged 60, as a result of a domestic quarrel gave up taking any food at home for about three months. During this period his food, which he ate at tea kiosks, consisted of plain tea with sugar and bread. He had no vegetables, milk, meat, or fish during the whole of this period. At the end of it he developed ascites, for which he entered a local hospital, and was cured after several weeks. He now resumed his normal food and domestic relations and was in good health for several months, when ascites recurred. In spite of treatment it persisted, and after six months he entered hospital on the present occasion. Biopsy of the liver at Frazer's operation showed the toxic type of cirrhosis (fig. 5).

In these 6 patients the diet was most deficient in its protein content. Cases 4 and 6 are also of interest owing to the fact that condiments were absent altogether or very much reduced for long periods preceding the onset of the illness. In the past when the emphasis was on some positive cirrhotic agent in the diet, condiments were often incriminated.

LAENNEC'S CIRRHOSIS

The 87 cases in this section fell into three groups illustrating the developmental stages of the cirrhotic process. Table I gives the main clinical findings in these three groups.

Group I: Fatty Infiltration and Early Cirrhosis

There were 8 patients in this group: 3 females and 5 males. The liver was greatly enlarged in all, the position of the lower border varying from three finger-breadths below the costal margin to the level of the umbilicus. There was no tenderness and no palpable nodularity on the surface. There was no clinical condition such as amœbic hepatitis, congestive cardiac failure, or tumour to explain the enlargement. In 4 cases, besides the enlargement, there was ascites, and the diagnosis of cirrhosis of the liver was not in doubt. In the remaining cases there was no ascites, but the enlargement was associated with the same evidence of liver dysfunction as in the cases with ascites. The Takata-Ara test was positive in all; the plasma-albumin level was reduced, in the 3 cases in which it was done, to an average of 2·25 g. per 100 ml.; the hippuric-acid test showed an average of 30% of normal function in the 2 cases in which it was done; and the van den Bergh reaction was indirect positive in 3.

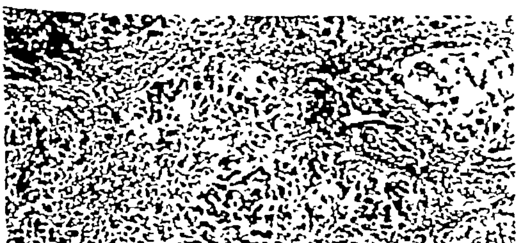


Fig. 4—Section of liver shown in fig. 2: typical multilobular cirrhosis. (× 38.)

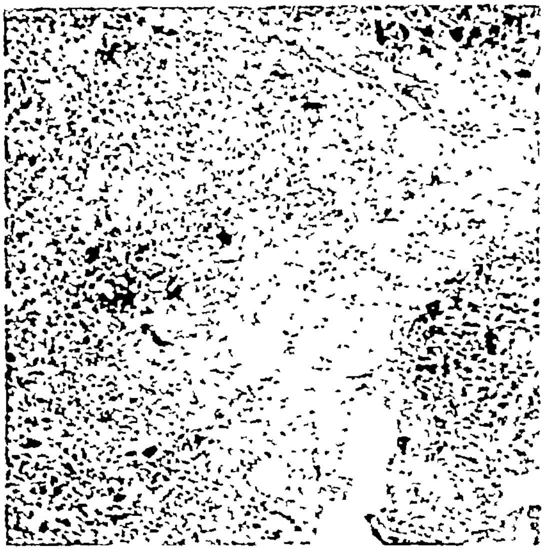


Fig. 5—Biopsy specimen of liver in case 6: nodules of hyperplastic liver cells separated by wide areas of fibrous tissue containing numerous bile-ducts in some places. (× 85.)

The clinical diagnosis of fatty infiltration and early cirrhosis was confirmed by liver biopsy in the 3 cases in which it was done. Figs. 6, 7, 8, and 9 are photomicrographs of the histological sections from the liver in 2 of these cases.

These patients were treated with a good diet consisting of meat, fish, milk, rice, bread, vegetables, fruits, &c. In addition glucose, mercurial diuretics, and dehydrocholin were given by injection to those with ascites. The average stay in hospital was about a month; 4 patients left without much improvement; 2 were discharged very much improved and free of ascites; 1 patient developed pneumococcal meningitis and died (she developed clinical jaundice during the illness); 1 died after laparotomy. Of the 2 patients who were discharged relieved, 1 was readmitted after about six weeks for hæmatemesis of which he died. At necropsy Laennec's cirrhosis was found, with considerable fatty infiltration of the liver cells.

Group II: More Advanced Stage

There were 19 patients in this group: 5 females and 14 males. The liver was palpable on the average about two finger-breadths below the costal margin, and the edge was firm and elastic. Eighteen patients had ascites, and 3 hæmatemesis also. The spleen was enlarged in 7, and there was œdema of the legs in 7; the œdema had developed subsequent to the ascites. One patient had neither ascites nor hæmatemesis but was admitted in a cachectic state, with a hard and palpable liver; he died eleven days later, and necropsy showed Laennec's cirrhosis.

The treatment in this group was the same as in the previous cases; in addition paracentesis abdominis was done whenever abdominal distension indicated it; 5 patients improved on treatment and were discharged free of ascites; 10 patients left unrelieved; and 3 died of liver failure besides the 1 already referred to.

Group III : Atrophic Stage

There were 60 patients in this group : 10 females and 50 males. The liver was contracted and impalpable. 53 patients had ascites, and 9 of these had hæmatemesis also. Three had hæmatemesis but no ascites. Four patients who had neither ascites nor hæmatemesis were admitted in a cholæmic state, and cirrhosis of the liver was diagnosed at necropsy.

The treatment was the same as in the previous groups. In 21 patients paracentesis abdominis had to be done, and in 3 surgical treatment was given to relieve the obstruction. Eight patients were discharged relieved of the ascites ; 33 left in much the same condition as they came in ; and 15 patients died besides the 4 already mentioned. The cause of death was cholæmia in 11, hæmatemesis in 4, heart-failure and anæmia in 1, and tuberculosis in 1. One patient collapsed and died after paracentesis abdominis, and 1 died of liver failure after operation. The diagnosis of cirrhosis was confirmed in all 8 cases in which necropsy was allowed.

Laboratory Tests

It was impossible to carry out all the laboratory tests mentioned in every case. Besides 6 patients who showed clinical jaundice as a terminal event, an indirect van den Bergh reaction was present in 35 of 70 patients examined (50%) ; in 31 cases (44%) it was negative. Bile-pigment was absent from the urine in 66 of 70 patients examined (94%). Clinical jaundice with excretion of bile-pigments, as against a slight icterus, was not foun in this group of cases.

TABLE I—CLINICAL FINDINGS IN LAENNEC'S CIRRHOSIS

Clinical findings	Group I		Group II		Group III	
	No. examined	Findings	No examined	Findings	No. examined	Findings
Duration of illness before admission ..	7	*5·7 mths.*	13	*8·2 mths.*	45	*5·6 mths.*
Ascites	8	4	19	18	60	53
Hæmatemesis.. ..	„	1	„	3	„	12
Other hæmorrhages ..	„	0	„	2	„	3
Œdema of legs ..	„	2	„	7	„	31
Fever on admission ..	„	2	„	5	„	5
Jaundice	„	1	„	2	„	3
Cholæmia	„	0	„	4	„	12
Splenomegaly.. ..	„	4	„	7	„	11
Alcoholism	„	1	„	9	„	17
Malaria	„	2	„	5	„	11
Hypovitaminosis :						
Night-blindness ..	„	1	„	0	„	3
Bitot's spots ..	„	0	„	0	„	2
Glossitis	„	1	„	0	„	0
Syphilis (Wassermann reaction positive) ..	5	0	5	1	14	5
Dysentery :						
History	8	0	10	0	60	2
Fæces examined ..	4	0	6	0	21	1
Tuberculosis	8	0	19	0	60	3
Ankylostomiasis ..	„	4	„	3	„	8
Diet history : ..	6		11		26	
A		0		2		14
B		0		2		2
C		0		5		5
D		6		2		5
Average stay in hospital	8	*28 days*	19	*27 days*	60	*29 days*
Discharged improved	„	1	„	5	„	8
Discharged unimproved	„	4	„	10	„	33
Deaths	„	3	„	4	„	19

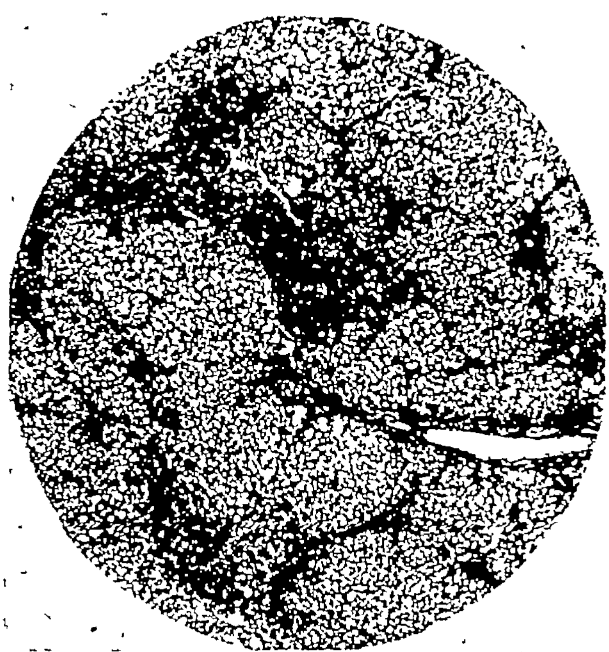


Fig. 6—Biopsy specimen of liver : extensive fatty infiltration and port fibrosis. Patient was a woman, aged 22, whose diet had been deficie in proteins and fats. No history of alcohol. (× 22.)

There was increased urobilinuria (more than 1/1 dilution) in 25 of the 64 patients examined. The Takata Ara test was positive in 63 of 68 patients examine (93%). Quick's hippuric-acid test showed that the live function was not more than 50% of normal in 85% o 41 patients examined. The plasma-proteins showed th changes characteristic of liver dysfunction. The serum albumin level was less than 4 g. per 100 ml. in 85% o 33 cases examined ; in 36% of cases it was even below 2 g. per 100 ml. On the other hand, the globulin was increased above 2 g. per 100 ml. in 79%.

Only 4 of the 53 patients examined had a hæmoglobin percentage above 75 (Dare's). The rest of the patients were anæmic, the average hæmoglobin percentage being 63. The anæmia was of the macrocytic hyperchromic type in 4 (7·5%) and macrocytic hypochromic type in 13 (24·5%). In 18 (34%) it was normocytic hypochromic. In 8 (15%) there was, in addition to a microcytic hypochromic anæmia, spherocytosis also. Thus the hæmatopoietic factor was deficient in nearly a third of the cases, and iron and the other materials necessary for hæmoglobin formation were lacking in about three-quarters. A normocytic normochromic anæmia was found in 6 cases (11%) and was apparently due to a hypoplastic condition of the marrow. The white cells were within the normal range in 28 of the 60 cases examined (47%); in 17 (28%) there was leucopenia ; and in 15 (25%) leucocytosis. The leucocytosis when present was polymorph in type. The platelets were reduced below 50,000 per c.mm. only in 1 case, but in 10 (20%) it was between 50,000 and 100,000 per c.mm. The clotting-time of blood was increased in only 1 of 48 cases examined

Ætiological Factors

Malaria and dysentery have been considered of importance in the ætiology of cirrhosis in the tropics. A history of malaria was available in 18 of the 87 patients (20·7%) in this group. Only 2 patients (1·3%) could remember having had dysentery. Of 31 patients whose stools were examined microscopically for dysentery only 1 was positive for *Entamœba histolytica*. As a control, 400 patients admitted to the medical wards of the hospital for various illnesses other than cirrhosis were questioned for a history of malaria and dysentery; 15·5% gave a history of malaria within a period of five years, and 6·5% of dysentery. The incidence of dysentery in the patients with cirrhosis is by no means greater than in the other patients, but the incidence of malaria was about 25% higher in the patients with cirrhosis.

Alcohol has long been recognised as of ætiological importance in cirrhosis. A history of alcohol was available in 19 (44%) of the 43 patients in whom a detailed dietetic history was available. Of these, 7 took alcohol only occasionally, and 12 (28%) took it daily. Of the 400 controls 28·5% were in the habit of taking alcohol, but 19% took it only occasionally; hence only 9·5% were regular alcoholics. The incidence of alcoholism among the cirrhotics is about three times that in the other patients.

Recent work has suggested that diet may be an important ætiological factor in the pathogenesis of cirrhosis. A detailed dietetic history was available in 43 cases. The diets fell into four main categories designated in the tables as A, B, C, and D.

Diet A is one in which, besides the staple food (rice or preparations made of flour), vegetables and some animal protein, such as dry fish, fresh fish, or meat, were consumed daily. Generally two good meals were taken at noon and night, and a light meal in the morning.

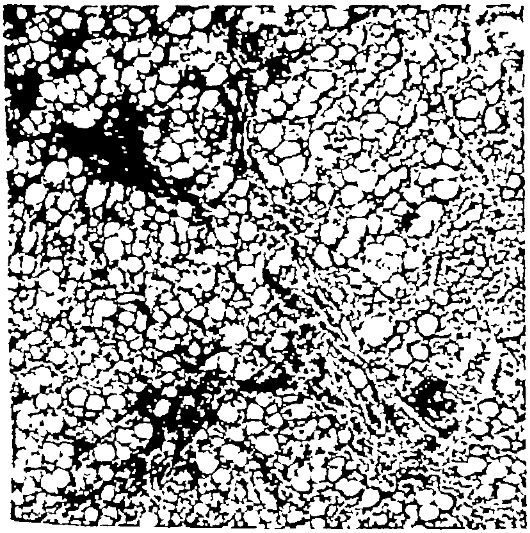


Fig. 7—Same as fig. 6. (× 90.)

Diet B consists of rice or preparations made of flour and vegetables taken daily with meat or fish about twice a week. The number of meals was three, as in A.

Diet C is similar to B except that no animal proteins are taken.

Diet D is a very deficient one; it normally consisted of rice or preparations of flour or some yams with about one vegetable; meat or fish was taken very infrequently, such as once or twice a month or not at all. Moreover, the quantities taken at a meal were insufficient, and the meals were not taken regularly, sometimes only one meal a day being taken.

The amount of eggs and milk consumed in any one of these diets is negligible. Condiments consisting of chillies, pepper, mustard, &c., are used as flavouring agents in the preparation of curries and are more likely to be present in greater quantity in the better-class diets which contain several curries than in the others. A sambol consisting of ground chillies, onions, maldive fish, and lime-juice or vinegar is usually taken in small quantities as an appetiser along with the rice and curries and may be considered as common to all categories of diets. Fats are usually obtained in the form of coconut and coconut oil.

It was impossible to determine from the history the actual quantities of the different foods consumed in these diets; however, Nicholls (1936) has measured the average daily amounts of proteins, fats, and carbohydrates per "man value" consumed by the poorer classes of the community in Ceylon, who live mainly on rice, dry fish, coconut, coconut oil, and vegetables. He found they consisted of 55·5 g. of protein, 32 g. of fat, and 365 g. of carbohydrates. This was the content of a diet that included fish daily. Diets B and C would correspond to this as regards carbohydrates and fats but inferior to it in proteins. Diet A would be better in the protein content but similar in fats and carbohydrates. Diet D would be inferior in all respects.

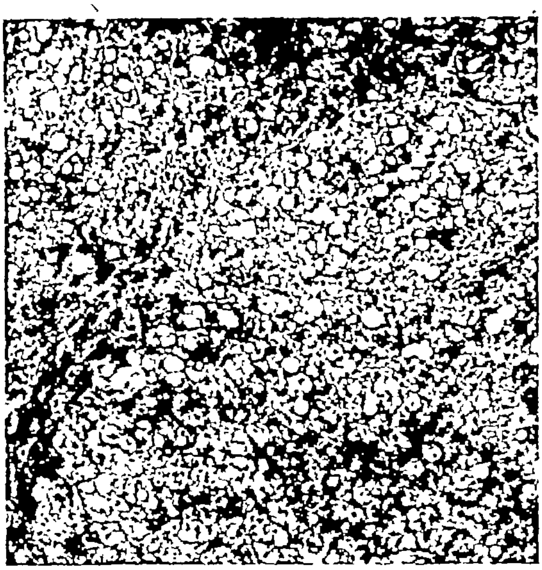


Fig. 9—Same as fig. 8. (× 70.)

Table II gives the distribution of the diets among the cirrhosis patients and among the 400 non-cirrhotic controls. It shows that the percentage of patients in the poorer categories of diets (C and D) among the cirrhosis patients is about four times that in the controls. Similarly, whereas 64·5% take a good diet (A) among the

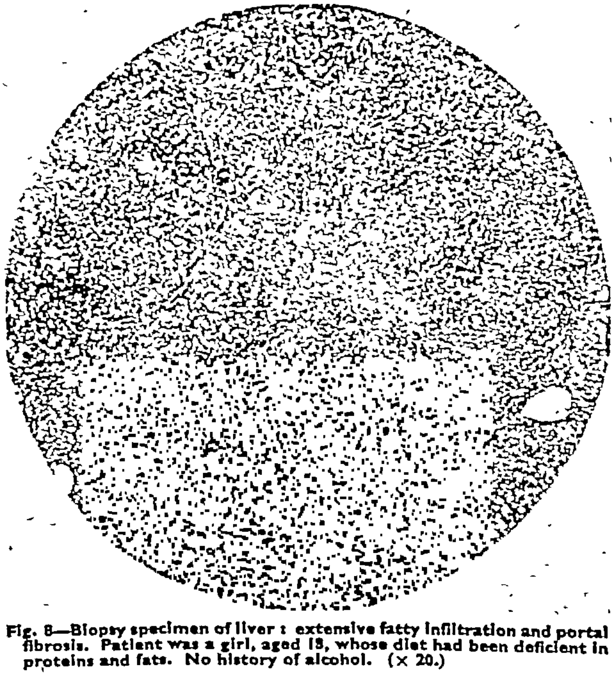


Fig. 8—Biopsy specimen of liver: extensive fatty infiltration and portal fibrosis. Patient was a girl, aged 15, whose diet had been deficient in proteins and fats. No history of alcohol. (× 20.)

controls, only about half that number do so among the cirrhotics.

The dietetic history of the patients in the group of "fatty infiltration" and early cirrhosis is particularly noteworthy, since in many of these cases the diagnosis has been confirmed by histological examination of the liver. In this group the dietetic history was available in 6. All belonged to category D.

One was also an alcoholic, who consumed about $1^{1}/_{2}$ bottles of arrack daily and, owing to loss of appetite, had neglected his meals for over one and a half years, though he was economically in a position to take a good diet.

Three were so poor that they could not afford to take regular meals, their food normally consisting of yams and coconut or rice and one vegetable; they were able to afford dry fish only very occasionally, once or twice a month. Nor were they able to afford even two good meals a day.

One patient was a postmaster in an inaccessible and isolated station for over two years. His regular meals consisted of rice with one vegetable or bread with plantains; meat, fish, eggs, or milk were not available for months. At the end of the period he developed ascites; in hospital he made good recovery on a good diet.

The remaining case was in a young woman who had developed anorexia. Vegetables, meat, fish, and milk made her sick, and for over a year her food consisted only of bread with sambol and plain tea with sugar. She was admitted to hospital because of progressive enlargement of the liver. None of these 5 patients took alcohol.

TABLE II—DIET AND CIRRHOSIS

Diet	Cirrhosis		Other diseases
	Including alcoholics	Excluding alcoholics	No. of cases
	No. of cases	No. of cases	
A	16 (37·2 %)	10 (32·2 %)	258 (64·5 %)
B	4 (9·3 %)	4 (12·9 %)	88 (22·0 %)
C	10 (23·2 %)	9 (29·0 %)	21 (5·25 %)
D	13 (30·2 %)	8 (25·8 %)	33 (8·25 %)
Total	43	31	400

DISCUSSION

The facts recorded here suggest that a history of an illness characterised by jaundice preceding the onset of cirrhosis is valuable evidence for differentiating toxic cirrhosis from Laennec's cirrhosis. The clinical picture in advanced stages of the two conditions may be identical, and some means of differentiating between them is desirable, since their pathogenesis, and therefore the prevention and treatment, are so different.

Toxic cirrhosis follows necrotising lesions of the liver, as the alternative names, postnecrotic cirrhosis and postnecrotic fibrosis, indicate. These necrotising lesions according to their severity are called acute or subacute yellow atrophy of the liver. Acute yellow atrophy has followed the administration of certain chemical compounds, such as 'Atophan,' for therapeutic purposes, and it has occurred in those exposed to certain industrial chemicals, such as trinitrotoluene and *tetrachlorethane*; idiopathic cases are met with most commonly in association with pregnancy, infective hepatitis, and homologous serum jaundice. The cause of the massive necrosis of the liver in these cases has been an enigma. Only a small proportion of those exposed to the chemical compounds or infections referred to develop it, and the pathological findings in the liver differ fundamentally from the diffuse zonal necrosis found in these infections (Mallory 1947). Himsworth and Glynn (1944), who noted the similarity of the massive necrosis of the liver in animals produced by a protein-deficient diet to that in human yellow atrophy, have suggested that the cause of massive necrosis is deficiency of the protective amino-acids in the blood reaching the liver. In infective hepatitis this deficiency may be due to faulty composition of the diet, or deficient intake of food, or the swelling of the liver inside the comparatively tough capsule may interfere with the blood-flow to certain regions. They have quoted impressive evidence in support of this view.

The question is whether massive necrosis may occur clinically apart from infective hepatitis, chemical poisons, &c., and owing to deficient diet alone. The occurrence of it in association with pregnancy uncomplicated by infective hepatitis favours such a possibility. In our 15 cases of toxic cirrhosis the clinical history in 8 suggested that the illness had started as an infective hepatitis, and that subacute yellow atrophy had set in as a complication. The diet in these cases was not deficient; and, if the pathogenesis of the liver necrosis is as described above, the protein deficiency must have been conditioned by the anorexia and vomiting and by swelling in the liver. In 6 patients definitely, and possibly in a seventh, a diet very deficient in proteins had been taken for a long time before the onset of the cirrhosis. In 4 of these a severe illness characterised by jaundice had set in after this period of dietetic deficiency, and this was later succeeded by the clinical picture of cirrhosis. In 2 a history of jaundice was absent altogether, though the pathological findings were those of toxic cirrhosis. In these 6 cases at least it looked as if the experiments of Himsworth and Glynn (1944) had been reproduced unwittingly.

The pathogenesis of the multilobular, or Laennec's, cirrhosis is different. Experimentally it has been produced by two different procedures. In one a hepatotoxic substance which produces a diffuse zonal type of necrosis of the liver has been administered at short intervals for a long time (Cameron and Karunaratne 1936); in the other either a high-fat diet or one deficient in lipotropic factors has been administered for a long time. This produces fatty infiltration of the liver, and prolonged fatty infiltration is followed by cirrhosis (Himsworth and Glynn 1944). The essential mechanism involved seems to be the constant absorption of the autolytic products of dead liver cells into the portal canals, where they stimulate the fibrous tissue to proliferate.

The conditions under which Laennec's cirrhosis develops in man are probably the same. An isolated injury, or one that operates at long intervals, is not likely to produce the repeated destruction of the liver parenchyma for long periods that is necessary. For this reason infective hepatitis, in which second attacks are uncommon and in which recovery usually occurs, with the development of considerable immunity (Havens 1947), is not likely to be a cause of Laennec's cirrhosis though it is the most important precursor of toxic cirrhosis. Malaria and dysentery, being self-limited diseases, are also unlikely to be of ætiological importance. Where people have been constantly exposed to toxic chemicals, as in certain occupations, cirrhosis has resulted (Butsch 1932, Poindexter and Greene 1934), though such cases are rare. Alcohol, which experimentally produces fatty infiltration of the liver (Rolleston and McNee 1929), has long been observed clinically to be an important ætiological agent of human cirrhosis. In Africa a high incidence of cirrhosis has been observed in those surviving the condition of malignant malnutrition, sometimes called kwashiorkor, in which severe fatty infiltration of the liver is a prominent feature (Gillman and Gillman 1945, Trowell and Muwazi 1945). The question is whether the cirrhosis which is so prevalent in the tropics, and in which neither alcohol nor severe malnutrition is a feature, may not be due to lipotropic deficiency in the diet.

A full dietetic history was available in only 43 patients of this group. There was no evidence that their diets contained more condiments than did those of the nonrhotic patients in the hospital. Nineteen patients con-sed to taking alcohol: of these 7 took alcohol only very casionally and 12 were regular alcoholics. In only ·9% therefore can alcohol be considered a cause of the rhosis. Eight patients had been subsisting for long riods on an all-round deficient diet, and 13 others had en on a diet whose protein and fat contents were below e requirements for health. The common factor in these patients (48·8%) was a diet deficient in proteins and ts, and the evolution of the pathological lesion in the er in these patients, as in the alcoholics, seemed to ve gone through an initial stage of fatty infiltration. the absence of a high-fat diet this fatty infiltration uld only have been due to lipotropic deficiency. The mmon dietary substances having high lipotropic tivity are, besides choline, animal proteins, such as r albumin, beef muscle, casein of milk, &c. Vegetable oteins are inferior in this respect (Hadfield and Garrod 47). Since the diets of these patients were very ficient in animal proteins, one may fairly conclude that 48·8% the cause of the cirrhosis was fatty infiltration the liver caused by lipotropic deficiency in the diet. the remaining 10 cases (23·3%) there was neither a story of alcoholism nor a deficient diet to explain the rhosis; nor had they ever had jaundice.

Whether the fatty infiltration of the liver observed in ronic alcoholism is due to a direct action of the alcohol the liver cells or to lipotropic deficiency induced by state of conditioned starvation has yet to be decided. he evidence in our series suggests that it may be due a direct action and not necessarily to concomitant tarvation. Of the 12 patients who were in the habit of aking alcohol daily and whose dietetic history was nown, 6 (50%) were in the dietetic category A and not nly took their meals regularly but also were in the habit f supplementing their regular meals with other food.

SUMMARY

The incidence of cirrhosis of the liver in Ceylon appears o be intermediate between its incidence in Europe and India.

A review is given of 102 cases of cirrhosis of the liver, ith special reference to the clinical types and their relaion to diet.

Of the 102 cases, 15 (14·7%) were toxic or postnecrotic irrhosis. In 8 of these 15 the cirrhosis had apparently ollowed infective hepatitis in persons on a good diet, hereas in 6 a long period of protein deficiency had receded the onset of the cirrhosis and appeared to have een concerned in the pathogenesis.

The remaining 87 cases (85·3%) were Laennec's irrhosis. Malaria, dysentery, and dietary condiments pparently played no part in the causation. In 48·8% f 43 patients in whom a detailed dietetic history was vailable the cause of the cirrhosis appeared to be fatty nfiltration of the liver due to lipotropic deficiency in the iet, whereas in 27·9% the cirrhosis was apparently due alcoholism. In 23·3% the cause of the cirrhosis was ot determined.

A history of an illness characterised by jaundice receding the onset of cirrhosis is considered valuable vidence for differentiating toxic cirrhosis from Laennec's irrhosis, in which the onset is insidious. The clinical icture in the late stages of the two conditions may be lentical.

We wish to thank Prof. W. A. E. Karunaratne and Dr. . H. Cooray, of the department of pathology, for their aluable help in studying the pathological material; Dr. . S. W. de Saram, Dr. G. R. Handy, and Dr. W. D. atnavale, pathologists of the General Hospital, for their oöperation; Prof. Milroy Paul, Dr. J. H. F. Jayasuriya, and r. A. S. Rajasingham, surgeons to the General Hospital, for btaining biopsy specimens of the liver, and Mr. G. Webster r the photomicrographs.

References at foot of next column

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ACUTE ATROPINE POISONING

REVIEW OF EIGHT CASES

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ACUTE atropine poisoning is not uncommon; it is fully discussed in the standard textbooks, and cases due to the ingestion of mixtures (Morton 1939, Comroe 1933, Alexander et al. 1946), the application of an ointment (Jones 1945), the accidental drinking of a liniment (Carter 1940), and the instillation of eye-drops (Duggan 1937, Hopkins and Robyns-Jones 1937) containing this alkaloid have been reported. No toxic reactions after the administration of atropine by subcutaneous injection have been reported in recent years.

Owing to an error in dispensing a stock solution, nine patients (cases 5–13 in the accompanying table) each received by subcutaneous injection atropine sulphate gr. $^1/_6$ instead of the gr. $^1/_{100}$ prescribed preoperatively. Four of these patients developed toxic signs and were observed by us. We have second-hand knowledge of four others (cases 1–4) who developed toxic signs. They probably received a similar amount of atropine, but the exact dose is not known. The main facts about the patients and the dates are shown in the table. All were young men with septic conditions requiring minor operations. Only one had a severe infection. The most severe cases were seen on Jan. 15, 1947, and it was not until after this that we suspected atropine poisoning. The whole incident was then investigated.

Case 8 received his atropine injection at 4 P.M. and was operated on at 5.15 P.M. At 6 P.M. he was excited, acutely confused, and hallucinated. His gait was ataxic. He was very talkative, though his speech was slurred, and he was disoriented both in time and in space. He asked to go to the toilet for a wash and brush-up, tried to put out an imaginary fire, addressed a girl friend by her nickname, looked inside people's coats, and so on. He seemed fatigued and allowed himself to be laid down, only to jump up again a few moments later. He even tried to kiss a male orderly. Though not aggressive he was very active and had to be forcibly restrained. He was flushed, and his pupils were dilated, but this was assumed to be due to his excitement. Nothing abnormal was noted about his pulse. He was thought to be in an acute confusional state precipitated by the anæsthetic and operation. Morphine gr. $^1/_4$ was given intravenously without effect. About half an hour later paraldehyde 6 ml. was given intramuscularly, and the patient was transferred to the psychiatric block, where he settled into a deep sleep. He awoke next morning to find himself considerably bruised. Remembering nothing of the previous night's

CASES OF ATROPINE POISONING

Case no.	Age (years)	Size of body	Complexion	Diagnosis	Atropine dosage (gr.)	Anæsthetic	Difficulty in Anæsthetising	Toxic signs
1	20	Large	Redhead	Paronychia	? 1/4	Soluble thiopentone and gas-and-oxygen	Normal resistance	Blurred vision, nightmares
2	23	Average	Dark	Abscess of arm	? 1/4	,,	Nil	,,
3	20	,,	,,	Abscess of buttock	? 1/4	,,	Slight difficulty	Delirium +
4	19	Small	,,	Paronychia	? 1/4	,,	No record	,,
5	19	Average	,,	Subcutaneous abscess of finger	1/4	Soluble thiopentone, gas-and-oxygen, and trilene	Nil	Nil
6	22	Large	,,	Paronychia	1/4	,,	,,	,,
7	21	Average	Fair	Abscess of ankle	1/4	,,	,,	,,
8	26	,,	,,	Paronychia	1/4	Gas-and-oxygen	Very difficult	Delirium + + +
9	22	Large	,,	,,	1/4	Soluble thiopentone and gas-and-oxygen	Difficult	Delirium + +
10	21	Small	,,	,,	1/4	,,	,,	Delirium +
11	21	Large	Very fair	Pulp-space infection	1/4	,,	,,	Delirium, blurred vision
12	33	Average	Dark	Large perineal abscess, very toxic	1/4	,,	Nil	Nil
13	22	Large	,,	Abscess of arm	1/4	,,	,,	,,

happenings, he was alarmed to find himself under restraint. The psychiatrist could find no evidence of mental illness, and the patient was transferred back to the septic surgical ward. At 10 A.M. he was extremely apologetic, and appeared normal apart from his septic finger. His pupils were not dilated, and his skin and pulse-rate were normal.

Three other patients who had been operated on at the same time as case 8 were found the same evening to be behaving strangely four or five hours after receiving atropine:

Case 9 was sitting up in bed plucking at his bandage and talking in a confused manner. He was picking imaginary objects off his chest and placing them carefully on the locker beside his bed. He settled down and slept after being given an injection of 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$.

Case 10 was sitting up in bed, sewing his sheet with an imaginary needle and thread. He talked about his sewing and, when it was suggested that he should go to sleep, remarked that he could never sleep in the daytime (although it was now dark).

Case 11 insisted on getting out of bed repeatedly and attempted to light numerous imaginary cigarettes.

All the patients were mentally normal next morning, and showed no dilation of the pupils. The least severely affected (case 11) was the only one who remembered anything of the night's excitement. He also had blurring of vision, which passed off during the morning.

Some days previously two other patients had shown similar behaviour, though neither was observed by us:

Case 3 had stripped his bed and gone round the ward searching for a tall pair of steps so that he could climb on to a high shelf.

Case 4 had asked for a nail-brush and gone to the bathroom, where he stayed for a long time scrubbing his nails.

A few days earlier two patients (cases 1 and 2) had complained of blurring of vision on the morning after operation, and both stated that they had been troubled by nightmares. The blurring had passed off after a few hours and had not come to our notice at the time.

Behaviour under Anæsthesia

In cases 1–4 and 9–13 anæsthesia was induced by a small intravenous injection of soluble thiopentone (average 0·35 g.) and maintained by the inhalation of nitrous oxide and oxygen from a standard Boyle's apparatus. Case 8 did not have soluble thiopentone. In cases 5–7, under the care of another anæsthetist, a small amount of 'Trilene' (trichlorethylene) had been added to the gas-and-oxygen mixture.

Great difficulty was experienced in anæsthetisin case 8, and some difficulty was also noted with cases 9–11 Their pupils were more dilated than is usual afte atropine gr. $^1/_{100}$, but no importance was attached t this at the time. No excessive drying of mucosæ o tachycardia was observed. Difficulty was experienced in "settling" the patients with gas and oxygen; they either reacted violently to the stimulus of the operation on a normal gas-and-oxygen mixture or passed into the stage of jactitation when the oxygen percentage was reduced to deepen the level of anæsthesia. The reaction to the surgical stimulus persisted even in the presence of extreme cyanosis. Case 8, who received no soluble thiopentone, was the most difficult to balance. With cases 5–7, who also received trilene, the other anæsthetist found no great difficulty.

The rate of recovery was normal in all cases—i.e., the patients were conscious before leaving the theatre, and sufficiently rational to recognise their own boots and jackets. While waiting to be taken back to the wards some of them fell asleep, and none showed any abnormality in behaviour.

DISCUSSION

The symptoms and signs of atropine poisoning may be divided into two classes: (1) those due to paralysis of postganglionic cholinergic nerves, in particular dilated pupils, with blurring of vision, hot dry skin, suppression of secretions and alterations in heart-rate; and (2) those due to central nervous derangement, which include restlessness, confusion, delirium, hallucinations, and muscular incoordination. It is easy for the attention to be diverted from the peripheral autonomic signs by the more striking central nervous signs. This was so with cases 8–11, who were first seen in delirium in a dimly lit ward. After recovery there is no recollection of what has occurred.

Atropine is absorbed rapidly into the body. About two-thirds is destroyed in the liver, and a third is excreted in the urine within fourteen hours. In case 8 delirium came on within two hours of the injection of a toxic dose, and in cases 9–11 it was noted within five hours. Extreme dilatation of the pupils and difficulty in anæsthetising was found in little over an hour after the injection. In cases 3, 4, 8, 9, and 10 all toxic symptoms and signs passed off within eighteen hours, and in cases 1, 2, and 11 symptoms persisted for only another two or ree hours. Surprisingly these three had the mildest mptoms in our series. It is not unusual for recovery be delayed for several days.

It is interesting that omnopon and scopolamine ietened case 9. Had the nature of the condition been cognised when this was ordered, scopolamine would t have been used because of its atropine-like action; it this appears to have been outweighed by its depressive tion on the central nervous system.

The difficulty in anæsthetising could be explained first ; the increased stimulation of the central nervous stem, especially the higher centres, and secondly by e basal metabolic rate, which is said to be raised ter atropinisation.

Doses up to gr. $^{1}/_{30}$ of atropine usually produce the fects of parasympathetic paralysis; gr. $^{1}/_{12}$ produces ese effects and restlessness; and doses of gr. $^{1}/_{8}$ or ore produce mental symptoms and ataxia. Nine atients (cases 5–13) received doses gr. $^{1}/_{6}$, which is n times the maximal pharmacopœial dose, yet only ur of them (cases 8–11) showed toxic effects. All were ealthy young men, who gave no history of having aken medicines containing atropine or similar drugs. t is therefore unlikely that any had an acquired tolerance. ndividual variations in susceptibility to atropine are ommon; but apart from this there are several possible easons for the tolerance of the remaining five.

Cases 5–7 were anæsthetised with trilene, which has more powerful and lasting depressive action on the entral nervous system than has gas-and-oxygen or oluble thiopentone in the small doses given to these atients. Perhaps this prevented the onset of restlessness nd delirium. Conversely, case 8, who was the most elirious of all, did not even have the benefit of depression due to soluble thiopentone. Case 7, who was not affected, had trilene, but not soluble thiopentone.

Case 12 had a very large collection of pus (about 2 pints) nd was very toxic. He was pale and weak and in great pain; his pulse was rapid and thin. Such patients, being already depressed by the action of bacterial toxins, sually require small amounts of anæsthetic, and it may ell be that they require correspondingly large doses of timulants to produce delirium. Case 13 is more difficult o explain. He also had a large collection of pus, but as not nearly so ill as case 12. He was a large man f dark complexion; his size may be significant but his omplexion is probably not. Cases 8–11 were all fair-omplexioned, but 3 of the earlier group of toxic patients ases 2–4) were dark. It has already been remarked that ases 8–11 were suboxygenated during anæsthesia, and his may have helped to precipitate the delirium. Case 8 he worst) had been the most deeply cyanosed, and in ll cases the delirium was not apparent until after næsthesia.

SUMMARY

Eight cases of acute poisoning from atropine used in remedication for anæsthesia are described.

Six of these patients developed acute delirium, but all ecovered completely.

Four of them and five others who showed no toxic igns are known to have received atropine sulphate r. $^{1}/_{6}$ as a result of an error in dispensing.

The symptoms and the difficulty in anæsthetising the atients are discussed.

Reasons are suggested for the tolerance of five patients o such a large dose.

Trilene anæsthesia appears to have antagonised the entral nervous actions of the atropine in three of these ases.

We wish to thank the Director-General of Army Medical ervices for permission to publish this paper. The cases ere treated in a military hospital overseas. The dispensing rror was made by a foreign civilian pharmacist, employed n the hospital dispensary, who was familiar with the metric system and confused by the Imperial system of dosage. We wish to thank our colleagues for permission to quote their cases and for help in the investigation.

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EXPERIMENTS WITH OCCLUSIVE DRESSINGS OF A NEW PLASTIC

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A FORM of dressing which will keep out both liquids and bacteria from an open wound has long been needed. The dressings now available commercially are mostly made of synthetic rubber-like materials such as polyvinyl chloride, which have the serious disadvantage of rendering the underlying skin sodden. The horny layer becomes macerated, the edges of wounds tend to gape, and there are many theoretical objections, such as the danger of washing bacteria from adjacent parts of the skin into the wound. The wetness of the skin comes not only from sweat-gland secretions but also from insensible perspiration.

Up to now it has been tacitly accepted that material which is waterproof must have this disadvantage, but in the search for suitable clothing for tropical warfare a new principle was established. A material can be proof against liquid water (and so keep off tropical rain) and yet be pervious to water vapour (thus allowing the sweat and insensible perspiration to evaporate underneath the clothing and pass through in vapour form). Applied to occlusive dressings this principle implies that a dressing can keep out liquids and yet allow evaporation from the underlying skin. Accordingly an approach was made to the technical plastic experts.

The range of plastics now available includes substances with a very high resistance to water in liquid and vapour form—e.g., polyvinyl chloride and 'Polythene.' It also includes other substances which are highly permeable to water vapour, such as 'Cellophane' (uncoated) and other cellulose derivatives, polyvinyl alcohol, and various 'Nylon' derivatives. The substances in each class vary enormously in their chemical and mechanical properties. Films of the cellophane-like substances, for example, though tested clinically by Bloom (1945) and others, are naturally brittle when dry, and are only kept pliable by the *incorporation* of plasticisers—e.g., glycerin and tricresyl phosphate. Even when plasticised they are relatively inelastic and can be torn easily at the edges of the film. Polyvinyl alcohol, unless specially treated, is soluble in water. Some of the newer nylon derivatives have excellent mechanical properties. They are tough, pliable in themselves without the addition of any plasticiser, and somewhat elastic.

EXPERIMENTAL NYLON-DERIVATIVE FILM

One of the nylon derivatives, offered to us in the form of experimental film, showed such promising qualities that it was decided to experiment with this substance. The absence of a plasticiser is particularly desirable, since the film is unlikely to change its properties, and there are no risks of toxic effects when it is applied to the surface of an open wound.

The film has been supplied to us in sheets having an even thickness of about $^{3}/_{1000}$ in. It is fully transparent, and even in this thickness quite tough. It can be sterilised by dry heat at 150°C without deterioration, though it cannot be boiled in water without softening and adhering to itself. Though soluble in 80% alcohol it is insoluble in most of the common industrial solvents—e.g., trilene, oils, cold water, weak acids, and alkalis. Its permeability to water vapour in a thickness of $^{1}/_{1000}$ in. is about 8000 g. per 100 sq. m. per hour at 40°C, with a differential water-vapour pressure across the film equivalent to 53 mm. Hg. This permeability is of the same order as that of cellophane, and may be compared with the hourly water-vapour loss from the total human body surface (about 1·8 sq. m.) of about 20–25 g. of insensible perspiration. The corresponding figures for plastics of low water-vapour permeability, such as polythene, are about 60 g. per 100 sq. m. per hour under the above conditions.

Tests on the Film as a Barrier to Micro-organisms

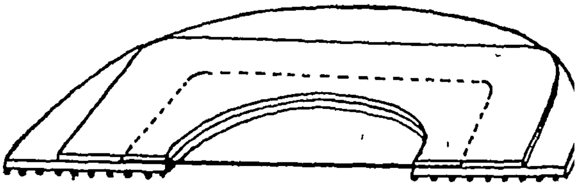
By means of experiments with a dressing applied to a model limb Dr. L. Colebrook (personal communication) has shown that micro-organisms readily pass through dressings as soon as they become moist with water or with serum. The dressings tested included cotton-wool pads carefully applied under crêpe bandages. The organisms which pass most readily through these dressings are motile, such as *Ps. pyocyanea*. Non-motile organisms—e.g., hæmolytic streptococci—can also pass through, though more slowly. For comparative purposes it was decided to test the ability of the plastic film to restrain the passage of *Ps. pyocyanea.* The most exacting conditions were ensured by containing a small quantity of broth-culture of the organism inside a sac made of the plastic and immersing it in sterile broth. At 24 hours the surrounding broth was still sterile, though the pigment from the bacterial culture had diffused through the plastic membrane. Similarly, a moist dressing incorporating the nylon-derivative film on a mock limb effectively stopped the passage of the organisms. Other experiments showed that, though electrolytes passed through the film, particles as large as hæmoglobin were restrained. These tests showed conclusively that the film was free from pin-holes and was an efficient barrier against bacteria.

Tests on Human Skin

Though theoretically the water-vapour permeability of the plastic was great enough to allow the passage of all the insensible perspiration from the skin, it is impossible to mimic the conditions of a dressing perfectly by in-vitro tests. Accordingly two pieces of film, each about 4 in. square, were applied to the forearm, and the edges sealed down with adhesive plaster. One piece of film was polythene, with a low water-vapour permeability, and the other was the selected nylon derivative. Within two hours the difference between the two films was apparent. The impermeable film had beneath it a thin layer of liquid water, which ran from one part of the "dressing" to another when it was squeezed against the skin of different areas. In contrast, the skin under the nylon-derivative film appeared normal. After removal of the films the skin under the polythene was obviously sodden, and several minutes elapsed before the water had evaporated sufficiently to allow a finger run over the area to detect the normal smooth and somewhat slippery surface of dry skin, whereas the skin beneath the nylon-derivative film looked and felt dry. This finding was confirmed under dressings worn much longer (up to ten days). These experiments confirm that the skin under the experimental nylon-derivative film is unlikely to become excessively moist.

Difficulties of Sealing a Plastic Film Dressing

The difficulties of sealing a film to the skin round the edges so as to ensure completely waterproof protection under conditions comparable with those that the workman would encounter with his hands are very great. Initi experiments were made with a finger-stall of the plast film, but it was very difficult with available adhesives a "sticking plaster" to ensure a complete seal round t base of the finger. With the coöperation of Mess Smith & Nephew a partial answer to the problem has be obtained by using "window frames" made of polyvin material coated with adhesive. The nylon-derivati film is incorporated at its edges between two layers of t adhesive polyvinyl material, leaving one adhesive surfa for application to the underlying skin (see figure). The windows adhere satisfactorily to the skin for day provided that the skin is free from grease when they a first applied and is not too heavily coated with hair. Wh oil is rubbed over the dressing, the adhesive is loosened a the dressing tends to ride up. For the special circu stances of workers in oils, therefore, some addition forms of attachment may be required—e.g., painti over the edges of the adhesive with acrylic resin. any case, if the part covered is to be subjected to appre able mechanical strain or friction, the dressing is be held in place with a light cover of plain or crêpe bandag In industry this bandage could be changed daily, leavi the underlying plastic seal untouched, thus permitti safe inspection of the wound and cosmetic cleanline of the outer cover. In short, though other practic difficulties may no doubt arise, the possibility of a effective bacteria-proof dressing which will leave t underlying skin in a normal state has been demonstrate



Diagrammatic section of occlusive dressing, showing upper adhes frame, transparent nylon-derivative film, and lower adhesive fra with protective crinoline (dotted line).

Effect on Skin Bacteriology

Before conducting therapeutic trials of the value such a dressing applied to wounds, it was though desirable to determine the effect of such a dressing o the bacteriology of normal skin. This trial has consider able theoretical interest in addition to its possible futur practical applications. It is known that the norma skin has appreciable self-sterilising properties against many organisms. These properties probably reside mainly in its fatty-acid content, though they may also be assisted by the action of lysosyme and other substances (Burtenshaw 1945). The bacteriology of ordinary skin exposed to the air, contact with the nose, &c., is complicated by many bacteria which can be regarded as simple surface contaminants. What will be the effect of covering the skin in such a way as to remove the possibility of surface contamination for days? The experiment is of special importance with regard to *Staph. aureus*. Studies by Williams and Miles (1945) have shown that this is the commonest contaminating organism of small wounds, and is probably the major cause of sepsis in small wounds in industry. Many studies, including a recent report from this unit (Moss et al. 1948), have indicated that the main source of these organisms, both in wounds and on normal skin, is the nose.

If normal skin is covered with the plastic dressing for different periods of days, a characteristic change in the bacterial flora is observed. In an investigation of the skin of hospital patients, control areas before application of the dressing and adjoining areas at the time of its removal yielded *Staph. aureus* in 39 out of 77 cases (50·6%). The methods of swab culture were designed

demonstrate *Staph. aureus* in small numbers and there-
e included an anaerobic broth technique as well as
robic culture on blood-agar plates (Williams and Miles
45). In a series of 24 observations *Staph. aureus* has
ver been recovered from under plastic dressings which
ve remained firmly sealed for three days or more,
ough in 14 of these it was recovered from the adjoining
in. This observed difference is statistically highly
nificant ($\chi^2 = 10{\cdot}8$, $P = 0{\cdot}001$).

Examination of the direct blood-agar plate not only
pplied data on the presence or absence of *Staph. aureus*
t also revealed another difference between normal and
cluded skin. The occluded skin yielded only a few
pes of bacterial colonies in contrast to the adjoining
in, from which a great variety of colonies were isolated.
rther investigation of the organisms which survive on
e occluded skin shows them to be gram-positive
agulase-negative cocci, most of which give biochemical
actions similar to those of *Staph. epidermidis*. That
ese effects on the bacterial flora are not due to any
tiseptic action of the nylon derivative is demonstrated
in-vitro control tests. *It is thus clear that normal*
in, cut off from outside contamination, can free itself
om such pathogenic organisms as *Staph. aureus*.

In-vitro tests showed that penicillin was not inacti-
ted by the film. Tragacanth is a convenient vehicle
r the application of penicillin under the dressings, since
does not loosen the adhesive. Under completely
aled dressings penicillin in tragacanth (0·2 ml. of
),000 units per ml.) dried to form a continuous pellicle,
d in several cases the occluded skin was found to be
erile.

rial as Wound Dressing

A clinical trial of the dressings for industrial and other
ounds is now in progress. Preliminary results show
at such a dressing is practicable and that wounds
der it remain dry and heal well. The transparency of
e film makes it possible to inspect the progress of healing
ithout disturbing the aseptic barrier. Exposure to
l may interfere with adhesion; this can be partly
bviated by wearing a bandage over the dressing, and
is bandage can be changed as required. When a
omplete seal is maintained, added infection cannot
ake place, though sepsis cannot always be prevented
the wound is infected before the dressing is applied.

DISCUSSION

These experiments with a plastic film which combines
atisfactory mechanical properties with a high perme-
bility to water vapour demonstrate its suitability as
dressing material. Under this material skin remains
ry and free from contamination and its considerable
antibacterial powers are given full scope. The design
of the dressings can doubtless be modified to facilitate
application to particular areas and to improve adhesion,
but it is felt that the principle of a dressing sealed but
permeable to water vapour has now been established.

The nylon-derivative material used was an experi-
mental batch, and further supplies are not yet obtainable.

SUMMARY

The physical properties (in particular water-vapour
permeability) of a nylon-derivative film suitable for
wound dressings are described.

The film is an effective barrier against micro-organisms.

Tested on human skin, the permeability of this film
to water vapour is sufficient to prevent the skin becoming
odden.

The bacterial flora of the healthy skin under the
cclusive dressing becomes modified: *Staph. aureus*
isappears, and the variety of organisms is reduced.

Clinical trials with the film as a wound dressing are
n progress, and preliminary results are promising.

We are indebted to Dr. Leonard Colebrook, director of the Medical Research Council Burns Unit, for his advice; to Mr. A. M. Hood for some of the bacteriological work; and to Mr. J. C. Swallow, PH.D., and his colleagues of the Plastics Division of Imperial Chemical Industries Ltd., to Messrs. Courtaulds Ltd., and to Messrs. T. J. Smith & Nephew Ltd., for their assistance in the development of the occlusive dressing.

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VITAMIN E (TOCOPHEROLS) IN THE COLLAGENOSES

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The increasing recognition of the importance of vitamin E (mixed tocopherols) in health and in disease and the knowledge gained from clinical and histopathological studies in certain dermatoses warrant a brief summary of its therapeutic uses.

Vitamin E consists of several fat-soluble tocopherols, of which α, β, γ, and δ tocopherols have been isolated in their natural state: α-tocopherol is found in cotton-seed oil and is also produced synthetically; β-tocopherol is obtained from wheat germ; and γ-tocopherol and δ-tocopherol are derived from soya bean. The natural tocopherols are extracted by vacuum distillation from these various sources.* Vitamin E is therefore called here vitamin-E complex.

ATOPIC DERMATITIS

As a result of personal observations, a series of cases of atopic dermatitis were treated over a period of nearly a year with vitamin-E complex by mouth. In several cases sebaceous secretion increased, with the appearance of comedones and dilated follicles where these had not been present before, together with exacerbation of a pityriasis capitis often accompanied by greasy scales indicating seborrhœic dermatitis. In the absence of any signs pointing to endocrine overactivity, it was thought that vitamin-E complex might possibly affect sebaceous-gland activity and therefore fat-metabolism. Harris et al. (1947) have reported the stimulating effect of vitamin-E complex on quantity and quality (increased cream) in the production of cow's milk.

GRANULOMATOUS ULCER OF LEG

A long-standing case of granulomatous ulcer of the leg, compatible with a diagnosis of necrobiosis diabeticorum lipoidica and characterised histopathologically by the presence of necrobiotic collagenous zones with lipoidal deposition, was treated with 2000 mg. of mixed tocopherols given intramuscularly in ten days (Burgess and Pritchard 1948a). (In the light of more experience intramuscular injections of 100–300 mg. of mixed tocopherols twice weekly are better tolerated.) Favourable response was evident clinically within a week, and the patient, a female aged 53, was treated with mixed tocopherols by mouth for four months. Histopathological studies a month after the institution of therapy and again four months later, long after clinical cure, revealed the important finding that, coincident with the disappearance of lipoidal depositions, a considerable regeneration of degenerated collagen bundles had resulted, and indeed a demonstrable re-formation and rehabilitation of elastic-tissue fibres. Three months after the treatment had been stopped ulcers recurred

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* Distillation Products Inc., Rochester, N.Y.

The film has been supplied to us in sheets having an even thickness of about $^{3}/_{1000}$ in. It is fully transparent, and even in this thickness quite tough. It can be sterilised by dry heat at 150°C without deterioration, though it cannot be boiled in water without softening and adhering to itself. Though soluble in 80% alcohol it is insoluble in most of the common industrial solvents—e.g., trilene, oils, cold water, weak acids, and alkalis. Its permeability to water vapour in a thickness of $^{1}/_{1000}$ in. is about 8000 g. per 100 sq. m. per hour at 40°C, with a differential water-vapour pressure across the film equivalent to 53 mm. Hg. This permeability is of the same order as that of cellophane, and may be compared with the hourly water-vapour loss from the total human body surface (about 1·8 sq. m.) of about 20–25 g. of insensible perspiration. The corresponding figures for plastics of low water-vapour permeability, such as polythene, are about 60 g. per 100 sq. m. per hour under the above conditions.

Tests on the Film as a Barrier to Micro-organisms

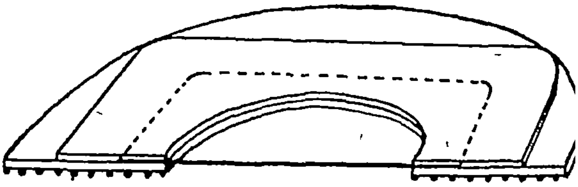
By means of experiments with a dressing applied to a model limb Dr. L. Colebrook (personal communication) has shown that micro-organisms readily pass through dressings as soon as they become moist with water or with serum. The dressings tested included cotton-wool pads carefully applied under crêpe bandages. The organisms which pass most readily through these dressings are motile, such as *Ps. pyocyanea*. Non-motile organisms —e.g., hæmolytic streptococci—can also pass through, though more slowly. For comparative purposes it was decided to test the ability of the plastic film to restrain the passage of *Ps. pyocyanea*. The most exacting conditions were ensured by containing a small quantity of broth-culture of the organism inside a sac made of the plastic and immersing it in sterile broth. At 24 hours the surrounding broth was still sterile, though the pigment from the bacterial culture had diffused through the plastic membrane. Similarly, a moist dressing incorporating the nylon-derivative film on a mock limb effectively stopped the passage of the organisms. Other experiments showed that, though electrolytes passed through the film, particles as large as hæmoglobin were restrained. These tests showed conclusively that the film was free from pin-holes and was an efficient barrier against bacteria.

Tests on Human Skin

Though theoretically the water-vapour permeability of the plastic was great enough to allow the passage of all the insensible perspiration from the skin, it is impossible to mimic the conditions of a dressing perfectly by in-vitro tests. Accordingly two pieces of film, each about 4 in. square, were applied to the forearm, and the edges sealed down with adhesive plaster. One piece of film was polythene, with a low water-vapour permeability, and the other was the selected nylon derivative. Within two hours the difference between the two films was apparent. The impermeable film had beneath it a thin layer of liquid water, which ran from one part of the "dressing" to another when it was squeezed against the skin of different areas. In contrast, the skin under the nylon-derivative film appeared normal. After removal of the films the skin under the polythene was obviously sodden, and several minutes elapsed before the water had evaporated sufficiently to allow a finger run over the area to detect the normal smooth and somewhat slippery surface of dry skin, whereas the skin beneath the nylon-derivative film looked and felt dry. This finding was confirmed under dressings worn much longer (up to ten days). These experiments confirm that the skin under the experimental nylon-derivative film is unlikely to become excessively moist.

Difficulties of Sealing a Plastic Film Dressing

The difficulties of sealing a film to the skin round the edges so as to ensure completely waterproof protection under conditions comparable with those that the workman would encounter with his hands are very great. Initi experiments were made with a finger-stall of the plas film, but it was very difficult with available adhesives ar "sticking plaster" to ensure a complete seal round t base of the finger. With the coöperation of Mess Smith & Nephew a partial answer to the problem has be obtained by using "window frames" made of polyvin material coated with adhesive. The nylon-derivati film is incorporated at its edges between two layers of t adhesive polyvinyl material, leaving one adhesive surfa for application to the underlying skin (see figure). The windows adhere satisfactorily to the skin for day provided that the skin is free from grease when they a first applied and is not too heavily coated with hair. Whe oil is rubbed over the dressing, the adhesive is loosened ar the dressing tends to ride up. For the special circun stances of workers in oils, therefore, some addition forms of attachment may be required—e.g., paintir over the edges of the adhesive with acrylic resin. I any case, if the part covered is to be subjected to appre able mechanical strain or friction, the dressing is be held in place with a light cover of plain or crêpe bandag In industry this bandage could be changed daily, leavin the underlying plastic seal untouched, thus permittin safe inspection of the wound and cosmetic cleanline of the outer cover. In short, though other practic difficulties may no doubt arise, the possibility of a effective bacteria-proof dressing which will leave th underlying skin in a normal state has been demonstrate



Diagrammatic section of occlusive dressing, showing upper adhes frame, transparent nylon-derivative film, and lower adhesive fra with protective crinoline (dotted line).

Effect on Skin Bacteriology

Before conducting therapeutic trials of the value o such a dressing applied to wounds, it was though desirable to determine the effect of such a dressing o the bacteriology of normal skin. This trial has consider able theoretical interest in addition to its possible futur practical applications. It is known that the norma skin has appreciable self-sterilising properties against many organisms. These properties probably reside mainly in its fatty-acid content, though they may also be assisted by the action of lysosyme and other substances (Burtenshaw 1945). The bacteriology of ordinary skin exposed to the air, contact with the nose, &c., is complicated by many bacteria which can be regarded as simple surface contaminants. What will be the effect of covering the skin in such a way as to remove the possibility of surface contamination for days? The experiment is of special importance with regard to *Staph. aureus*. Studies by Williams and Miles (1945) have shown that this is the commonest contaminating organism of small wounds, and is probably the major cause of sepsis in small wounds in industry. Many studies, including a recent report from this unit (Moss et al. 1948), have indicated that the main source of the organisms, both in wounds and on normal skin, is the nose.

If normal skin is covered with the plastic dressing for different periods of days, a characteristic change in the bacterial flora is observed. In an investigation of the skin of hospital patients, control areas before application of the dressing and adjoining areas at the time of its removal yielded *Staph. aureus* in 39 out of 77 cases (50·6%). The methods of swab culture were designed

which, however, yielded satisfactorily to further treatment with vitamin-E complex.

LUPUS ERYTHEMATOSUS

It was logical, in view of the grouping by Klemperer et al. (1941) of certain diseases with a common collagenous degeneration, that such diseases should be similarly investigated therapeutically. Our attention was consequently directed to lupus erythematosus, and the results of therapy in 25 cases have been studied clinically and histopathologically (Burgess and Pritchard 1948b). The value of treatment with mixed tocopherols in this disease was very favourable, with some reservations. All the cases treated were of the more or less widespread but fixed types. Superficial cases of lupus erythematosus, no matter how old, responded almost specifically to tocopherol therapy in doses of 100–300 mg. by mouth. Long-standing cases with much infiltration, follicular plugging, and evident sclerosis and fibrosis yielded partially to treatment much more slowly on vitamin-E complex 300–600 mg. daily, best administered on an empty stomach. One case of long standing, with a good deal of thickening in plaques on the face, yielded only slightly in that the thickening disappeared early. In some of these cases obvious but irremovable foci of infection would have a detrimental effect on the therapeutic value of curative agents. The severe cases were those encountered in the clinic, whereas superficial lesions yielding very satisfactorily to vitamin-E complex were seen in private practice. This probably has to do with relative adequacy of diet.

Histopathological studies in lupus erythematosus revealed that, apart from the inflammatory cellular reaction, evidence of collagenous degeneration was difficult to demonstrate in superficial lesions, whereas in old-standing infiltrative lesions sclerosis of the collagenous bundles was evident. Inflammatory infiltrates generally disappeared relatively rapidly and, in chronic cases with marked thickening, partial regeneration of collagenous tissue was demonstrable. A considerable hypertrophy of the epithelial layer of the skin and follicles is constantly found in lupus erythematosus; therefore it is an important fact that this hypertrophy disappeared relatively early in the course of treatment. In some apparently cured cases lupus erythematosus recurred. It is obvious that either total histopathological regeneration had not resulted and the treatment had been stopped too soon, or these patients required the administration of mixed tocopherols daily to maintain a satisfactory tissue-tocopherol level consistent with their normal needs. One case of twenty-five years' duration recurred, after cure, while still under treatment with tocopherol. After the extraction of three infected teeth the response to continued tocopherol therapy was rapid, illustrating the point that the factor of infection should not be overlooked and that the tocopherols should be looked on as aids in treatment in conjunction with other sound well-proved measures.

Those patients who were photosensitive did exceedingly well under this form of therapy. Photosensitivity was lost, and the patients could go about in the sun in normal fashion and get tanned.

SCLEROSIS OF THE LEGS

Our attention was next directed to sclerosis of the legs, associated with ulcers (Burgess and Pritchard 1948c). Shute et al. (1948) have also reported the results of treatment of leg ulcers with vitamin E. The clinical picture in these cases is consistently the same. Leg ulcers, with or without eczematisation, develop commonly in the lower third of one or both legs and are not infrequently viewed as "stasis" or "varicose" ulcers, particularly if œdema is present. The clinical picture is made up of a more or less sclerotic condition of the legs, in some patients only moderately apparent through "feel," in others the skin being hidebound, resulting in limitation of ankle movements (with or without varicosities, which are often present to a minor degree), together with single or multiple ulcers, often callous, and of long duration or of frequent recurrence.

In the present series we tried to assess tocopherol therapy without other additive measures such as compresses, antiseptic ointments, and complete rest in bed. The results were particularly good in that the sclerosis disappeared with the healing of the ulcers. The older the patient, the greater the fixity of the sclerotic process and hence slower response to therapy. Cure of the infective ulcerative process is undoubtedly hastened if tocopherol therapy is combined with other measures, notably antibiotic remedies either applied locally or given parenterally.

OTHER COLLAGENOSES

Experience with dermatomyositis, lichen sclerosis et atrophicus, scleroderma, morphea, and granuloma annulare has shown varied response to tocopherol therapy but in the main favourable. These observations parallel the experiences of Brigadier R. M. B. MacKenna (personal communication).

DISCUSSION

In our studies, clinical observation of the results of treatment with mixed tocopherols in the enumerated diseases with a common degenerative collagenous state has been closely correlated with histopathological studies. Further, vitamin-E complex has been given both intramuscularly and by mouth, without the administration of vitamins A, B, or C, which might lead to uncertainty in assessing the results.

Action of Vitamin-E Complex.—The possible synergistic or sparing action of vitamin E on vitamin A, B, or C could only have an effect on what might be absorbed in the daily food intake. This synergistic action may be the rôle of vitamin-E complex but it does not seem logical or probable. On the other hand, it seems much more likely that vitamin-E complex exerts a profound influence on enzymatic reactions within the cells—e.g., that of hyaluronidase. In the vegetable world where the tocopherols are created (the synthesis of vitamin E by animals or by bacteria has not been reported) the association is again with the cytoplasm rather than with th oil depots (Hickman and Harris 1946). The tocopherols a known to exert an antioxidant action, as Hickman an Harris point out, and they are profoundly necessary in th maintenance of the structure of the cells whereby th cells through enzymatic action further coördinate othe metabolic activities.

Infection.—Lupus erythematosus, necrobiosis wit ulcer formation, dermatomyositis, granuloma annular and sclerosis of the legs with ulcer formation are al associated with infection either in situ or in some othe part of the body. It is possible that scleroderma ma be precipitated by obscure infections. Common bana infections (streptococcal, staphylococcal, &c.) are easil demonstrated in leg ulcers, discharges, &c. Perhap virus infections may be not unimportant in the collagenoses. The sclerosis in cases of leg ulcer is alway much more pronounced in the ulcerated leg. It may be that infection causes the sclerosis or that the sclerosis once present, is exaggerated by the presence of infection. That trauma is a factor in these leg-ulcer cases is shown by the fact that numerous incisions made for biopsy of sclerotic tissue before treatment have become the site of ulcers indistinguishable from those for which the patient sought treatment. We have had similar experience in a biopsy wound of the wrist through a plaque of morphea showing neither infection nor circulatory change.

After-treatment.—In all these cases of degenerative collagenoses where apparent cure has been obtained with vitamin-E complex further treatment is needed to retain the patient's health. The normal intake of vitamin E in food is about 15–30 mg. daily. Therefore patients with these degenerative states cannot acquire, assimilate, or utilise to advantage vitamin-E complex in the daily food intake. It may therefore be necessary to give large amounts of the concentrated product. Perhaps in large doses vitamin-E complex exerts an antioxidant action, whereas in normal amounts it does not. More knowledge will be gained about requirements for prevention in individual cases. However, it is suggested that for a long time various amounts of crude wheat germ which has not been defatted should be added daily to the diet.

The skin is perhaps one of the largest and one of the most underestimated organs of the body. It is the most accessible and the most easily observed, and the pathological changes are but a mirror of those which may affect many organs. Further, the highest normal concentrations of vitamin E appear in the spleen, lungs, and muscle of the heart (Hickman and Harris 1946). Numerous reports have already appeared about its value in various diseases. The applicability of vitamin-E complex in many other degenerative diseases may therefore be justified.

I am grateful to Abbott Laboratories for liberal amounts of vitamin E, and to British Drug Houses for further supplies.

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OCCUPATIONAL ANEURYSM OF THE PALMAR ARCH

REPORT OF A CASE

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Aneurysms of the palmar arteries are usually traumatic. Most are false aneurysms which have developed after a penetrating wound of the palm, the term "false" being reserved for cases where no part of the aneurysm sac is derived from the parent wall. True aneurysms are rare. Middleton (1933) collected 16 reported cases of true palmar aneurysm. Of these, 14 were associated with trauma, and 2 were regarded as having developed spontaneously. Middleton subdivided the traumatic true aneurysms into two classes: (1) acute, where the aneurysm followed a single definite contusion; and (2) chronic or occupational, where the condition followed repeated minor injuries. Of Middleton's collected cases, 6 were examples of occupational true aneurysm, and he contributed 2 more of his own. I have found accounts of 2 other cases, and report here 1 of my own.

Michans et al. (1936) reported one in an old woman of 68 and attributed it to the use of a rolling-pin. A tumour had been present in the hypothenar eminence for $2^{1}/_{2}$ years, and it had gradually swollen until, at the time of examination, it was about 2 in. in diameter. It was soft and reducible and had a palpable but not visible pulsation, and on auscultation over the swelling a systolic murmur of medium intensity was heard.

Gee (1945) described another case in a soldier, who had a tender swelling in the left hypothenar eminence, which had appeared 3 months previously when he had had to man the pumps intermittently for nearly 4 days. The lump had gradually enlarged and become more tender. It was a tense cystic swelling, 1 in. long by $^{3}/_{4}$ in. wide. Expansile pulsation could be felt, but there was no audible bruit.

In neither of these cases was there any neurological or vascular disturbance of the hand.

CASE-RECORD

A marine engineer, aged 28, came to the orthopædic department complaining of a tender lump in his right palm of 6–7 weeks' duration.

He had served in the Merchant Navy for about 5 years. About 9 months previously he had been transferred to a ship with a stiff reversing lever, which he shifted by hammering with the "heel" of his right hand. After doing this for about 2 months, he had begun to have a continual bruised feeling at the base of the thumb, and he had noted increasing tenderness over this area, and a swelling which appeared to become larger.

On examination there was an almond-shaped tumour about an inch long at the base of the hypothenar eminence and just distal to the pisiform bone. It seemed to be deep to the palmar fascia and was not attached to the overlying structures. It was not mobile or pulsatile and felt like a cyst. There was no impairment of movement of wrist or fingers or any other abnormality. The Wassermann reaction was negative.

Operation.—The swelling was explored after a tourniquet had been applied. It was found to be a saccular aneurysm arising from the superficial palmar arch immediately distal to the deep branch of the ulnar artery. It was not adherent to the surrounding tissues, and the adjacent ulnar nerve appeared healthy. The artery was ligated proximal and distal to the aneurysm, and the sac was excised. The saccular dilatation arose from the superficial aspect of the artery. It was about three-quarters of an inch long, with a thin smooth bluish wall, and was filled with firmly adherent thrombus.

Pathological report (Dr. R. I. Shaw Dunn).—"An aneurysmal sac measuring 8 × 6 × 5 mm. is present and it contains laminated thrombus. The wall of the sac is thin and partly atrophic, with small deposits of altered blood in its substance. Reactive changes are seen, with organisation of the periphery of the thrombus."

Progress was uneventful, and the patient returned to work a month later.

DISCUSSION

Traumatic true aneurysms in the palm are very uncommon. Though they have occasionally arisen from various parts of the superficial and, more rarely, the deep palmar arches, most of them are associated with the ulnar artery and are found deep to the inner border of the hypothenar eminence.

The clinical diagnosis may be difficult, especially when, because of their site and because the aneurysmal sac is filled with organising thrombus, no pulsation is detectable. Bradley (1945) described an acute true aneurysm in which no pulsation was felt, and in his view this is often so. Wapshaw (1936) suggested that a preliminary aspiration might be useful in diagnosis. Gee (1945), in his case, made two unsuccessful attempts to aspirate blood, and subsequently at operation found that the needles had entered the sac of the aneurysm but it was completely occluded by organising clot.

The first symptoms have often been a persistent bruised feeling, with a tender swelling appearing later. Sensory disturbances are sometimes prominent; but, in view of the close proximity of the ulnar nerve, it is interesting that such symptoms are so frequently absent. Neurological signs are more commonly present in false aneurysms, but here, in some cases at least, the neurological upset is probably due to the original injury rather than to the aneurysm.

SUMMARY

A case of true occupational aneurysm of the superficial palmar arch is reported.

The term "occupational" is reserved for those aneurysms attributed to repeated minor injuries—in

this case the practice of hammering a stiff lever with the palm of the hand.

The first symptom was a persistent bruised feeling, which was first noted about two months after the patient had started this practice, and the swelling was noted four months later.

The operative findings and subsequent progress are described.

This is a rare condition, and only 10 other published cases were found.

I wish to thank Mr. J. Patrick, surgeon-in-charge, orthopædic department, Glasgow Royal Infirmary, for permission to publish this case; Dr. R. I. Shaw Dunn for his report on the pathological specimen; and Prof. J. W. S. Blacklock, of the department of pathology, Glasgow Royal Infirmary, for permission to publish this report.

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ASSOCIATED ECTOPIC ANUS AND UTERUS DIDELPHYS

REPORT OF A CASE

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A GIRL first attended Westminster Hospital in 1934 at the age of 18 months. At birth her anus had been found to be in the fourchette. This opening had proved inadequate, and an inguinal colostomy had been performed at the age of 4 months.

The ectopic anus barely admitted a lead pencil; it was not dilatable, and there was no sign of a sphincter. The skin of the natal cleft at the normal site for an anus contracted on stimulation, suggesting that the sphincter was present in the normal position. The anus and anal canal were therefore dissected free and transferred to the normal position, to open through a well-defined mass of muscle-fibres lying just under the skin. No abnormality of the vagina was noted at this time. The new anus was kept dilated at regular intervals for some months, and after two years the colostomy was closed, the child then being 3½ years old. The new anus worked very well, and after a year or two the patient was lost sight of.

The patient reappeared at the age of 13 years in September, 1945, at the outpatient department at Westminster Hospital. The presenting symptom was an offensive vaginal discharge noted fourteen days after her first menstrual period two months previously and continuous since then.

The previous operation appeared satisfactory; the anus was lax, but there was an active anal reflex. The mother said that control was normal. There was a profuse offensive vaginal discharge, the exact origin of which could not be seen.

In December, 1945, the patient was admitted to hospital for investigation. Examination under anæsthesia revealed that the discharge was coming through a small sinus high up in the right lateral fornix, and that pressure on the right lateral wall of the vagina, which was bulging medially, produced a profuse brownish discharge, suggesting that the sinus led into a cavity lying beside the vagina. The cervix and uterus appeared to be small, but otherwise normal. After a radio-opaque fluid had been injected through the sinus, radiography showed a cavity lying to the right of the vagina and extending from level of the vaginal vault to that of the vulva. This was thought to be probably a dermoid cyst associated with the congenital malformation of the proctodæum.

An attempt was made to remove this cyst by dissection through the perineum. Owing to great difficulty in dissecting the cyst from the vaginal wall, however, the incision, which was made along the line of junction of the right labium minor with the right vaginal wall, was carried through into the cyst, and the extent of the cyst was explored. The cyst contained a large quantity of foul-smelling grumous fluid with numerous small crystals of cholesterin. After this had all escaped, a speculum was passed into the cavity, and a small cervix was seen protruding into the vault. In fact there was a uterus didelphys, with a septate vagina, the right labium minus meeting the septum and not the right lateral wall of the vagina. Hence a unilateral hæmatocolpos had resulted which was slowly discharging through the small sinus connecting the two halves of the vagina at their upper ends. As much as possible of the septum in the vagina was removed, and the right labium minor was joined to the right lateral wall of the vagina.

Postoperatively the patient made an uninterrupted recovery. When seen as an outpatient two months later she had still a slight discharge vaginally, but it was no longer offensive.

I wish to thank Mr. G. T. Mullally for his helpful criticism and permission to publish this report.

PYLORIC OBSTRUCTION WITH TETANY AND COMA

REPORT OF A CASE

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THE case reported here presented problems of diagnosis largely as a result of the absence of a history at the time of admission.

A naval shipwright, aged 42, was admitted at 2.30 P.M. on May 24, 1942, with 3 days' history of constipation. He denied any other symptoms and would not give further information in response to leading questions.

It was only revealed during his convalescence that he had deliberately concealed a long history of indigestion and had instructed his wife to do the same, through fear of losing his job.

On admission: temperature 96·4°F, pulse-rate 61 per min. Grossly emaciated, with sunken cheeks and hollow eyes betokening severe dehydration. Rectum empty; a simple enema gave no result. Abdomen retracted, but no mass or abnormality detected.

May 25: general condition had deteriorated. At 9 A.M. another enema was given, with poor fæcal result. At 11 A.M. patient vomited a few ounces of black fluid. Hiccuping started. Patient was now only semiconscious, and twitchings in the limbs were noted. At 1 P.M. he was unconscious and a convulsion started. No focal point evident. A tonic spasm, with inhibition of respiration, was followed by a period of relaxation and stertorous breathing. On examination after seizure, no abnormality in reflexes, tone, or muscular power was demonstrable. Fundi normal; pupils reacted to light and accommodation. Blood-pressure 108/67 mm. Hg, pulse-rate 60 per min. Urine contained albumin but no other abnormality.

Blood-count: red cells 5,160,000 per c.mm., Hb (Sahli) 110%, colour-index 1·06; white cells 14,200 per c.mm. (polymorphs 75%, lymphocytes 11%, large mononuclears 13%, eosinophils 1%). Blood-urea 124 mg. per 100 ml.

Cerebrospinal fluid: 3 ml. of clear fluid; cells 2 per c.mm., most being lymphocytes; protein 70 mg. per 100 ml.; globulin normal.

Differential diagnosis made by physician in charge: (1) secondary deposits in brain from carcinoma of stomach; and (2) uræmic convulsions associated with alkalosis of unknown cause.

May 26: patient still unconscious, with periods of semi-consciousness. His condition being grave, surgical opinion was sought. Now showed advanced emaciation and dehydration; abdomen board-like all over; respiration entirely thoracic; liver dullness appreciably diminished; soft fæces in rectum; bladder slightly distended; no abnormality found in rectum or pelvis. It was decided that immediate laparotomy offered the only hope of saving the patient's life; and generalised peritonitis was tentatively diagnosed. The fits, hæmoconcentration, and high blood-urea level remained unexplained.

Urine just before operation: sp. gr. 1014; reaction neutral; a cloud of albumin; no sugar; many polymorphs and some epithelial cells and red cells; no casts.

Intravenous drip infusion of saline and glucose was set up as soon as the decision to operate had been made.

Operation (May 26).—A midline upper abdominal laparotomy was performed under local infiltration anæsthesia with 1 in 1000 'Nupercaine' assisted by gas-and-oxygen inhalation and a trace of ether. There was no free fluid or peritonitis; stomach enormously hypertrophied and moderately distended; duodenum beyond pyloroduodenal junction collapsed and shrunken to a diameter of $^3/_4$ in. Clearly an advanced stenosis from duodenal ulceration was present. Radial streaks of white were seen in mesentery of upper jejunum, looking like fine pieces of string lying in subperitoneal tissue. Stomach was emptied of thick foul black fluid with stomach-tube passed by anæsthetist. Gastrojejunostomy was rapidly performed. During operation patient stopped breathing several times and required artificial respiration. After operation patient was kept on operating-table $1^1/_2$ hours before it was considered advisable to move him to his bed.

In the theatre and later in the ward the following ancillary treatment was given: (1) intravenous infusion of isotonic glucose and saline, which had been set up before operation, was continued postoperatively for 24 hours; (2) inhalation of oxygen and carbon dioxide was continued for 6 hours after the anæsthesia had ceased; (3) stomach-tube was left in for 24 hours; and (4) foot of bed was raised so that bed was at an angle of 15° from horizontal.

Postoperative progress.—Patient regained consciousness at 10 A.M.—i.e., 22 hours after the operation. Memory had been much affected by the illness: he said he had a hazy recollection of some events on May 22, but that nothing remained in his mind from that date until the morning after the operation. He was told by his wife that he had made morning tea on May 23, but he had no recollection of this. This five-day amnesia remained permanently.

Intravenous fluids, including hypertonic saline to raise the blood-chlorides, were stopped at 2.30 P.M. on May 27 after 5 pints had been given. Watery drinks by mouth were tolerated well.

May 28: milky drinks were started on this day and were much appreciated by the patient; and 10 ml. of 10% calcium gluconate was given intravenously. He slept almost the whole day except for his feeds, which did not disturb him, because he went instantly to sleep after each one.

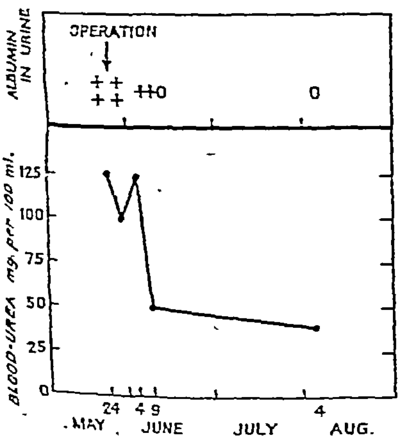

Fig. 1—Chart showing albumin in the urine and fall in blood-urea level after operation.

Subsequent progress.—Apart from a few bouts of hiccup in the next few days, the patient continued to make excellent progress. On June 1 he was still very languid but was taking food and drinks well. Convalescence proceeded uneventfully, and he was allowed up in a chair on June 17—i.e., 22 days after operation. On July 4 he was sent on sick leave for 28 days.

On his return to hospital on Aug. 1 he was almost unrecognisable—he looked so fat and well. He had gained $1^1/_2$ stone and could now take a good mixed diet without discomfort, provided that the meals were small.

The patient was last seen in November, 1947, when he said he had remained in good health and was enjoying a mixed diet. He could eat fish and various meats and vegetables, but pain and flatulence were caused by the following articles of diet: tinned food (such as sardines, herrings, and baked beans); fish and meat pastes; sausages, pork, and any meat made up with seasoning, as in vienna steaks; curries and meat soups; cauliflower, brussels sprouts, and onions; and certain fried foods.

Figs. 1 and 2 show the changes in the blood-urea, albuminuria, and urine chlorides during the postoperative period.

The findings at operation made it clear that the emaciation, dehydration and thirst were explained by pyloric stenosis. The generalised abdominal rigidity, fits, cramps, and loss of consciousness were associated with the alkalosis and the consequent tetany.

ADDITIONAL INFORMATION

The following details of the preoperative state and the history of prolonged gastric symptoms were only obtained from the patient and his wife in the period of convalescence. This information had been withheld on admission for the reasons already stated above.

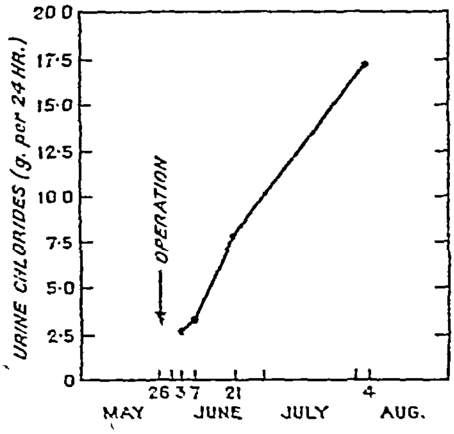

Fig. 2—Chart showing rise in excretion of chlorides in urine.

In 1937 the first symptoms of "indigestion" were experienced—an epigastric pain relieved by MacLean's powder in a few days. Patient remained well until May, 1940, when he went to bed for five days because of stomach pain and thereafter returned to duty and was on a diet for four weeks with complete relief.

In August, 1940, symptoms recurred, and patient was under treatment intermittently from this time until his operation in May, 1942.

In July, 1941, he began to vomit, and in August, 1941, he was usually bringing up a pint or two of vomit about every third day, with considerable relief to the epigastric pain, which was now very frequent and usually occurring about $1^1/_2$ hours after food. Some relief was obtained with magnesium trisilicate.

In November, 1941, the vomiting was more severe and, as the months passed, became a more and more prominent feature of the illness. At this time the patient was taking sodium bicarbonate to relieve his symptoms. Later he used MacLean's powder in doses of 1 or 2 drachms each day and obtained some relief.

Patient took a very intelligent interest in his condition and began to doubt if he could much longer conceal his true state of health. He made a daily record of vomiting.

1941						
November 11–30	..	Vomited	10	out of	10	days
December	.. ..	,,	17	,,	31	,,
1942						
January	.. ..	,,	21	,,	31	,,
February	.. ..	,,	21	,,	28	,,
March ..	.. ..	,,	21	,,	31	,,
April ..	.. ..	,,	23	,,	30	,,

In April, 1942, patient was vomiting two or three times a day on most days and often in the night too. It is not surprising that he complained of cramps in April, the first occasion when this symptom was present. The cramps appeared in the calves, feet, and toes. They never occurred in the day but only in bed and often wakened him from sleep. In May, 1942, the vomiting was even more severe and after every meal and consisted of several pints of acid fluid mingled with semi-digested foodstuffs.

Cramps were now experienced in the hands as well as in the feet. Patient was, at this stage, much emaciated and dyspnœic on the slightest exertion.

On May 17, 1942, he made this note in his diary: "Vomiting occurs after breakfast and after lunch, but in the afternoon and evening and during the night nothing at all can be kept down but is rejected within half an hour of ingestion." Thirst was now a severe symptom.

During the week preceding admission patient noted that the amount of urine was getting very small, and he learnt from his wife afterwards that from 9 A.M. on May 23 to his admission on May 24 he did not pass any urine at all. He was admitted in a deplorable state, a mere skeleton, emaciated and dehydrated so that bony prominences looked like perforating the thin parchment-like skin.

COMMENTS

The semiconsciousness associated with a seizure and albuminuria raised the question of uræmia. On the other hand, the generalised board-like rigidity (which resulted from the muscular spasm of tetany) and diminished liver dullness (probably from dilatation of the stomach) gave rise to a preoperative diagnosis of generalised *peritonitis*.

The reason for secrecy and avoidance of treatment lay in the fact that the patient expected to lose his job if he went sick with "gastric trouble" again. He held out until alkalosis, tetany, and coma overcame him.

After operation a fractional test-meal showed the presence of hydrochloric acid in the stomach, and it is evident that the alkalotic tetany resulted both from the loss of hydrochloric acid and the ingestion of large amounts of alkaline stomach powders (see above). Under war-time conditions it was unfortunately impossible to make full biochemical investigations before operation.

SUMMARY

A case of advanced pyloric stenosis is described in which persistent and severe vomiting brought about alkalosis, tetany, and coma. The patient completely recovered after operation.

I wish to thank Surgeon Vice-Admiral H. C. Colson, C.B., C.B.E., D.P.H., Medical Director-General, Royal Navy, for permission to publish this case.

Reviews of Books

Lectures on the Liver and its Diseases

H. P. HIMSWORTH, M.D., F.R.C.P., professor of medicine in the University of London, and director of the medical unit, University College Hospital, London. Oxford: Blackwell Scientific Publications. 1948. Pp. 204. *18s. 6d.*

Professor Himsworth begins by reviewing the types of liver damage produced in animals by dietary means, by poisons, and by interference with the circulation. Of particular interest is the importance he attaches to local vascular factors in determining the distribution and extent of hepatic lesions. His cardinal point is that the pathological sequence of events depends not so much on the nature of the causative agent as on the anatomical form of the initial injury.

This concept he then applies to the classification and interpretation of human liver disease. Here the question arises whether dietary deficiency can cause liver injury in man as it does in animals. Professor Himsworth believes that it can: he suggests that the fatty liver of alcoholism and the hepatic necroses of pregnancy are both essentially effects of malnutrition, and he cites the observations of Trowell, the Gillmans, and others in the tropics to show that in malnourished populations a human parallel can be found to each of the types of liver injury that have been produced experimentally by diet. On such evidence he proposes a broad ætiological classification of human liver disease into two groups—toxipathic and trophopathic hepatitis. The distinction is systematic rather than practical, and may be premature, but it will have served its purpose if it draws the attention of the general reader to a possibly unfamiliar field. The investigations in Africa undoubtedly have a significance far beyond the sphere of purely tropical disease, and Professor Himsworth was one of the first to recognise this.

The last chapters are concerned with the symptomatology of hepatic failure, and the clinical course of the syndromes whose pathology has been described. This is more familiar ground, but most readers will find something to learn.

The book has many omissions; but it is a series of lectures, not a textbook. In these days it takes courage, in a work of this kind, to dispense with a recapitulation of physiology and biochemistry, and to devote only a single page to laboratory tests and aids. Such a treatment inevitably produces an effect of onesidedness, but it has the advantage of throwing into clear relief the author's own line of thought. At times too little attention seems to have been given to the work of others—for instance of Sebrell and his colleagues, and of Bollman. In places, too, the argument is finely drawn and over-ingenious. But Professor Himsworth does not claim to do more than put forward tentative hypotheses, which, he says, must be submitted to repeated and rigorous criticism. Taken in this sober spirit, the book is a valuable contribution to medical science. It is also, in a sense, a work of art, for it shows an unusual blending and harmony of the intellectual approach of the bedside with that of the laboratory.

Modern Trends in Ophthalmology

Vol. II. Editor: ARNOLD SORSBY. London: Butterworth. *1948. Pp. 600. 63s.*

IN order to give a true picture of the direction in which ophthalmologists are working, the editor of this popular book, now in its second edition, has rightly cast his net wide: of the 44 contributors 27 are from outside the British Isles, and he has even succeeded in enlisting the coöperation of Moscow. Among so many contributors of international repute it is hard to pick and choose, but it is pleasant to see recognition of the work of Ragnar Granit on the electrophysiology of the retina, and of Stina Bjork on hypertensive retinopathy, both contributions coming from Sweden. A summary of his work on gonioscopy is given by Troncosa of Columbia University, and this is of special interest now that the use of the gonioscope has come to be recognised as an essential diagnostic procedure in glaucoma. Arruga, one of the world's authorities on retinal detachment, gives his latest views on this subject, and Waardenburg contributes a chapter on inheritance in ophthalmology. Professor Sorsby himself writes on several issues—X-ray measurement of the diameters of the living eye, virus infections, penicillin, and the use of amniotic membrane in eye burns. The book is outstanding.

Sulfonamides and Allied Compounds

ELMORE H. NORTHEY, PH.D., administrative director, Stamford Research Laboratories, American Cyanamid Co., Connecticut. New York: Reinhold Publishing Corporation; London: *J. & A. Churchill. 1948. Pp. 660. 75s.*

THIS is one of the Chemical Monographs in the well-known series produced under the auspices of the American Chemical Society. It attempts to cover the chemical side of the sulphonamide group and also to provide pharmacologists and clinicians with data concerning chemotherapeutic activity, as well as references to other important information on properties. Some idea of its scope can be gauged from the fact that it contains 2608 references, of which 599 are to chemical literature.

The chemical aspect, indeed, occupies most of the book. After a succinct and accurate historical introduction, in which justice is done to British and French workers, the pharmacology and toxicology of the sulphonamides are well described, and there are interesting accounts of the theories of the mechanism of action and of drug-resistance. The clinical section, occupying some 60 pages, is largely an uncritical review of published papers; but, as Dr. Northey says, "*it is necessary that* those who are engaged in the long experimental approach of launching a new drug have some knowledge of the criteria on which the fruits of their labours will be judged." He has provided the most complete existing survey of the literature of the sulphonamide drugs, and has enabled any chemist who is ambitious to synthesise a new sulphonamide to see at a glance what ground has already been covered.

THE LANCET

LONDON: SATURDAY, AUGUST 7, 1948

A Compromise?

CONSULTANTS and specialists must have a central dy to represent their interests in the National alth Service, and three proposals have been made this end.[1] The first is that a new and independent ganisation should be formed by direct election of presentatives to regional committees which in turn ould elect a central council with its own secretariat. ch an organisation would have to start from scratch, d there is at present no sign of the determination eded to overcome this handicap. The second and ore realistic proposal is that the representation of ecialists, as of general practitioners, should be trusted to the British Medical Association. But this o has its difficulties. Possessing their own ancient stitutions, specialists have not in general been in e habit of looking to the B.M.A. for guidance, and y no means all of them share its confidence in the adership it offers. They note that, though they are ow accorded "autonomy" within the association, he presentation of their views may ultimately depend n the approval of a council on which the general ractitioner, by right of numbers, will always have he chief voice. One of the weaknesses of the B.M.A. as been that its representatives derive their authority rom local meetings which are often poorly attended; and in this case a further distorting factor will be ntroduced if a large proportion of the heads to be ounted are those of part-time specialists. The ilution of specialist labour which the National Health Service makes necessary should not be allowed to lead to a lowering of standards, of which the colleges have long been the guardians: and there is a real risk that it might do so. With all this in mind, many feel that, despite improvements, the B.M.A.'s consultants' and specialists' committee remains constitutionally unsuited to perform some of the functions it seeks to assume. Its lack of professional weight serves indeed to display certain contrasting advantages in the third proposal, under which the affairs of specialists would be entrusted to a central council of tripartite composition, drawing its representatives partly from the colleges, partly from the specialist associations, and partly from the regions. Ideally arranged, this would give the specialist three forms of representation—first through his college, secondly through his technical association, and thirdly through his region (perhaps on a postal vote). The resultant body would command the more respect, both inside and outside the profession, in that it could speak with these three kinds of authority. The serious fault of the pilot model set up on June 14 was that the confusing situation prevented full representation from the regions

As will be seen from the announcement on p 239, a compromise is now suggested by which a comparatively small committee "to advise the Minister of Health on all matters concerning consultants and specialists" would be established jointly by the Royal Colleges, the Royal Scottish Corporations, and the British Medical Association. The B.M.A.'s committee, and the colleges' committee, would both remain in existence "to brief the joint committee," and the joint committee would allocate, as soon as practicable, fields in which its constituent bodies were "free to take independent action and to deal with governmental bodies direct." Actually, the different aspects of consultant and specialist work are so closely connected that it is not easy to see how the functions of the two "briefing" committees could be separated without giving one or other the lion's share But if under Sir LIONEL WHITBY's chairmanship a reasonable and fair division of labour can somehow be achieved, the compromise will be welcome. We have to ensure equally that the best traditions of consultant practice are preserved and that every specialist is represented and helped in the manner he would prefer.

Food and the Liver

IN animals experimental deficient diets have produced two distinct types of hepatic lesion—namely, fatty infiltration and massive necrosis.[1,2] Fatty infiltration, if sufficiently severe and long-continued, gradually develops into a diffuse fibrosis resembling Laennec's cirrhosis: massive necrosis, if not quickly fatal, tends to heal with nodular hyperplasia and scarring.[2]

There is fairly general agreement that the nutritional defect responsible for the fatty infiltration is lack of choline, or of substances containing labile methyl groups which the body can utilise for choline synthesis: but the mechanism by which fatty infiltration leads to cirrhosis remains more doubtful. There is, however, some evidence that the integrity of the liver cells, as of other cells, depends on a balance between their metabolic demand and their nutritional supply. Thus MCIVER and WINTER[3] have shown that a degree of anoxia which is well withstood by normal rats will produce centrilobular zonal necrosis in rats whose metabolic rate has been raised by injections of thyroxine. Similarly, a dose of thyroxine which by itself causes no demonstrable hepatic injury will greatly enhance the toxicity of carbon tetrachloride,[4] a drug whose hepatotoxic action has lately been ascribed to the reduction in the intralobular circulation that follows its administration.[5] A similar impairment of the intralobular circulation is seen in fatty livers, as a result of sinusoidal compression by the fat-laden liver cells,[6,7] and HIMSWORTH and GLYNN[2] suggest that this leads to malnourishment of the centrilobular cells, which therefore undergo atrophy followed by fibrous replacement and consequent cirrhosis. Hypothyroidism, induced either surgically or chemically, lowers the metabolic activity of the liver cells, thereby enabling them to survive an

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[1] See *Lancet*, 1948, i, 991.

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1. Györgi, P., Goldblatt, H. *J. exp. Med.* 1939, 70, 185; *Ibid*, 1942, 75, 355.
2. Himsworth, H. P., Glynn, L. E. *Clin. Sci.* 1944, 5, 93.
3. McIver, M. A., Winter, M. A. *Arch. Surg., Chicago*, 1943, 46, 171.
4. McIver, M. A. *Proc. Soc. exp. Biol., N.Y.* 1940, 45, 201.
5. Glynn, L. E., Himsworth, H. P. *Clin. Sci.* 1947, 6, 235.
6. Himsworth, H. P. Lectures on the Liver and its Diseases. Oxford, 1948. (Reviewed on p. 220.)
7. Glynn, L. E. *Nutr. Abstr. Rev.* 1947, 16, 751.

otherwise lethal degree of circulatory insufficiency; and, as HANDLER[8] has shown, hypothyroidism gives protection against fatty cirrhosis even though it increases the amount of fat in the liver.

Opinion differs more widely about massive necrosis. By means of diets deficient in thio-amino-acids some workers produce this condition consistently, others only occasionally, and others (using ostensibly the same technique) not at all. Variations in strain susceptibility, in the nature of the yeast and vitamin supplements, in the intestinal flora, and in climatic conditions are relevant factors, summarised by RAO[9] and awaiting elucidation. The irregularity of the results obtained in different experiments, and particularly in different laboratories, strongly suggests that an infective agent is also playing an important part; but neither GYÖRGI and GOLDBLATT[1] nor HIMSWORTH and GLYNN[2] could find any evidence of such an agent, either by culture, animal passage, or epidemiological studies. One notable difference, however, between diets which have caused necrosis and similar diets which have not done so is the presence in the latter of a supplement of vitamin E. Though SCHWARZ[10] previously called attention to the value of tocopherol as a protective agent against hepatic injury, GYÖRGI[11] was the first to establish that massive necrosis cannot be produced dietetically in rats unless the diet is deficient in vitamin E. He thinks that "as a further nutritional factor the quality of dietary fat should probably be taken into consideration."

In man, as in animals, it has been easier to demonstrate a relation between diet and fatty cirrhosis than between diet and massive necrosis. The work of TROWELL[12] in Uganda, the GILLMANS[13] in South Africa, and WATERLOW[14] in the West Indies, and of many others, has drawn attention to the remarkably high incidence of hepatic disease in badly nourished people in widely separate parts of the world; and, though parasitic infections are partly responsible for this damage to the liver, the response to nutritional therapy leaves little doubt that nutritional deficiency is usually the major factor. Further suggestive evidence to this effect is given in our present issue by Professor FERNANDO and his colleagues in Ceylon, who recognise two types of cirrhosis—a "toxic cirrhosis" following acute or subacute massive necrosis, and a fine diffuse fibrosis, or Laennec's cirrhosis, following fatty infiltration. A significantly high proportion of all their cirrhosis cases had subsisted for a year or more on a diet grossly deficient in protein, especially animal protein; but their data do not make it possible to relate the two types of cirrhosis to different types of diet. Since in nature a diet deficient in lipotropic factors is usually deficient in thio-amino-acids, and vice versa, it seems probable that in these patients the onset of massive necrosis is determined not by a specific dietary deficiency but by some extraneous factor such as an attack of infective hepatitis. It is clear, too, that in some malnourished populations, as in some animal experiments, the incidence of hepatic lesions is surprisingly low.[15]

Nevertheless, it would be a grave error to conclude from this that nutritional factors are of little moment In massive hepatic necrosis multiple nutritional factors are concerned, of which at least two have already been defined, and there can be little doubt that relative as well as absolute deficiency is of great importance. HIMSWORTH and GLYNN,[2] for example, found that, whereas hepatic necrosis developed when the total daily intake of casein per rat fell below 500 mg., it was not seen when the intake was further reduced below 200 mg. Similarly, a small supplement of milk given to rats maintained on a diet of mealy pap precipitates their death with extensive liver lesions[16]—a finding possibly connected with the growth-stimulating effects of small protein supplements, and the consequent diversion to other tissues of factors essential for normal liver metabolism. Though we cannot yet account for these apparently anomalous findings, it is already certain that the integrity of the liver depends very largely on nutrition.

Population Pressures

THE threat of war and starvation in this tightly packed island led many speakers in a recent House of Lords debate to urge the imperial dispersion of our population. In so far as it would mean selective emigration of the young and the fit, this policy has obvious dangers, not only for this country but also for the whole British Commonwealth, whose strength partly depends on our maintaining in Britain a well-balanced working force not too much encumbered by aged dependants. To this end we must achieve at least a balance between the death-rate and the number of children surviving to adulthood. Here the measure of success is the net reproduction-rate, which summarises the trend of movement as in a kaleidoscopic sequence: a net reproduction-rate of 1·00 means that at prevailing birth and death rates, 100 women will be replaced by 100 of their daughters surviving to child-bearing age in the next generation Only from such data can any long-term demographic predictions be made; but we need no refined techniques to know the extent of the short-term problem of population structure. The numbers of new young entrants to industry available in 1950 has been already decided by their births in 1934; except by migration, their numbers are unchangeable. The figures show that the age pyramid has in fact already become top-heavy, and it is evident that any precipitate removal of the young might be disastrous. Our position is shared, of course, by many of the countries encompassed by Western Union. Two reports from the World Health Organisation,[17] which give details of the shifting balance of births and deaths in many countries, show that France's situation, for example, is even more critical than ours, since she has already reached the stage of decline in population. On the other hand the trend of her net reproduction-rate, which reached a nadir of 0·77 in 1941, has latterly been reversed, and there is hope that a balance

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8. Handler, P. *J. biol. Chem.* 1948, 173, 295.
9. Rao, M. V. R. *Nature, Lond.* 1948, 161, 446.
10. Schwarz, K. *Hoppe-Seyl. Z.* 1944, 281, 101 and 109.
11. Györgi, P. In Transactions of Josiah Macy, jr., Foundation Conference on Liver Injury. New York, 1947.
12. Trowell, H. C., Muwazi, E. M. K. *Arch. Dis. Child.* 1945, 20, 110.
13. Gillman, J., Gillman, T. *Arch. Path.* 1945, 40, 239.
14. Waterlow, J. C. *Proc. R. Soc. Med.* 1947, 40, 347.
15. Sherlock, S. *Nature, Lond.* 1948, 161, 604.
16. Gillman, J., Gillman, T., Mandelstam, J., Gilbert, C. *Bri J. exp. Path.* 1945, 26, 326.
17. W.H.O. Epidemiological and Vital Statistics Report, 1947, vol. 1; no. 3 (August); *Ibid*, no. 5 (October).

struck between deaths and replacements will put France into the low stationary phase, where, as in the United States, most of Western Europe, and the British Dominions, low birth-rates are matched by low death-rates to keep the population stable in numbers.

Preoccupation with the immediate difficulties of replacement in Western Europe should not blind us to the broader picture of the movements and pressures of population in the world at large. BLACKER[18] describes how, in the last thousand years, the small European centre outstripped the rest of the world in technical achievement. Exploration and colonisation spread the European stock over the Americas, Africa, and the East: indeed in North America what WOODROW WILSON called the "swarming of the English" resulted in an eleven-fold increase in the population. A high birth-rate combined with falling death-rates to produce in both colonisers and subject peoples the early expansive phase of population growth. The checks and balances of epidemic and famine, operating as in modern China with its equally high birth and death rates and stable population, were obliterated by advances in agricultural and sanitary science. These effects persist among the peoples of India and Indonesia; but a new demographic stage appeared in the centres from which these colonising influences came. Industrialisation and urbanisation in the "advanced" countries of Western Europe were accompanied by closing of the gap between birth and death rates, and even, in the middle 1930s, by the stage of declining numbers. Areas of low fertility formed and grew steadily wider until, just before the second world war, the trend altered and an increase in the birth-rate set in. The late war certainly did not arrest this reversal, and most Western European countries now have higher hopes of demographic stability. In Eastern Europe, particularly in the Soviet Union and in Japan, there exists a different state—one of late expansion, where the death-rates are declining more quickly than the birth-rates and population increase continues. In the Mohammedan world, breeding to capacity continues but the high death-rates hamper numerical increase. Vital statistics in the Middle East, as in India and Indonesia, are rather unreliable; in India, for example, the village chowkidar is notoriously selective in recording births and deaths. Yet it seems clear that among the mixed blessings derived from a contact with Western civilisation has been a decrease in death-rates and a resultant expansion of the already teeming millions of South-East Asia.

These facts raise questions of material and moral importance. The pressure of population and the demand for *Lebensraum* has long been held to be a potential cause of war; and in war the position of the relatively infertile Western European appendage to the great land mass of Eurasia is unenviable. Again, the new food morality preached by SIR JOHN BOYD ORR, whereby each country receives a slice of world's food cake in proportion to its human needs rather than to its economic purchasing-power, may have serious repercussions in this country. Even our present dietetic standards are princely compared with the bare subsistence of the Indian peasant, and any strict egalitarianism would, BLACKER suggests "keep our wives and perhaps our daughters standing in queues for many years to come." But, as ORR would no doubt point out, we have defied Malthusian prophecies thus far, and the science of food production and distribution is still in its infancy. Beyond a certain point too, demography ceases to be an exact science. Long-term population forecasts which (said STOWMAN) "are made with impunity only because no-one reads them ten years after they are published," are often little better than educated guesses. All turns on the emancipation and education of women in countries where over-population may be the prelude to war. Through them, the contraceptive limitation of families may balance the death-diminishing powers of sanitary progress, and relieve both their own arduous lives and the pressing demands of too many hungry mouths.

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[18] Blacker, C P. *Eugen. Rev.* 1947, 39, 88.

Annotations

THE FIRST MONTH

DOCTORS and patients have now had a whole month in which to sample the advantages, disadvantages, and shortcomings of the National Health Service. Most practitioners would agree, we believe, that the month has brought fewer changes than they feared. It is true that, for many of them, surgeries have been unusually heavy: but some of the extra work will not have to be repeated. Patients uncertain of their rights, or how to obtain them, have come to ask questions, or to hand in forms. Others have waited for July 5 before presenting themselves to have their eyes tested, or their minor operations arranged. Private patients who formerly had repeat prescriptions filled by pharmacists now come to have each prescription written on to the official form: but in course of time this additional labour will be reducible by prescribing, in some of the cases, medicine of a type or quantity that will demand less frequent repetition.

Administratively the initial stages proceed steadily and with surprisingly few hitches. The final count of doctors joining the service will not be known until allowance can be made for those whose names now appear on the lists of more than one executive council, and for those who have joined the service to secure their right to compensation, but who for reasons of age or infirmity, or because they now intend to specialise, will soon be retiring from general practice. Even now, however, it is safe to say that enough doctors have joined to provide in all areas an adequate service. The patients have not been backward in completing their application forms, and the number of patients on doctors' lists is already said to approach 90% of the population. The cards have come in quickly and many an executive council office has found it hard to keep pace with its inordinately heavy daily intake. Some delay is inevitable while patients' cards are sorted, counted, and recorded, and one cannot expect the new record cards to arrive immediately after dispatch of the application forms. What is less excusable is that stocks of prescription and certificate forms received by executive councils before the appointed day have sometimes been insufficient to meet the practitioners' needs, and that schemes are announced for opting out of superannuation, and for claiming compensation, before executive councils possess the memoranda and application forms that will enable practitioners to make their claims.

The rapid enrolment of so high a proportion of the public has only too quickly revealed the uneven distribution of doctors. Reports from some under-doctored otherwise lethal degree of circulatory insufficiency; and, as HANDLER[8] has shown, hypothyroidism gives protection against fatty cirrhosis even though it increases the amount of fat in the liver.

Opinion differs more widely about massive necrosis. By means of diets deficient in thio-amino-acids some workers produce this condition consistently, others only occasionally, and others (using ostensibly the same-technique) not at all. Variations in strain susceptibility, in the nature of the yeast and vitamin supplements, in the intestinal flora, and in climatic conditions are relevant factors, summarised by RAO[9] and awaiting elucidation. The irregularity of the results obtained in different experiments, and particularly in different laboratories, strongly suggests that an infective agent is also playing an important part; but neither GYÖRGI and GOLDBLATT[1] nor HIMSWORTH and GLYNN[2] could find any evidence of such an agent, either by culture, animal passage, or epidemiological studies. One notable difference, however, between diets which have caused necrosis and similar diets which have not done so is the presence in the latter of a supplement of vitamin E. Though SCHWARZ[10] previously called attention to the value of tocopherol as a protective agent against hepatic injury, GYÖRGI[11] was the first to establish that massive necrosis cannot be produced dietetically in rats unless the diet is deficient in vitamin E. He thinks that "as a further nutritional factor the quality of dietary fat should probably be taken into consideration."

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Nevertheless, it would be a grave error to conclude from this that nutritional factors are of little moment. In massive hepatic necrosis multiple nutritional factors are concerned, of which at least two have already been defined, and there can be little doubt that relative as well as absolute deficiency is of great importance. HIMSWORTH and GLYNN,[2] for example, found that, whereas hepatic necrosis developed when the total daily intake of casein per rat fell below 500 mg., it was not seen when the intake was further reduced below 200 mg. Similarly, a small supplement of milk given to rats maintained on a diet of mealy pap precipitates their death with extensive liver lesions[16]—a finding possibly connected with the growth-stimulating effects of small protein supplements, and the consequent diversion to other tissues of factors essential for normal liver metabolism. Though we cannot yet account for these apparently anomalous findings, it is already certain that the integrity of the liver depends very largely on nutrition.

Population Pressures

THE threat of war and starvation in this tightly packed island led many speakers in a recent House of Lords debate to urge the imperial dispersion of our population. In so far as it would mean selective emigration of the young and the fit, this policy has obvious dangers, not only for this country but also for the whole British Commonwealth, whose strength partly depends on our maintaining in Britain a well-balanced working-force not too much encumbered by aged dependants. To this end we must achieve at least a balance between the death-rate and the number of children surviving to adulthood. Here the measure of success is the net reproduction-rate, which summarises the trend of movement as in a kaleidoscopic sequence: a net reproduction-rate of 1·00 means that at prevailing birth and death rates, 100 women will be replaced by 100 of their daughters surviving to child-bearing age in the next generation. Only from such data can any long-term demographic predictions be made; but we need no refined techniques to know the extent of the short-term problem of population structure. The numbers of new young entrants to industry available in 1950 has been already decided by their births in 1934; except by migration, their numbers are unchangeable. The figures show that the age pyramid has in fact already become top-heavy, and it is evident that any precipitate removal of the young might be disastrous. Our position is shared, of course, by many of the countries encompassed by Western Union. Two reports from the World Health Organisation,[17] which give details of the shifting balance of births and deaths in many countries, show that France's situation, for example, is even more critical than ours, since she has already reached the stage of decline in population. On the other hand the trend of her net reproduction-rate, which reached a nadir of 0·77 in 1941, has latterly been reversed, and there is hope that a balance

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9. Rao, M. V. R. *Nature, Lond.* 1948, **161**, 416.
10. Schwarz, K. *Hoppe-Seyl. Z.* 1944, **281**, 101 and 109.
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13. Gillman, J., Gillman, T. *Arch. Path.* 1945, **40**, 239.
14. Waterlow, J. C. *Proc. R. Soc. Med.* 1947, **40**, 347.
15. Sherlock, S. *Nature, Lond.* 1948, **161**, 604.
16. Gillman, J., Gillman, T., Mandelstam, J., Gilbert, C. *Bri J. exp. Path.* 1945, **26**, 326.
17. W.H.O. Epidemiological and Vital Statistics Report, 1947, vol. 1; no. 3 (August); *Ibid*, no. 5 (October).

other countries—Greece, Yugoslavia, Italy, and Poland—and he reminds his readers of the Allied agreement that Germany should not be better fed than the Allied nations. Significantly, he adds that there is little opportunity to read the truth about the present state of nutrition in Germany, and suggests that this is kept out of the papers in order to prevent public alarm.

In this light it seems doubly unfortunate that last October's report by the Combined U.S.-British-French Nutrition Committee has not been made public. In reply to a question in the House of Commons, Mr. C. P. Mayhew,[3] speaking for the Foreign Secretary, quoted this report as saying that nutrition of the urban population in the Western Zones had improved in the previous six months, that famine œdema was very rare, and that the weight of adults had not declined. Why were the Germans not told this? Similarly, the recent official report on the incidence of tuberculosis in the British Zone should receive the widest publicity. We trust that there will be no concealment of the findings of the bipartite nutrition survey committee which in April toured the British and American Zones. As Dr. Wolff-Eisner's conclusion clearly shows, suppression of the facts makes the people think that there is something to hide.

THE PAY OF A STUDENT NURSE

On July 5, when nurses began to contribute some £18 a year to National Insurance, the payment received by a first-year student nurse fell from £55 a year to £37 4*s*. 8*d*., and hence to the monthly sum of just over £3. Those in the later years of training were a few shillings a month better off. A group of six or seven hundred nurses, drawn from St. Mary's Hospital, Plaistow, Whipps Cross Hospital, the Prince of Wales's Hospital, Tottenham, and other institutions threatened to resign on Aug. 1 unless their claims for higher pay were officially considered. To help to allay their anxiety the Ministry of Health announced that a final recommendation of the Rushcliffe Committee—that student nurses should have an additional £15 a year—had been accepted and was to come into force forthwith; but this ill-timed announcement of an already agreed plan was mistaken for a niggardly concession, and has merely roused the students further. For the rise still leaves them poorer by some £3 a year, though they will be now entitled to benefits which they could not previously command. On July 27, at a meeting convened by the Confederation of Health Service Employees, at Canning Town, student nurses called upon the Functional Council to proceed with negotiations for a £5 a week wage for them; according to the *Times* of July 28 the meeting was attended by nurses from more than a dozen London hospitals. This seems to indicate a growing dissatisfaction, since at the original meeting, on July 22, the general feeling is reported to have been in favour of an increase of £50 a year.

It is stimulating to find nurses—who usually seem too busy or too tired for polemics—taking an active line for once. Many will sympathise with their protest, especially since—in the best traditions of their profession—they are prepared to stay at work for a time after Aug. 1 in order to give the hospitals a chance of getting new staff. Over a year ago a correspondent[4] in our columns outlined the following budget for a student nurse receiving £55 a year: £20 for essential clothing other than uniform (including underwear, stockings, shoes and shoe repairs, as well as outdoor clothes); £25 for expenses when off duty, including fares and modest entertainments; and £5–£10 for insurance and superannuation (as the cost ran then); leaving £5 for petty items such as cigarettes, tooth-paste, small repairs, Christmas presents, hairdressing, and textbooks. This narrow budget has become even more stringent in the months which have passed since then: for example, clothing cannot be covered within the prescribed limit, especially as some items, such as shoes and stockings, are the nurse's contribution to her uniform and suffer heavy wear; and shoes are now particularly costly. Even a light smoker pays heavily for the privilege; fares have risen; and almost all small expenses have increased. These items are hardly offset by the saving of £5–£10 for insurance and superannuation—now covered, of course, by the National Insurance contribution of £18. In short, to meet all their expenses student nurses must have some help from home; and many of them inevitably come from homes where the parents feel that the grown child should be a contributor, not an expense.

Our contributor thought, in February, 1947, that there was a good case for giving all student nurses a maintenance grant at a flat rate of £100 a year throughout training. At that time, however, the long-standing objection could be made that the more the hospitals paid their student nurses the more they would exact in service and the less they would regard them as students. Now, the position is changed. The contract of the nurse is no longer with the hospital but with the regional hospital board; and though her pay comes to her through the hospital management committee, it actually derives from the regional board by way of the block grant. The hospitals are thus no longer in a position to feel that they "employ" their nurses; while the nursing subcommittees of the regional boards will doubtless take a responsible part in raising and maintaining student status. A fresh study of the pay of student nurses is urgently needed; but it is specially unfortunate that their claims have been so neglected and mismanaged that they have been driven to forcible protest. An emergency meeting of the Whitley Councils' Nurses' and Midwives' Functional Council has been called for Aug. 20 to consider the position, but a reassuring interim measure of some kind would be welcome.

THE CEREBELLUM RECONSIDERED

UNTIL lately the cerebellum has been the most baffling part of the central nervous system. Though its removal produces grave motor incapacity it is largely unresponsive to electrical stimulation; and it is only in the past year that its function has been shown to be as precisely localised as that of the motor cortex.

When Dr. John Fulton, professor of physiology at Yale, spoke about the cerebellum at the National Hospital, Queen Square, on June 11, he laid stress on the relation between the mode of stimulation in the central nervous system and the response evoked. Wyss and Obrador found that there was a difference in the optimal duration of stimulation of the motor area of the cerebral cortex for proximal and distal muscles. Indeed, this optimal duration varied for contiguous muscles, and not only the duration of stimulus but its shape and frequency will modify the resulting cortical activity. This is true for area 4 and area 6, and the mode of stimulation seems to be even more important for those parts of the cortex from which autonomic activity can be evoked than for those representing voluntary movements. Stimulation of an area anterior to the motor cortex from which eye movements can be evoked will cause conjugate deviation of the eyes to the same side or to the opposite when the frequency of stimulation is changed. Then there is an area of the cerebral cortex, in the same region as that which induces conjugate deviation of the eyes, where stimulation results in the motor activity of the "waking state" and the "sleeping state." Thus, two opposite forms of activity can be induced at will by applying stimuli of different frequency to the same area. Professor Fulton had the experience of invoking the

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3. *Lancet*, 1948, i, 502.
4. *Lancet*, 1947, i, 190.

areas tell of doctors with lists already more than saturated, while from others come reports of groups of doctors faced with unexpectedly small lists, and shrinking incomes, spontaneously approaching the newly formed Medical Practices Committee with requests that their particular area shall be declared over-doctored, and closed to the entry of further practitioners. Evidently the committee's purpose, as well as its personnel, has been tacitly accepted, and it has quietly embarked on its tasks. It has delegated considerable power to the executive councils over such matters as the sanctioning of the employment of assistants, and the admission of new principals, only asking to be specifically consulted in a short schedule of cases where permission might well need to be withheld.

The local obstetric committees, too, have begun work in most areas. For the most part they are interpreting their mandate leniently, and refusing permission to few doctors who have signified their willingness to accept midwifery responsibilities. Allocation committees have so far had very few cases to deal with—surprisingly few when one considers the very large numbers of patients (over 18 million) who have sought to be freshly included in doctors' lists in these few short weeks. The fact that these cases have been so few goes far to show that the complaints of doctors refusing for all manner of reasons to accept certain patients, to which so much prominence has been given in the press and in Parliament, cannot concern more than a small minority of doctors.

Patients have been confused. In particular, the simultaneous launching of a National Health Service, participation in which is optional, and a National Insurance scheme, compulsory under penalty for most families, has led to every permutation of misunderstanding. But it does now seem that the relatively high rate of weekly insurance contribution which has become payable has been the determining factor which has decided so many to enter so quickly. Conversely, a remarkably high proportion of elderly people have said that, as no direct weekly contribution is being asked of them, they feel it unfair to avail themselves of the benefits to which they are entitled. It is probable that many who so far have not signed cards will do so if in the ensuing months they need medical care. The fact that medicines cannot be supplied at the expense of the service to any but enrolled patients has brought many, and will continue to bring others, into the service. It will be surprising if the estimated 98% of acceptances in the first two years is not reached long before this term is up.

July began with very unseasonable weather which did nothing to improve the health or the temper of the British public. The incidence of infectious illnesses, too, seemed somehow to linger on this year, and the load of measles, mumps, and chickenpox remained greater than usual. Nevertheless, we have got through the first month without undue disturbance, and the months that follow should allow the new service to get well into its stride before it has to bear the burdens of winter.

A SCRUTINY OF MENTAL HEALTH PROBLEMS

AGGRESSION, world citizenship, and guilt are the themes of the three international conferences embodied in the International Congress on *Mental Health*, to be held from Aug. 11 to 21 at the Central Hall, Westminster. For this congress, organised by the National Association for Mental Health at the request of the International Committees on Child Psychiatry and Mental Hygiene, and the International Federation for Medical Psychotherapy, some 2000 delegates, drawn from nearly 50 countries, have registered. About 900 delegates are coming from abroad, and only Soviet Russia, among the great powers, has failed to send any.

An unusual plan of preparation has been followed: for some months past nearly 300 groups of people, including psychiatrists, doctors, psychologists, social workers, clergy, lawyers, and others have been at work in more than 20 countries examining questions which are to be considered at the congress. Reports of their investigations have been sent to the organising committee in London, where they have been edited for consideration by an international preparatory commission. This commission, composed of 30 leading people in the mental health field from various countries, will meet at Roffey Park, Sussex, for a fortnight before the opening of the congress, to read the reports and decide which aspects of them should be considered further at the congress.

The main purpose of the three conferences is to study group relations in the community, in industry, and between nations. It is, perhaps, from such studies that we shall at last achieve the ability to live at peace in a small and crowded world.

GERMANY'S FOOD

How much food are the Germans eating today? This question has had the attention of many trained observers, but their answers are no more than conjectures since the scale of rations bears little relation to the amount of food consumed. Some months ago Dr. Aschoff,[1] a German nutritionist, told us that between last November and February the rations might yield as little as 866–1135 calories a day. But these figures take no account of unrationed food or of rationed foods from the black market, which in Germany is many times more active than any we have known in Britain. By some this black market has been actually defended; for the time being, it is argued, there is not enough productive work for the population, and the two or three days spent each week in foraging for supplies averts the trouble usually said to come from idle hands and brains. Nevertheless, there are ample reasons for not regarding such a situation as satisfactory. Any black market is acutely competitive: without money to buy or goods to barter the customer goes without, and many city-dwellers are physically incapable of getting to the farms where the market chiefly thrives. Moreover, the effect on the German mind of the present slender official rations must also be considered. Naturally the Germans are preoccupied with the rationing restrictions because of their comparative novelty and their severity; and naturally, too, as a defeated people, they seek to circumvent a system which may seem to be imposed by their conquerors. The danger now is that isolation, frustration, introversion, and self-pity, reinforced by the meagreness of the official rations, by rumour, and by false propaganda, will establish a myth that the population was deliberately starved after the second world war. One example of this propaganda is to be found in German reports of gross increase in the incidence of tuberculosis—an increase not substantiated by competent outside observers.[2] How rumour may take root is shown again in Dr. Wolff-Eisner's recent book, of which an account is given on p. 228. His integrity in describing the conditions of starvation and neglect which he saw and suffered at Theresienstadt concentration camp is beyond dispute; and no doubt he brings the same honest intention to bear on his later passages where he suggests that conditions in Germany today are not much better than in the camp. This contention, however, is supported only by reference to the publications of other German doctors in which the possible effects of inadequate nutrition are described in general terms, and by rumours of conditions in Hamburg and Düsseldorf. Unlike most Germans, Wolff-Eisner shows awareness of the post-war plight of

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[1] Aschoff, J. *Lancet*, 1948, i, 423.

[2] Tuberculosis in the British Zone of Germany. By MARC DANIELS, M.D., and P. D'ARCY HART, F.R.C.P. H.M. Stationery Office, 1948. See *Lancet*, 1948, i, 416.

Special Articles

ISSUE OF APPLIANCES

Arrangements under the Act

General practitioners may prescribe for their patients the appliances scheduled in the appropriate regulations. Other medical and surgical appliances are provided through the hospital service in which any appliance considered necessary may be prescribed. In general, appliances will be issued free: but in the case of spectacles, artificial limbs, and dentures, certain more expensive alternatives approved by the Minister will be issued on payment of the extra cost. Repairs and replacements will be made without charge except where the need has arisen through the patient's carelessness. In the case of spectacles for pupils whose medical care is the responsibility of the local education authority, any charge is to be recovered, not from the pupil, but from the authority.

OPHTHALMIC SERVICES

Normally, a patient wishing to obtain spectacles, whether or not he already has a pair, must obtain a note from his family doctor, who need not necessarily be on the local executive council's list. Provision is made for patients who are "unable or are unwilling on conscientious grounds" to get a doctor's certificate; these are to get in touch with the executive council.

Having obtained a note from his doctor the patient may then attend either an ophthalmologist or an ophthalmic optician. No doctor's note is needed for subsequent visits.

If glasses are required, the prescription is sent through the post; and the patient then chooses an ophthalmic or dispensing optician from whom to obtain them. The Ministry's schedule allows for the free issue of the following types of lens: spherical, cylindrical, or sphero-cylindrical, prisms, tinted, lenticulars, and, when clinically necessary, bifocals. Meniscus or toric lenses, or equivalent forms, and a wider range of frames are listed as obtainable on payment by the patient of the extra cost. As regards replacements and repairs, part of the cost, in the case of these special lenses and frames, will be borne by the patient; and if the need has arisen through carelessness the patient will always pay the whole cost.

The supplementary ophthalmic service is to be replaced by the permanent hospital ophthalmic service as soon as this can be built up. In the meantime boards of governors and management committees are urged to appoint dispensing opticians, on either a whole-time or a part-time basis; and, on behalf of hospitals, the Ministry's supplies division are to negotiate contracts with manufacturers and prescription houses. Patients who obtain their prescriptions at a hospital are at liberty to take them to an outside ophthalmic or dispensing optician; and in this event the optician recovers his charge from the hospital.

Artificial eyes are to be provided exclusively by the hospital service, and will be prescribed by ophthalmologists. Acrylic eyes are made by the Ministry of Pensions, which is able to supply these at short notice; and hospital committees and boards are advised to notify this Ministry's chief regional officer when the attendance of a fitter is required. In difficult cases a special eye will be made from a cast, at the Ministry's optical appliances depot. Contracts are being placed with firms for the supply of artificial eyes.

HEARING-AIDS

The 'Medresco' hearing-aid, devised by the electro-acoustics committee of the Medical Research Council with the help of the Post Office research department, is to be issued in two forms—one with external magnetic receiver, and the other with insert crystal receiver. The aids are to be issued, serviced, and supplied with batteries, free; but they will remain Government property. Initially only a limited number of hospitals will take part in the scheme, which will, gradually be expanded. It is expected that by the end of this year there will be sufficient audiometers for the principal hospitals participating in the scheme. Patients will normally be examined only on reference by their family doctor. The number requiring aids is uncertain; but since in the early stages demand is certain to exceed supply, priority will have to be given to the very deaf and to those handicapped in their work.

Major repairs are to be undertaken by the manufacturing firms. Distribution centres will receive a supply of replacements; the patient with a defective aid which has to be sent away will have the receivers removed and attached to a replacement, which will be issued in exchange for the defective aid. Minor repairs will be undertaken by technicians on the spot.

MEDICAL AND SURGICAL APPLIANCES

For patients both inside and outside the hospital, medical and surgical appliances are to be prescribed through the hospital service. Subject to special arrangements for artificial limbs, wheel chairs, and hearing-aids, it will be for the practitioner in charge of the patient to prescribe the appliance he considers necessary. But though, for the control of materials, children's shoes such as 'Start-Rite' can be obtained only on medical certification, these are not regarded as appliances and will not be supplied under these arrangements.

Appliances will be obtained by hospitals under a system of central contracts arranged by the Ministry of Pensions; and where necessary the contractor should be asked to arrange for the attendance of a fitter. Appliances so provided will be of good workmanship, design, and quality, and made from materials of high quality. Any patient wanting an appliance more expensive must make his own arrangements and meet the whole cost, except in the case of artificial limbs and dentures; here, as with glasses, the patient may have more expensive types approved by the Minister on payment of the extra cost. Duplicate appliances will be supplied only where the patient would suffer undue hardship through a single appliance becoming unserviceable, and where the occasional or alternative use of two appliances is medically desirable.

For the supply of an artificial limb the surgeon in charge of the patient may prescribe the type of limb required; or alternatively he may leave the prescription to the Ministry of Pensions limb surgeon. Hospitals will always inform the Ministry of Pensions of any patient needing an artificial limb; and arrangements will then be made for the patient's transfer to a Ministry of Pensions hospital or for his attendance as an outpatient at a *limb-fitting centre*. If desired, non-urgent cases requiring amputation will be transferred for the operation to a Ministry of Pensions hospital. In all cases subsequent action for the supply, repair, and renewal of artificial limbs will be undertaken by this Ministry; and for these purposes patients should be advised to communicate with the chief regional officer of the Ministry of Pensions.

The Ministry of Pensions is also responsible for the issue, repair, and renewal of wheel chairs. Motor-propelled chairs will normally be provided for patients who: (1) have undergone amputation of both legs, at least one above the knee; (2) are paraplegic; (3) have totally or almost totally lost the use of the legs; or (4) are badly disabled and need a machine to obtain or retain employment. Hand-propelled chairs will normally be provided to patients who: (1) are entitled to a motor-propelled chair but are medically unfit to drive one or prefer a hand-propelled chair; (2) have undergone double amputation below the knee; (3) need a chair "waking state" in an anæsthetised female gorilla with an aberrant stimulus during some experiments on the motor cortex, and he left his hearers to visualise the response produced in his own central nervous system. Again, Davy found that stimulation of part of area 8 with 20 millisec. pulses caused such violent intestinal peristalsis that intussusception invariably occurred. Earlier experiments, in which the duration and frequency of stimulus had not been so well controlled, had such divergent effects on the activity of the gut that the results could not be interpreted. The same was true of experiments on the activity of the gastric mucosa in secreting hydrochloric acid and pepsin.

From all this evidence Professor Fulton urged that knowledge of the correct parameters of stimulation were essential for the interpretation of cortical activity. He went on to apply these considerable advances in the technique of experiments on the cerebrum to the results of stimulation of the cerebellum.

In considering localisation of function and of the representation of the body in the cerebellum, Professor Fulton dealt with its anatomy and then with the effects of ablation and stimulation. The generally accepted division of the cerebellum is that of Larsell. On the basis of this division, the lobulus simplex of the anterior lobe represents movement of the head on the trunk, the culmen of the arm, the lobulus centralis of the leg, and the lingula of the caudal region. Hence, the spider monkey, which has an active and prehensile tail, has an extraordinarily well-developed lingula, which is very small in man.

Isolated removal of the nodulus causes a disturbance of equilibration, as Dow found, and this experimental observation is supported by the clinical fact that mid-line cerebellar lesions cause a disorder of balance without a commensurate disturbance of movement of the limb. Furthermore, medulloblastomas, which originate in the nodulus in children, are often present with a disorder of equilibration. Bard found that, whereas removal of parts or all of the cerebral hemispheres had no effect on motion sickness in dogs and monkeys, it was impossible to produce any disturbance in these animals after extirpation of the nodulus of the cerebellum.

It is difficult to remove the anterior lobe of the cerebellum, but if this is achieved there are grossly exaggerated supporting reactions which when studied alone are hard to interpret. When motor disorder is produced by experimental removal of the motor and premotor cortex in dogs, with a resulting hemiplegia, the effect of local removal of part of the anterior lobe of the cerebellum becomes more obvious; and, as Adrian has shown, there is clearly a close relationship between areas of the motor cortex and of the anterior cerebellar lobe.

If individual muscles are made to contract by stimuli applied to the motor cortex, and if the same procedures are carried out with simultaneous stimulation of special areas in the anterior lobe of the cerebellum, the resulting muscular contractions can be inhibited. But the importance of accurately controlling the *form of stimulus* is illustrated by the finding that, with different rates and durations of stimuli, facilitation and not inhibition will occur. Furthermore, some parts of the cerebellum are mainly concerned with inhibition and others with facilitation of movements which have been induced by cortical stimulation. Destruction of the dentate nucleus abolishes all inhibitory activity, and destruction of the fastigial nucleus abolishes all facilitation, when the appropriate areas of the cerebellum are stimulated.

Experiments of this kind show that there is accurate representation of the body in the anterior lobe of the cerebellum. The body in fact is represented spread-eagled, head downwards. The limbs are represented laterally, the digits being farthest out. The anterior lobe is concerned with posture, the body being accurately represented in it; the posterior lobe is concerned with the phasic relations of muscles; and the nodulus is responsible for equilibration. The cerebellar mechanism seems to be integrated with that of the cerebral cortex by causing inhibition or facilitation of muscular contraction as the needs of the moment demand, and there is now some experimental evidence as to how this is brought about.

THE BEWILDERED REBEL

To describe the delinquent as a "rebel against authority," Dr. Iago Galdston remarks,[1] is to introduce a corrupting fiction; for it suggests that on one side stands authority, and on the other a youth who will not accept or yield to that authority. But suppose the boy sees authority as a dangerous enemy? Or suppose he wishes to yield to authority but cannot? Is he still a rebel? The phrase, which Dr. Galdston quotes from New York County Lawyers Association's "statement of purpose," is partly redeemed by a *further concept* of the juvenile delinquent as sick rather than guilty. But to this he adds the query: "'Sick, how, as with typhoid or as with rickets?' For this makes all the difference possible." In one case the *patient* is attacked by a bacillus, in the other he is deprived of a need. If we ask "what *makes* the criminal?" we are shuffling off the blame, saying "there but for the grace of God go I;" and that, in Dr. Galdston's view, is a pharisaical and blasphemous remark—"as if it were all up to God, or to Fate, or to what you will, but not including us!"

Man is born, he reminds us, a grossly asocial animal, ridden hard and fast by his primitive instinctual drives; but carrying too the competence to love and the ability to learn by experience. The competence to love, in which all altruism is rooted, can only be realised in experience, however; and for too many people the chance is wanting. What experience they get inhibits rather than advances their social development. "Neither neurotic nor criminal behavior is individually or socially effective, and at the root of both failures lies the unrealised potentialities to love." Delinquency, then, is a deficiency disease, and the treatment is to alter the cultural atmosphere of our civilisation so that it allows the individual to realise his capacity for love and altruism.' Specifically this could be done, he thinks, by creating colonies for confirmed criminals, in which, though segregated, they could lead productive lives, as near to normal as possible; by getting rid of reformatories by degrees, and placing juvenile delinquents in specially selected foster homes; by training a large body of psychiatrically informed teachers, nursery-school supervisors, nurses, and social workers to keep guard over the young; and by providing plenty of child-guidance centres.

THE SUPERANNUATION OPTION

IN a leading article last week we drew attention to what we regarded as a fault in the arrangements by which practitioners holding suitable life-assurance policies may opt out of the National Health Service superannuation scheme. The condition whose effect would in some cases, we thought, be unfair was that the doctor would not have this option if his policy had been assigned to any other person. We are glad therefore to learn from the British Medical Association that, where the policy has been assigned for the purpose of a loan on the purchase of a practice, the Ministry of Health has agreed to waive this condition, provided the practitioner undertakes (1) to render the policy free from assignment as soon as possible and, in any case, when he receives his compensation under the Act for the loss of the right to sell his practice, and (2) not to assign the policy again.

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[1] A Medical and Social Critique of Delinquency. Address delivered at the Colloquium on Juvenile Delinquency, March 20, 1948, under the auspices of the New York County Lawyers Association.

fractures in Theresienstadt and says that these are "related to sprue." Those who recovered from enteritis frequently developed œdema.

Apparently œdema was common. Like other workers in similar circumstances, Wolff-Eisner had difficulty in deciding which were simple cases of famine œdema and which were due to other causes, notably heart-failure. This might well have been important in Theresienstadt because many of the inmates were elderly. Many had a low blood-pressure and vasomotor instability.

VITAMIN DEFICIENCY

The classical diseases of vitamin deficiency do not seem to have been encountered, except possibly pellagra, which is said to have been "frequent" and to have improved under treatment with niacin; but there is no clear description from which the grounds for the diagnosis of pellagra may be judged. Scurvy is not mentioned, nor is there any clear indication of nutritional polyneuritis though the "spastic paretic" gait of many people walking about the camp is described; they trailed their feet, with frequent falls sometimes resulting in fractures of the femur. No indication of the type and frequency of anæmia is given, but two other doctors[3] interned in Theresienstadt have reported that it was usually orthochromic and was associated with several unusual clinical features. They attribute the anæmia to protein deficiency.

The mental consequences of underfeeding are well described—difficulty in remembering the names of colleagues and even important recent events. This is mentioned in apology for the shortcomings of the report; but the wonder is that Dr. Wolff-Eisner has been able to remember so much and describe it in terms that leave no doubt of its essential accuracy. The mode of death in starvation is also well described. The patient, weak but lucid, is talking at one moment, and then after a sudden effort, such as trying to get out of bed, is found to be dead.

INFECTIOUS DISEASES

The whole nutritional picture was complicated by the impact of various specific infectious diseases, as is usual in such circumstances.

In 1942 and 1943 a large epidemic of enteric fever swept through the camp. Clinically, it was like what the author had seen in the 1914–18 war, but an unusual feature was the frequency of recurrent attacks, often with a return of typical typhoid roseola; out of 80 of his cases, 5 were recurrences. The epidemic progressed although the majority of prisoners had been inoculated with T.A.B., and then it gradually died out despite the onset of hot weather and the constant influx of new unexposed prisoners. This was probably the result of energetic measures by the prisoners themselves to improve the hygiene of the camp. Survivors from the fever were often left with œdema or tuberculosis.

In 1943–44 there was an epidemic of a mild kind of encephalitis, from which the majority recovered. Scarlet fever and diphtheria occurred, and followed a normal course; there was a plentiful supply of serum for treating the latter, but postdiphtheritic paralysis appeared to be a more frequent complication than usual. Mumps was common, with frequent orchitis; whooping-cough was rare. Pneumonia, said to have been mainly bronchopneumonic with few physical signs, was responsible for a large morbidity; recurrences were common, but the number of deaths "not as great as expected." Tuberculosis was very prevalent, usually with an insidious onset and rapid course; effusions were frequent and the spread was most often miliary. Many cases were not diagnosed until necropsy, as was also the case at Belsen.

In the final month of the war there came the inevitable consignment of about 1000 emaciated, verminous, and typhus-ridden prisoners who, as at Belsen, were simply turned loose in the camp. An epidemic followed, with about 30 new cases a day; but before the liberation, the number had dropped to 4–5 daily. As elsewhere in Europe where typhus appeared in 1945, the disease carried a much lower mortality than the epidemics of 1918; despite the evident poor resistance of the inmates and absence of previous immunisation, the mortality was only 15–20%.

DEATHS

The author gives some official statistics for the number of deaths between January, 1942, and April, 1944; these are illustrated by the following round figures, derived from his tables, which relate to a population of 30,000–60,000 in the twelve months between August, 1942, and July, 1943:

	No. of deaths
"Old age"	5400
"Enteritis"	7800
Pneumonia	4000
Tuberculosis	500
Total from all causes	23,200

"Old age" of course included many nutritional deaths, and "enteritis" included deaths from both enteric fever and famine diarrhœa.

NATURE OF NUTRITIONAL DISORDERS

In discussing the ætiology of the nutritional disorders he observed, Wolff-Eisner introduces a number of concepts that will seem strange to those accustomed to the recent Anglo-American literature, with which, understandably enough, he appears to be unfamiliar. He revives an old German idea that deficiency of fat is an important factor in the ætiology of famine œdema, and he does not indicate that reduced plasma-albumin, resulting from insufficient protein intake, may itself be a cause of œdema. He believes that some disturbance of the reticulo-endothelial system affects the albumin-globulin ratio and is responsible for the formation of tissue exudates and the rapid erythrocyte-sedimentation rate in starving people. He insists that simple lack of calories was not a significant factor in the mortality and that vitamin deficiencies were much more important—despite the fact that his descriptions provide no certain evidence of such deficiencies except for hemeralopia and the mention of cases of pellagra. He admits that yeast was distributed in the camp without effect on morbidity, but argues that this showed how very great was the deficiency of vitamin B.

Translated into practical terms, he feels that what the prisoners needed most was not more carbohydrate but more meat, fish, fat, fruit, and vegetables. With this conclusion there can be no quarrel; such protective foods would certainly be the best remedy for a starvation diet, as sources of both calories and essential nutrients. But his reasons for the conclusion are less convincing. General experience is that vitamin deficiencies are rare with severe under-feeding, probably because the need for most vitamins diminishes as the calorie intake lessens.

PHYSICAL ANTHROPOLOGY

FROM A CORRESPONDENT IN NEW YORK

THE Viking Fund, of New York City, under the direction of Dr. Paul Fejos, has been supporting anthropological research for a good many years, but it is only recently that its efforts at stimulating physical as well as cultural anthropology have brought its activities to the attention of those in the medical field.

This summer, for the third year in succession, the Fund has financed a seminar, which discussed two subjects, each for five days; the first was Growth, and the second Evolution. The official discussants, whose expenses are paid by the Fund, included one British expert in each field: Dr. J. M. Tanner on growth, and Prof. W. E. Le Gros Clark, F.R.S., on evolution.

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[3] Pick, A., Salus, F. *Acta med. scand.* 1947, 129, 389.

in the interest of health; or (4) have undergone double amputation and need an invalid chair for indoor use to afford relief from the wearing of artificial limbs.

Replacements and repairs (except of artificial limbs, and invalid chairs and tricycles, for which the Ministry of Pensions is responsible) will be done through a hospital. But to relieve hospitals, minor defects not affecting function will be referred by the patient to the Ministry of Pensions regional office or sub-office, which will arrange for the repair to be done and the appliance returned to the patient. The liability of the patient to pay for replacements or repairs occasioned by carelessness will be decided by hospital management committees or boards of governors; and the patient will have the right to appear before the committee or board. Patients under treatment in private blocks will be entitled to the free issue of appliances; and it will be for regional boards to ensure that hospitals outside the service with whom they have contractual arrangements for the treatment of patients are able to obtain any necessary appliances for these patients.

LIFE AND DEATH IN A CONCENTRATION CAMP

THE clinical consequences of famine have been well described by several British doctors released from Japanese prison camps.[1] But in Europe, where starvation diets have usually consisted of black bread (baked from wheat or rye and often adulterated with barley, potato flour, or even sawdust), bean soup, and variable amounts of potatoes and other root vegetables, the pattern of deficiency disease differs from the pattern in the Far East, where polished rice is preponderant. Since famine is rare in Europe, and the doctors on the spot have seldom had the time or experience to make careful records, good clinical observations are scarce, and those made by Dr. Wolff-Eisner[2] while a prisoner in Theresienstadt concentration camp are correspondingly valuable.

Wolff-Eisner is well known in Germany for his work in clinical serology. Born in 1877, he was a professor of internal medicine in the University of Berlin, and sub-chief of the Robert Koch Institute, until his imprisonment by the Nazis. Since his release he has become medical director of the Schwabinger Hospital for Displaced Persons in Munich and director of the serological laboratory of the Munich University clinic for nervous diseases.

DESCRIPTION OF THE CAMP

Theresienstadt, an old fortress near Vienna, was a "privileged" concentration camp intended primarily for elderly Jews. The inmates, increasing from 30,000 to 60,000 between 1942 and 1945, came mainly from Germany but also from Denmark and Holland. In addition there were some, of all ages, from Czechoslovakia. It seems that at first conditions were reasonably humane. The buildings, though antiquated (mainly 18th century) and poorly ventilated, were adequate. The inmates had a certain degree of self-government; small food parcels were occasionally received from relatives outside Germany, and the camp was inspected by observers from neutral countries. A little smuggled money was in circulation. The medical service, staffed by imprisoned university teachers, had a hospital of 5000 beds with good X-ray and routine laboratory facilities, except that, significantly, no bacteriology was permitted.

Gradually, however, the typical story unfolded. More and more prisoners arrived, often in a dreadful condition after appalling journeys in cattle-trucks from various transit camps. (Wolff-Eisner quotes a heartrending account by Dr. Roland, who accompanied Paul Ehrlich's son on one such journey.) The camp became overcrowded; the food deteriorated; disease increased; and fleas, lice, and bedbugs swarmed everywhere, so that many preferred to sleep in the cold out of doors. As prisoners died they were rapidly replaced by new arrivals. Large numbers, estimated by Wolff-Eisner at more than 80,000, were taken off to Birkenau and Auschwitz for extermination. Last of all came the typhus. The end-result must sound very familiar to those who saw Belsen at the time of its liberation—people crowded into 3-tier bunks, those on the upper levels often too weak to move, with intractable diarrhœa, covered with vermin, and out of reach of medical care.

THE CAMP DIET

The official diet of those "over age" provided 330 g. of bread daily, with only 50–60 g. of fat and sugar weekly. The daily allowance of potatoes was 180–250 g., but these were often unwholesome. A "lentil extract" soup, of doubtful nutritional value, was especially dreaded for its laxative properties. Small quantities of other foods brought the official calorie-value of the rations up to 1650 a head daily, but there must have been very many who got nothing like this amount, especially as the leaders among the prisoners saw to it that children and workers had more than their official share. Then there was the inevitable black market around the kitchen, and the potato-peelers were often found stealing potatoes or eating them raw, with subsequent diarrhœa in retribution. When it is considered that many of the prisoners had undergone much privation before arrival, it is not surprising that nutritional disorders soon began to appear.

Most of the prisoners became thin, losing up to 30–40% of their original weight. This, probably aided by frequent coughs, resulted in a high incidence of new hernias. Nocturia (4–5 times in a night) Wolff-Eisner puts down to "irritable bladder," but it was more probably part of the polyuria which precedes famine œdema. "Socially unpleasant" flatulence, ascribed to the high-carbohydrate diet, was always troublesome and persisted for months after liberation and return to a good diet. Hemeralopia, attributed primarily to the low fat intake, was very common and is said to have responded "fairly well" to the administration of vitamin-A concentrates. Curiously enough, glaucoma also appears to have been common, even among young people, and a number of cases were successfully treated by operation. At times the majority of inmates suffered from an intractable conjunctivitis which sometimes left permanent damage to the cornea. Skin infections such as impetigo, furunculosis, and carbuncles, were very troublesome; and therapeutic injections often caused abscesses. Scabies is not recorded (it was also uncommon in Belsen). Frequent bedsores, atrophy of the skin, loss of hair and of its natural gloss, brittle nails, dysphagia, and loose teeth are other conditions mentioned.

INTESTINAL DISORDERS

Among the "special diseases" of Theresienstadt, enteritis was the most dreaded. The onset was usually a simple attack of diarrhœa, often with some fever and perhaps the result of a simple infection; but the diarrhœa might persist and the patient sometimes died. The stools were bulky, paler than usual, foamy and highly acid, but (naturally, in view of the diet) contained little fat; blood or mucus were rarely seen. Wolff-Eisner is undoubtedly right in thinking that this condition was due to nutritional deficiency rather than any specific dysenteric infection. It seems to have been identical with the "famine diarrhœa" with which workers at Belsen and in the Bengal famine became so familiar. He remarks on the frequency of osteoporosis and spontaneous

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[1] For example: Simpson, J. *Lancet*, 1946, i, 959. Clarke, C. A., Sneddon, I. B. *Ibid*, p. 734. Harrison, G. F. *Ibid*, p 961. Hobbs, H. E., Forbes, F. A. *Ibid*, 1946, ii, 149. Burgess, R. C. *Ibid*, p 411. Mitchell, J. B., Black, J. A. *Ibid*, p 855. Walters, J. H., Rossiter, R. J., Lehmann, H. *Ibid*, 1947, i, 205, 244.

[2] Wolff-Eisner, A. Über Mangelerkrankungen auf Grund von Beobachtungen im Konzentrationslager Theresienstadt. Wurzburg, 1947.

Disabilities

10. THE ALCOHOLIC *

A person who has lost the sight of an eye, or who has had a leg amputated, is forced to face the fact that he must adjust his life to suit his disability. It is the same with an alcoholic, who must also learn to accept his disability. Leaving aside the question of any higher power, nothing stands between him and the ravages of his disease but his own will. No-one can cure an alcoholic: he is incurable. No-one but himself can reclaim him, and the first step in his reclamation must be the realisation that he is suffering from an incurable disease. Unlike his fellow men, the heavy drinkers and the light drinkers, he alone can ensure (in the words of Alcoholics Anonymous) that he " never takes the first drink."

What is an alcoholic ? To me, as a layman, he is a person who has no control over himself where alcohol is concerned. Give him one drink and he will drown his body, his mind, and his reputation in alcohol and will go down for the third time still drinking. A drunk may drink until he passes out, but he will learn his lesson. An alcoholic can never learn his lesson, as long as he drinks.

How does one become an alcoholic ? I suppose there are many ways, just as there are many degrees of alcoholism. I can only give my own experience. An alcoholic will always find something other than himself to blame, and I was no exception to the rule—the war (1914–18) ; the peace ; prohibition in America ; business worries ; an unfortunate love affair ; and again the war. I started drinking whisky as a young soldier at the age of 16½. It was fun to get drunk, and what did it matter ? One might be dead tomorrow. By the time the war ended I was used to drinking. It was still fun, and in the London of the 'twenties there were always parties, so why not get drunk ? During prohibition in America everybody drank all they could get. So again, why not ? The fact remains that, though I did not know it at the time, I was an alcoholic from the moment I took my first drink.

It took a good many years for the thing to creep up on me, and a good many more for me to realise it. From the enjoyment of a party, with a good deal to drink and a reasonably clear head the next day, came the foregone conclusion that I would get drunk, and pay for it with a monumental hangover. It was a short step from there to the morning drink (the hair of the dog) to cure the hangover and eventually to lead to the next one.

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By this time I was in a pretty bad state physically. I was either not sleeping at all or sleeping for a few hours and waking with a jerk, to lie shaking with nerves for the rest of the night. I had become antisocial, avoiding my friends and the company of people who knew me. When actually drinking I would talk to anyone who would talk to me, but I usually chose someone of a lower social level, probably because it gave me a much-needed feeling of superiority. I was intolerant of criticism, my attitude in general being " If you don't approve of my behaviour it shows what a fool *you* are."

As to why I was drinking, I don't really know. To escape from situations which I did not like and which I knew, inwardly, were of my own making. My home life, such as it was, was unhappy. My wife nagged, because she was frightened and I was practically impotent sexually. I had a continuous craving for excitement, emotional experiences, and friendships. I longed to escape from the boredom and worries of everyday life and the dissatisfaction with my job, which was in turn caused by my drinking. The more I drank the less I found what I wanted or was capable of responding to it if I found it. I was in a vicious cage, from which the only escape seemed to be drink.

Finally, to use a cinema cliché, " came the dawn." I woke one morning feeling worse than ever before. I remembered nothing. I didn't know where I was and I had no money in my pockets. I knew, not for the first time, that I was playing ducks and drakes with my future and was likely to lose my job at any minute. I swore I would never take another drink—but what was the use ? I had done that before. Maybe I wouldn't drink for a while, but sooner or later, at the most unlikely moment (probably) I would take the first drink. The merry-go-round would start, and I should be a passenger until such time as it chose to stop.

It was then that I sought out Alcoholics Anonymous (A.A. to its members) and learnt the two slogans which were to be—which are to be, please God—my salvation. The first is, " Never take the first drink," but the second is the more important : " I won't have a drink *today* " —not for a week, not for a month, not never, but just today.

Most alcoholics are by nature convivial. They like the fun of social intercourse, of parties, of people, and by the very nature of their disease these things lead to the indulgence in alcohol which is, to them, fatal.

How then does an alcoholic who does not drink carry on with his normal life ? I was in the habit of going to a pub or a club in the evenings. Some of my fellow members of A.A. had, I knew, given up their drinking friends, resigned from their golf clubs, cut themselves off from all their normal outlets for relaxation. They had, in general, behaved like startled hermit crabs. I made up my mind that I would do no such thing. If I did, I would inevitably start drinking again from sheer boredom, which was about the one excuse I had never used.

I continued to see my friends, drunk and sober, but I didn't drink. If my friends bored me rather, when they were drunk, it was a useful yardstick to measure how boring I must have been to them.

At first I drank tomato juice, until I found that over-indulgence in that beverage had an effect different from but almost as uncomfortable as over-indulgence in alcohol. Thereafter I varied my temperance tipples —ginger beer if it was hot ; tomato juice if it was cold ; and as a standby gin and tonic without the gin. In bars where I am known, and where the double whisky used to be set up as I came through the door, I now order a double gin and tonic. This is an accepted joke, but if I tried to get the gin into it I would find myself involved in an embarrassing explanation with the barman, who knows and approves of what I am doing.

My friends, with one or two exceptions (who are not perhaps as good friends as I thought), are delighted. I know that, even if I begged for it, I wouldn't get a drink in their houses or in their company, and I'm proud of it. I am not, as I feared, a bore ; on the contrary, I was a bore before, but didn't know it.

There are, I have discovered, worse deprivations than that of alcohol, and freedom from it brings many and unexpected benefits. I now know that what can't be cured can be endured far more easily than I had thought. For the first time in years I feel well. My hand is steady

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* By a Member of Alcoholics Anonymous, BM/AAL, London, W.C.1.

GROWTH

Human and animal growth has long been neglected by anatomists, physical anthropologists, and physiologists alike, despite the advantages inherent in studying anatomical structure or physiological function through its developmental phases, in biological time as well as space. In consequence, the first half of the seminar was essentially non-technical minutiæ. Set papers were given by Prof. H. C. Stuart on differential growth from the pædiatric viewpoint, Dr. F. E. Randall on the termination of growth in young males, Dr. Pauline Mack on diet and growth, and Dr. W. M. Krogman on general organisation and objectives of growth studies.

Professor Stuart described his own growth study in the school of public health at Harvard University. He gave it as his opinion that predominantly endomorphic or fat adults are plump as babies, and thin adults thin as babies, despite regular variations in the average fatness of the entire group during the growing period; and he remarked that the only sane way of diagnosing malnutrition in a child that he was aware of was the therapeutic test of response to a known optimal diet and environment over a period of about a month.

Dr. Randall, in measuring U.S. Army personnel, had found no increase in stature or sitting height after age 18, and none in chest girth, waist girth, bideltoid diameter, and weight after 28, in an under-40 group. In the following discussion it emerged that head length similarly ceased growth at 18, but head breadth or circumference, which included muscle and fat, continued growing into the twenties.

Dr. Mack gave some preliminary results from a most extensive study of growth and nutrition made in Philadelphia. She found that in orphanages weight and stature gains could be increased somewhat by dietary means even though the orphans were getting the, to us, high rations recommended by the National Research Council: the important factor was high-class animal protein. Family studies had also shown, amusingly enough, that when economic factors were held constant the best-nourished children next to old Americans were those with a German mother and an Irish father, and conversely the worst-nourished those with an Irish mother and a German father.

In the discussion following Dr. Krogman's paper the use of indices such as the cephalic index or height/weight index was attacked on biometric grounds by Dr. Tanner, who pointed out that such indices failed to do exactly that which they were supposed to—namely, rule out of consideration the aspect of general largeness in comparing two or more animals for build differences. There emerged a very general agreement on the undesirability of indices, in particular the cephalic index, and a strong interest in the methods of factor analysis as applied both to the classification of human physique and in relation to the classificatory problems of the taxonamist. There was unanimous condemnation as downright vicious of the use of simple height/weight tables for assessing the growth, build, or nutrition of children.

In the final summarising speech of this part of the conference, Dr. Tanner stressed the need for publication of the raw data of human growth studies: such data took twenty or thirty years and enormous amounts of money to collect, and yet in several instances had been reported in such a fragmentary way (owing on at least one occasion to the death of the collector) that only a fraction of the possible information had become available.

EVOLUTION

Evolution occupied five sessions, two of which were devoted to discussion of the recent fossil finds in South Africa and Kenya. This material was described by Professor Le Gros Clark, and the members of the seminar sent messages of thanks to the two anthropologists, Dr. Broom and Dr. Leakey, who were responsible for digging up these most valuable finds. It was most unfortunate that Prof. F. Weidenreich, one of the chief discussants, was prevented from attending by illness.

The ape status and erect posture of Australopithecus appeared to be a less disputable subject than on some previous occasions, and though Dr. Strauss, of Johns Hopkins University, still expressed a waning doubt that the hip-bone and the others were from the same animal, the majority were convinced.

Dr. A. H. Schultz gave a paper on evolutionary trends amongst the primates, in which again the question of relative growth as expressed by indices—the arm-length/trunk-length and similar ones this time—was raised, Dr. Erickson, of Harvard University, feeling this was an insufficient way to adjust for size differences between species. A factorial-analysis approach by pooling related species' measurements and using the factors to define new sets of species was adumbrated.

CENTRAL HEALTH SERVICES COUNCIL

The council held its first meeting on July 27, when Mr. F. Messer, M.P., was elected chairman and Prof. Henry Cohen vice-chairman. The members are:

EX OFFICIO

Lord Moran, M.C., M.D., president of Royal College of Physicians of London. Lord Webb-Johnson, K.C.V.O., C.B.E., D.S.O., president of Royal College of Surgeons of England. Sir William Gilliatt, C.V.O., M.D., M.S., president of Royal College of Obstetricians and Gynæcologists. Dr. H. G. Dain, chairman of council, British Medical Association. Sir Herbert Eason, C.B., C.M.G., M.D., M.S., president of General Medical Council. Dr. G. F. Buchan, F.R.C.P., chairman of council, Society of Medical Officers of Health.

MEDICAL PRACTITIONERS

Miss Janet Aitken, M.D., F.R.C.P., senior physician to Elizabeth Garrett Anderson Hospital. Prof. W. G. Barnard, F.R.C.P., dean of St. Thomas's Hospital medical school Mr. Aleck Bourne, F.R.C.S., F.R.C.O.G., gynæcologist to St. Mary's Hospital. Dr. J. A. Brown, general practitioner in Birmingham and vice-chairman of representative body, B.M.A. Sir Ernest Rock Carling, F.R.C.S., F.R.C.P., consulting surgeon to Westminster Hospital. Prof. Henry Cohen, F.R.C.P., physician to Liverpool Royal Infirmary. Dr. E. A. Gregg, general practitioner in London and chairman of representative body, B.M.A. Dr. W. V. Howells, anæsthetist to Swansea Hospital and member of council, B.M.A. Dr. Horace Joules, F.R.C.P., medical director of Central Middlesex Hospital. Prof. A. J. Lewis, F.R.C.P., director of clinical psychiatry, Maudsley Hospital. Dr. W. G. Masefield, C.B.E., formerly medical superintendent of Brentwood Mental Hospital. Dr. W. N. Pickles, M.R.C.P., general practitioner at Aysgarth, Yorks. Sir Harry Platt, M.S., M.D., professor of orthopædic surgery in University of Manchester. Prof. J. C. Spence, M.C., F.R.C.P., physician to Royal Victoria Infirmary, Newcastle-on-Tyne. Dr. C. W. Walker, general practitioner in Cambridge.

PERSONS WITH EXPERIENCE IN HOSPITAL MANAGEMENT

Mr. F. J. Cable, F.H.A. Mr. Clayton Fryers, C.B.E., F.H.A. The Hon. A. J. P. Howard, C.V.O., M.P. Sir Owen Morshead, K.C.V.O., D.S.O., M.C. Major-General Sir Harold Wernher, K.C.V.O.

PERSONS WITH EXPERIENCE IN LOCAL GOVERNMENT

Alderman A. F. Bradbeer. Sir Wynne Cemlyn Jones. Mr. Fred Messer, M.P., J.P. Mrs. Dorothy Turtle. Alderman W. E. Yorks, J.P.

DENTAL PRACTITIONERS

Mr. F. J. Ballard. Mr. Joseph Lauer, L.D.S., R.C.S. Mr. H. T. Roper-Hall, M.B., M.D.S.

PERSONS WITH EXPERIENCE IN MENTAL HEALTH SERVICES

Sir Cecil Oakes, C.B.E.

REGISTERED NURSES

Miss Eleanor J. Merry, S.R.N., S.C.M. Miss Mary E. G. Milne, O.B.E., S.R.N., S.C.M.

CERTIFIED MIDWIFE

Miss Nora B. Deane, M.B.E., S.R.N., S.C.M.

REGISTERED PHARMACISTS

Mr. R. H. Henriksen, A.R.I.C., M.P.S. Alderman W. J. Tristram, J.P., M.P.S.

There is one further appointment to be made. The secretary is Mr. E. J. S. Clarke of the Ministry of Health.

Disabilities

10. THE ALCOHOLIC *

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At first I drank tomato juice, until I found that over-indulgence in that beverage had an effect different from but almost as uncomfortable as over-indulgence in alcohol. Thereafter I varied my temperance tipples —ginger beer if it was hot ; tomato juice if it was cold ; and as a standby gin and tonic without the gin. In bars where I am known, and where the double whisky used to be set up as I came through the door, I now order a double gin and tonic. This is an accepted joke, but if I tried to get the gin into it I would find myself involved in an embarrassing explanation with the barman, who knows and approves of what I am doing.

My friends, with one or two exceptions (who are not perhaps as good friends as I thought), are delighted. I know that, even if I begged for it, I wouldn't get a drink in their houses or in their company, and I'm proud of it. I am not, as I feared, a bore ; on the contrary, I was a bore before, but didn't know it.

There are, I have discovered, worse deprivations than that of alcohol, and freedom from it brings many and unexpected benefits. I now know that what can't be cured can be endured far more easily than I had thought. For the first time in years I feel well. My hand is steady and my brain functions as it ought. I take pleasure in many activities, mental and physical, which had long been closed books to me. My home life is normal and happy.

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* By a Member of Alcoholics Anonymous, BM/AAL, London, W.C.1.

There are, of course, moments of depression, moments of temptation—times when things go wrong and it seems that nothing but a good stiff drink will ease the situation. There always seems to be, though, another fellow who needs help over the stiles far more than I need a drink, and in helping him the moment passes.

There lies the strength of A.A. You would be a pretty poor sport if you refused to help someone because you wanted a drink yourself, and you would be a pretty good hypocrite if you had a drink first and didn't admit it. And anyway, you can't fool an alcoholic on alcohol. He knows more answers than you can think up.

I no longer say, "I will never drink again." I know that it is always possible that I may take a drink tomorrow, but I say, with ever increasing confidence, "I won't have a drink today." And so it adds up. One day without a drink added to another soon makes a week; a month. Every person helped is another prop to one's own defences, and every alcoholic reclaimed is another member of A.A., and so it goes on.

A diabetic does not voluntarily take sugar. He certainly wouldn't if he knew that having had one spoonful he would inevitably finish the bowl. Alcohol, to the alcoholic, is like that. And this is why an alcoholic can never drink. He must adjust his life rationally to his incurable disability and make the most of the great deal which is left.

Medicine and the Law

Mistaken Diagnosis of Cancer

Mr. Justice Birkett's decision in Whiteford *v.* Hunter and Gleed is disquieting to the medical profession. A 70-year-old plaintiff sued a surgeon and a general practitioner for damages on the ground of their negligence in wrongly diagnosing his condition. They had told him, he said, that he was suffering from cancer and had only nine months to live. He had thereupon given up a business in London which brought him in £1600 a year, and a company directorship worth another £150, had sold his books and furniture, and had gone off to America (his wife's native country) to die. An American surgeon had then operated upon him for a bladder complaint which he declared to be the sole and the obvious cause of his condition. This operation had established that there was no cancer and had restored him to health. The plaintiff claimed that he had suffered pecuniary loss and mental agony as a result of the defendant's mistake. The allegations of negligence by way of mistaken diagnosis were made against both defendants without distinction, but, as Mr. Justice Birkett observed during the course of the hearing, the defendants pleaded that the diagnosis was made by the surgeon (Mr. J. B. Hunter) and not by the general practitioner (Dr. S. R. Gleed) and that the latter had been acting under the former's instructions.

In the course of the hearing the judge asked the defendant's counsel if there had ever been a case in which a court had assessed damages for the mental distress of a man who had been told that he was going to die. There has, of course, been considerable discussion in legal journals of "shock" cases, including those where a mother has claimed for mental distress on seeing her child placed in danger. The defendants naturally insisted that no practitioner guarantees his opinion to the extent of insuring the consequences to the patient. Mr. Whiteford had to show that no surgeon exercising reasonable care and skill could have come to the conclusion reached by Mr. Hunter. Unless this was proved, the plaintiff failed to establish any lack of care and skill on the part of the defendants.

Mr. Justice Birkett's considered judgment, reported in the *Times* of July 30, stated that the plaintiff, when he saw Mr. Hunter, was suffering from acute urinary retention. Mr. Hunter formed the view that this was due to enlargement of the prostate; he advised immediate draining of the bladder and removal of the prostate gland later. The bladder was drained and the plaintiff subsequently attended hospital on April 5, 1942, for the operation. Mr. Hunter examined the bladder manually and visually; he found an indurated mass in the bladder about the size of the palm of a man's hand; there was no ulceration. After considering this condition for from 20 to 25 minutes, he came to the conclusion that it was a carcinoma which had not yet ulcerated, and that it was inoperable. He made no examination with a cystoscope and took no specimen of the growth for microscopic examination. In the following September, when in New York, the patient came under the care of Dr. Benjamin Barringer who examined him with a cystoscope under a spinal anæsthetic and took a sample of the growth for pathological examination. This revealed cystitis but no cancer. Dr. Barringer operated for removal of portions of the prostate gland; he found the bladder inflamed and a diverticulum filled with calcareous matter.

The learned judge held that no negligence could be attributed to Dr. Gleed. During Mr. Hunter's examination of the patient in April, Dr. Gleed had a partial view of the bladder but it was Mr. Hunter who had charge of the operation. There was no obligation upon Dr. Gleed as a general practitioner either to have or to use a cystoscope. Mr. Whiteford's action against him failed.

As regards the claim against Mr. Hunter, everything turned upon the mistaken diagnosis of inoperable cancer which determined him to do nothing more and which occasioned the patient's loss and damage. "It was," said the judge, "a virtual sentence of death." It was now admitted that the diagnosis was wrong. Mr. Hunter had done nothing afterwards to confirm or verify it. He had given evidence of his reasons for not using a cystoscope and for not making a microscopic pathological examination. There had been medical evidence of the close resemblance between true and simulated cancer. His Lordship said he was clearly of opinion that Mr. Hunter was negligent in not making the microscopic examination; he was lacking in his duty in taking no step to check or verify his diagnosis and also in not making a cystoscopic examination. Judgment was entered against Mr. Hunter for £6300—namely, £2000 general damages for the patient's pain and suffering, and £4300 for special damages claimed, such as his loss of income, his out-of-pocket expenses in departing to America, and his loss on sale of books and furniture. A stay of execution was granted with a view to appeal.

The importance of the decision is obvious. To omit to use all proper and accustomed aids to diagnosis is obviously a breach of professional duty, but Mr. Hunter had given the court his reasons for not having taken other steps. Neither specialists nor general practitioners can guarantee their opinions to be infallible. An honest error of judgment can fall far short of legal negligence. Distressing as they were to Mr. Whiteford, the mental consequences of Mr. Hunter's diagnosis (the "virtual death sentence"), though they made sensational headlines in the lay press, do not alter the principles of law. It is so easy to be wise after the event. If courts receive authoritative professional testimony that an opinion, although ultimately proved to be wrong, was neither impossible nor unreasonable at the time and in the circumstances of the particular case, nothing but overwhelming expert evidence to the contrary should justify a finding of negligence.

Public Health

Poliomyelitis

IN the week ended July 24, 39 cases were notified in England and Wales. In the weeks ended July 3, 10, and 17, notifications numbered respectively 36, 23, and 30.

Paratyphoid Fever at Eastbourne

Paratyphoid fever has been reported from Eastbourne, where up to last Monday 35 suspected cases had been found, of which 24 had been confirmed. Most of the patients are children; in all the illness began about the same time, suggesting a common source of infection. None is seriously ill.

In England Now

A Running Commentary by Peripatetic Correspondents

OUR Torch-bearer was due at the Cob Tree at 4.17 A.M., and we were lucky, because it was still dark. Much of the effect must be lost in daylight. Fred, who brought the torch 2½ miles from the next village to the pub at the bottom of our lane, is a local lad in the building trade. He qualified for this job by winning a special 8-mile race in the village sports. Why 8 miles I don't know; perhaps to allow for the 2 lb. weight of the Torch, the possibility of bad weather, and the lowered metabolism of 4 A.M. He finished the 8 miles with remarkable sangfroid, and we noticed the same on the great day, when he arrived, smiling happily, without a hair out of place, at our pub.

We had set the alarm clock for 3.50, but we were only just in time. As we came down the lane we saw a procession of car and bicycle lamps coming slowly along the main road. "It's him!" we cried, throwing grammar to the winds and breaking into a trot. It was Fred sure enough, preceded by an A.A. motor-cyclist, accompanied by bicyclists, and followed by a couple of motor coaches and a small string of private cars. There was no question which was the more out of breath—we after galloping a hundred yards downhill, or Fred after his long run.

Half the village had got up to greet him, including all those in the lower age-groups, and there was a sprinkling of strangers in cars. Everyone was talking at once, pressing round Fred, smacking him on the back, cracking jokes, demanding a light for cigarettes from the torch; one woman stood lighting them for people on the outskirts of the crowd. There was a little wait, because Fred had run his distance in under the allotted time; so all the children had a chance to hold the torch and read the inscription—"Olympia to London, with thanks to the Bearer," I think. In the end the next man emerged from one of the coaches, bald-headed and singlet-clad, with his unlit torch. While a photographer flashed his magnesium Fred formally handed on his flame, and we at last remembered to cheer when the new torch blazed up in fine style. Then, while Fred doused his torch in the saloon bar, aided by his admirers, the next man started off up the hill, and we watched his flame getting smaller among the trees until it passed round the bend. Within a couple of minutes it was light, and, like the audience emerging from a cinema, we noticed for the first time the details of our fellow-spectators; some of the aristocracy with cars were clad in variegated dressing-gowns, and there were some flowing nighties showing under overcoats.

"Well," said one of the fathers carrying a little boy on his shoulders, "if you live to be a hundred you won't see the Cob Tree open again at four in the morning."

* * *

Some years ago I noticed that one of the main differences between a specialist and a general practitioner was the thoroughness with which the specialist examined cases. Had the general practitioner been nearly as thorough, he could not have failed to have reached the correct diagnosis. There are other important points of difference, such as experience and training, but this question of thoroughness seemed to me fundamental; so I set out to become a specialist, and have now achieved that status. During the last few years I have served in the Army in various capacities, done locums in general practice, and had quite a wide experience of hospital outpatient departments, teaching and otherwise. Most of the errors I have seen committed by myself and others have been due to lack of thoroughness, but the remedy does not lie wholly in ourselves; the place where the patient is examined is also important. Proper examination is impossible in many surgeries, especially branch ones, and the conditions of work in many outpatient departments, with particular regard to noise and excessive numbers, are well known. If only many doctors had better facilities for examining patients the standard of medical practice would rise considerably. Let it be hoped that our planners will concentrate on providing conditions for thorough clinical examination before increasing the facilities for ancillary investigations such as X-ray and laboratory services, many of which might be rendered unnecessary by clinical thoroughness.

* * *

Why can't we use simple words like normal, all right, or nothing wrong, in our case-notes? It always has to be something like negative or N.A.D.—I would almost prefer O.K. Our American colleagues are even better—or worse—at this little game. The following summary may not have appeared in its entirety in any American hospital chart (case-record), but the terminology is genuine:

> This was the first gastro-enterology visit of this thirty-two-year-old married white female, looking her stated age, and in no apparent distress.
>
> *History:* She had a case of diarrhœa two weeks ago but has been asymptomatic since L.M.D. (local doctor) prescribed bismuth. Colitis of banal or ulcerative origin was suspected.
>
> *Examination:* Mouth: unremarkable. Teeth: in good repair. Pharynx: clear. Abdomen: non-contributory. Gastric analysis: physiological. X-ray work-up: no pathology. Other systems: benign.
>
> *Diagnosis:* ? Psychosomatic.
>
> ℞: Close case in gastro-enterology.
> Refer to psychiatry for opinion and treatment.

* * *

Opposite the big white modern hotel is the Savannah, a huge flat stretch, with its racecourse, playing-fields, and huge samman trees around its periphery, where the single-decked, open-sided trams run. Right across the Savannah are the Botanic Gardens. As I went in I was approached by a little Indian man, or as we call them in the West Indies, an *East* Indian. I thought I was going to be pestered to buy beaten "silver" bangles or "Luckies," but he announced himself as one of the gardeners and offered to show me round. When I told him I was a doctor he concentrated mainly on medicinal plants. I saw a large tree, with gum smelling of real friar's balsam oozing from its bark, *Myrospermum peruiferum*; a *Strychnos nux vomica* tree, with fruit the size of small oranges; a Coca plant (*Erythroxylon coca*), rather like a blackthorn bush, with vivid green tapering leaves and small red berries. "Over there," said my guide, "you get another tree that gives you dope—the kola nut. You get Coca-Cola from that." We came to a large tree with dark green foliage and big red pæony-like flowers stuck all over it. He sank his voice to a whisper: "This is the Venezuela mountain rose, most useful tree of all. You know when a woman gets a chill—the menstruation stops? Well, the flower of this tree brings it back again. One flower, one dose." I tried to look knowing too.

* * *

My daily maid turned up the other day all smiles and happiness. A long-forgotten relative in Australia had sent a food parcel, and she and her sister had enjoyed the first meal. The parcel had been badly knocked about and one cardboard box seemed to have no label. It contained a brownish powder, and since there were other packages of dried beef and the like they assumed the powder was some Australian kind of Bisto. So they sprinkled it on the dried beef and cooked it. They thought the flavour was fine. But the letter which arrived later produced nausea, anorexia, and other psychosomatic symptoms. It said they should take great care of the little brown box as Aunt Matilda had recently died and they were sending along a third share of the ashes.

* * *

I do not know where I am with my face, and my photograph is even worse. I admit to a slight myopathic *rire en travers* grafted on an acromegalic background, possibly also to a flabby fissured tongue and a touch of oxycephaly here and there; but the photograph gives me not only lid-lag, a depressed nasal bridge, and risus sardonicus, but complete baldness as well. Can one wonder therefore at my horror when I saw that I was expected to submit a photograph with my application for a recent job; can one wonder that I sent a portrait of Mr. James Mason instead; can one wonder that I was then immediately short-listed but was thrown out on the point of my oxycephalus when they saw me?

Letters to the Editor

BEDS FOR PULMONARY TUBERCULOSIS

SIR,—Dr. Bentley's article and the correspondence arising from it are most stimulating. Excluding the beds which a chest physician requires for observation and diagnostic investigations, and also the beds required for major thoracic surgery, the bed needs of two groups of patients must be clearly appreciated: those needing medical treatment, and those needing nursing care.

First there are patients who have some prospect of recovery, who require definite therapeutic procedures such as are usually carried out by physicians, and who ought to receive such treatment more or less as soon as a diagnosis of phthisis is established. The treatment of such cases often need not occupy a sanatorium or hospital bed for longer than about three months at a time, since many can follow a regimen of protracted rest in their own home, if they have learned the principles of bed rest in hospital.

During the last three years, in this town with a population of 110,000, and a tuberculosis death-rate of 60–70 per 100,000, the effective number of beds at my disposal has varied from about 15 to 25, and discrimination has been needed to use them to best advantage. It has been my policy to see that first and foremost, cases requiring medical treatment as distinct from nursing care do not forgo this on account of the nursing shortage; and therefore a candidate for collapse measures has always been admitted as soon as possible, to the exclusion of less hopeful more advanced cases. During the last couple of years such patients have been admitted after an average delay of a fortnight on the waiting-list.

The justification for this policy is illustrated by the short-term-sputum-conversion-rate of the 95 sputum-positive cases diagnosed in 1947: 22 of these patients were dead by the end of the year, and it is reasonable to assume that treatment would have been of little benefit to them. Of the remainder, however, by June, 1948, 40 had had appropriate collapse measures, sputum conversion being attained in 32 instances—i.e., 30% of the total infectious cases had become "safe" within a year. Their ultimate fate is undetermined, but suffice it for the present argument that their period of infectivity has been reduced and their prospects of recovery unhampered by delay in treatment.

What of the poignant cases left among their families? These are a great source of heartache and distress to all who seek to help them; but can the physician be blamed who avoids blocking beds with such cases? With inadequate facilities it is all the more important to make optimum use of such beds as remain. On humane grounds I admit that one occasionally has to relieve the home situation by admitting such a patient. Without debating the importance of segregation, I would argue, as many others have done, that if a bed can be used to achieve sputum conversion in several patients as against the segregation of one patient, there can be no question as to its more effective use.

Let us treat the treatable cases as speedily as possible in institutions, and arrange protracted spells of rest at the patient's home. Let institutional facilities aim at attaining sputum conversion as the immediate objective. Such a programme is scarcely practicable if waiting-lists are handled by a central administration, or even by the superintendent of an institution. The closest collaboration between the chest physician, who knows the waiting patient, and the superintendent, who knows his bed limitations, is necessary.

For less favourable cases, let everything possible be done to help the family with the care of the patient, by home domestic help, district nursing, boarding-out of children, and financial aid in every possible way; but let us not be misguided by our natural sympathy for these patients into allowing their nursing requirements to jeopardise another patient's prospects of recovery.

W. H. TATTERSALL
Chest Physician.

Chest Clinic, Reading.

OPERATIONS FOR HERNIA

SIR,—In his letter published in your issue of July 17, Professor Pannett raised a point of great interest to those who are concerned with the repair of large hernias. He suggests that unabsorbable sutures are of value in these repairs not because they remain unabsorbed but because they interfere less than catgut with the processes of repair.

There is little doubt that this is the case, but there is another aspect of the subject which should be brought to your notice: the ability of a lattice of unabsorbable material, anchored to healthy tissue at many points, to prevent stretching of young fibrous tissue. The distraction strains to which a recent hernial repair is submitted can thus be distributed diffusely over many different points; the amount of strain to which any individual point is subjected is thereby much reduced. No doubt eventually fibrous tissue will contribute the chief strength to the repair, but there is a good case for providing some form of inextensible support during the critical first six months.

Edinburgh. D. M. DOUGLAS.

SIR,—In his letter Professor Pannett made some adverse comments on a point of theory I advanced in the article on July 10 on the treatment of hernia by a darn of nylon.

I agree with Professor Pannett's generalisations on tissue repair, and also with the common observation that tight sutures cut through the tissues by pressure necrosis. Should he care to try the nylon darn type of repair I suggest he be sure to place the sutures without tension but with no slackness, to make them numerous, and to anchor them to sound surrounding tissues. The effect of this is to distribute a strong strain, when it comes, to many points and to curb it, as Gulliver was held by the threads of the Lilliputians. Unlike the continuous pressure of a tight suture, that of a suture in a darn is intermittent and the tissues do not necessarily undergo a process of necrosis in such circumstances. The same contrast is seen, on the one hand in a plaster sore due to continuous pressure, and on the other in the survival from intermittent pressure of the skin tube in a cineplastic amputation.

Professor Pannett's point about the tissues being alive is also commonly observed. Some fibrous reaction is bound to occur where and when they take strain. This fibrous tissue and the block of it formed to fill the mesh of the darn will deal adequately with many strains, but I believe that the darn itself is the factor which enables high strains of short duration to be contained successfully, repeatedly, and permanently. Fibrous tissue alone is fickle and liable to tear if not reinforced by a darn into structures strong enough to take high strain. Thus sepsis in catgut or fascial darns provides ample amounts of laudable fibrous tissue, but such cases are prone to early and late recurrence.

Though Professor Pannett finds the theory unacceptable, I hope he will condone it if he should try the nylon darn technique and find it giving satisfactory results.

Oxford. G. E. MOLONEY.

MEDICAL RECORDS

SIR,—The attention which some lay officers in hospitals are giving to the care of medical records is bringing to light difficulties that are removable. At a recent tuition course of the Hospital Record Officers Association held in Manchester the difficulty of finding a good medical stenographer was acknowledged. On the other hand, the stenographer's work would be aided, and the standard thereby improved, if the medical staff, and especially the younger generation, could dictate with fair ability. The basis of a good medical report is a thorough grasp of the information to be conveyed in it, and the capacity to express this in clear English. Medical records would certainly benefit if medical students were disciplined, as proposed by the B.M.A. medical curriculum committee, "in the proper meaning and use of words and the relationship of names and words to ideas and things."[1] The discussions during the course provided evidence that the absence of this ability has to be made good by the medical record officers. This dependence upon the lay staff, while testifying to their zeal and efficiency, seems in some cases to have reached a point where the main responsibility for the accuracy of records is placed upon the layman. In these medical record officers the medical staff may find valuable auxiliaries, but nothing will be gained by a confusion of functions. Distasteful as paper work may often be to the medical man, these records provide essential material for medical education and the efficient working of the National Health Service.

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[1] The Training of a Doctor. London, 1948; para. 56.

OBSERVER.

CHARMS

SIR,—One can but wholeheartedly agree with Dr. Dillon that psychology on a scientific basis ought to be our ideal, and we must all share fully his aversion to procedures resembling—or imitating—the methods of superstition. But we must admit the "metaphysical" aspect of the human personality: that is, the deep-rooted desire for the belief in the supernatural and unexplainable, for the ceremonial and magical. Whether we like this aspect of personality, or deplore it as atavism and superstition, we cannot afford to ignore it. In some people an approach on these lines—whether in the cause *of morality or health—promises better and* speedier results than the employment of logical and scientific concepts. In most people, indeed, this "metaphysical" aspect is strong, and may be stronger than the capacity for the "intelligible"; and in these the psychosomatic function responds better to magical than to scientific approaches. This has been abundantly illustrated by the appeal—and even therapeutic efficiency —of sacred wells, spiritual healings, and the less dignified activities of various quacks and therapeutic eccentrics. If we wish to be sincere we cannot ignore the large number of cures, where scientific medicine had previously failed, by these healers and methods. As a psychiatrist with twenty years' experience I find more people fit for magical methods than for modern psychotherapy. We may regret that this is so, especially since we average psychiatrists cannot perform such miracles; our training has made us unfit to use them, and our reputation as "scientific psychiatrists" inhibits the patient's belief in our magical powers. But I doubt whether any real harm is done by practitioners who feel able to apply them in selected cases. People helped by such primitive means may be more superstitious than intellectual, but they are not necessarily less happy or less reliable and humane. It is unlikely that pure science and logic will ever dominate human and social life. While regretting this, we must be content to fight prejudice and superstition where it is obviously antisocial, and tacitly accept the "metaphysical" aspect of the human personality where it brings advantages. I hope Dr. Dillon will forgive my spirit of compromise.

Harley Street, W.1. S. LOWY.

ATOMIC DEFENCE

SIR,—Your admirable summing up, on July 24, of the implications of accepting the inevitability of atomic warfare constitutes a challenge to medical men which is both urgent and grave.

It is clear that unless there is firm determination to grasp the opportunities which still exist to ensure the peace, we must abandon all our cherished hopes and plans for improving the health and wellbeing of the nation; for once we allow ourselves to accept the idea of war, all our energies must be bent to making what provision we can to limit the effects of the disaster. How little can be achieved by way of medical relief for the victims of atomic warfare, and at what enormous cost in organisation, manpower, and material, is clearly to be seen from the articles you quote.

But the choice which confronts us is not one between "making defence henceforward the chief end and aim of our existence" and neglect of the necessary measures of defence. Mercifully, the choice still lies between the path to war and a return to the path of peace. So long as such a choice exists—and time is short—surely the answer of our profession must be to take our stand for peace.

Pontyclun, Glam. JOHN B. ATKINS.

M.R.C.P. EXAMINATION

SIR,—I think the time has come for the Royal College of Physicians to devise a method of assessing the clinical acumen of candidates for the M.R.C.P. in some better and fairer way than at present. Everybody is aware that the "luck of the case" is practically 70% of the examination. There is an element of luck in every examination; and surely a time will soon come when examinations will be superseded by some other method of testing. Till then examinations are necessary.

In the membership examination the cases shown are varied in type. Some are quite simple, and some are made very simple by the kindliness of the patient; but others are complicated and bristle with difficulties, especially when the time allotted is hardly sufficient to take a history, examine all the systems, and do the necessary urine tests. No candidate sitting this examination will ever grudge getting a difficult case, but he will certainly have a grudge when his friend, who is perhaps *only* half prepared for the examination, gets away with it merely because of the simplicity of his cases or because he has heard about the cases from someone who has been asked to examine them the day before. The cases are often repeated from day to day and from examination to examination, though perhaps there is no remedy to this. But then why attach such importance to this qualification?

I suggest some better method of clinical testing should be devised. If the final pass percentage is 16%, about 60% of the candidates should be weeded out by stiff papers which should be corrected before the clinical examination; and the balance of 30% (which will amount to 180 if 600 enter) should be given a very searching clinical test. Several cases should be shown, and the censors should watch how the candidates tackle the cases. Of course, the same number of examiners and hospitals as at present should be utilised to enable this type of clinical examination to be conducted. The pruning to the required percentage could be done in this and the next two rounds.

M.R.C.P.

MOVEMENT OF THE DIAPHRAGM AFTER OPERATION

SIR,—Mr. Howkins says in his Hunterian lecture, published in your issue of July 17, that postoperative diaphragmatic inhibition does not necessarily occur on the same side as the abdominal incision, as found by Rees Jones.

An investigation which is now proceeding, tends to show that the postoperative pulmonary changes occur on the same side as the subdiaphragmatic air-bubble. The changes are usually most pronounced where the quantity of intraperitoneal air is large. The right hemidiaphragm being higher than the left is a reason for the air to collect on the right. Added to this, of course, is the fact that the majority of incisions are on the right. In midline gynæcological incisions the intraperitoneal air appears to be held under the omentum and in many cases does not reach the subdiaphragmatic area.

It is unfortunate that Mr. Howkins's X-ray plates have not been reproduced more clearly.

Charing Cross Hospital, London. ANGUS SMITH
Hon. Anæsthetist.

A TAX ON KNOWLEDGE

SIR,—I noted with interest the leading article in your issue of July 10. I have been carrying on a correspondence with the Departmental Claims Branch on this subject since April, though I am still not clear on some points.

I find that the British Medical Association library is unable to supply quite a proportion of the original literature that I require, and I wished to apply for fellowship of the Royal Society of Medicine. I did not consider, however, that I could really afford yet another subscription, and I therefore inquired as to the possibility of claiming for this and various other subscriptions—e.g., to *The Lancet, British Medical Journal*, and Lewis's Library. Mr. Justice Rowlatt's judgment makes it clear that these are not admissible under the present wording of Schedule E. From the wording of Schedule D, however, I take it that they are admissible for civilian practitioners. This is surely an unjustifiable anomaly and one which every effort should be made to alter. Although it is not essential to subscribe to various journals in order to obtain or retain one's commission, it *is* essential to subscribe in order to keep reasonably up to date, which any self-respecting doctor must do. Moreover, in many appointments in the Services, as in my present one, there is comparative professional isolation, the stimulating effect of discussion with colleagues is sadly missed, and it is more than ever necessary to attempt to redress the balance with additional reading.

I hope that you will not allow this matter to rest.

SURGEON LIEUTENANT.

CARS FOR DOCTORS

SIR,—The present unsatisfactory situation in respect of doctors' cars can well be illustrated by my own case.

To save myself five hours' daily in buses, I bought a pre-war car early this summer at an inflated price, having had it expertly examined first. However, it is an old car and the parts are inevitably worn; so far I have had to replace the crown wheel and pinion, the front springs, and the battery, as well as many smaller repairs over three months. It is more than I can afford, but there is no alternative.

I live in a wealthy area where new cars are commoner on the roads than old ones, and I often wonder how the priority system makes this possible. The other day I went to view another second-hand car which the owner was selling, having just acquired a new Austin A 40 Devon Saloon—the very car I have on order with a B.M.A. priority. The man explained that he had no priority, being an ordinary business-man, but that he had waited "a long time—over 18 months."

INDIGNANT.

EMETINE FOR VARIOUS INFECTIONS

SIR,—Emetine has long been known as an effective agent for amœbic abscess of the liver. It has also been used for pulmonary abscesses; and where improvement has been achieved, this has been accepted as proof of an amœbic origin. But I found that emetine can also be very effective against non-amœbic liver abscesses, and this led me to try it against many other septic infections. My results, of which only a small part has hitherto been published,[1] have been very satisfactory and often rather surprising.

In each of 9 cases of virulent furuncle of the lip, most of them very severe, which were treated with emetine, prompt recovery ensued. In 4 cases of traumatic purulent meningitis the cerebrospinal fluid became sterile after a few days' treatment; 3 cases were definitely cured, while 1 died six weeks afterwards in consequence of a brain abscess. All of 20 cases of severe biliary infection responded to emetine; in some no other treatment was used, while in others surgical treatment had been undertaken and had proved insufficient. In many cases of severe purulent peritonitis (mostly of appendicular or traumatic origin) and of gaseous gangrene, and in some cases of brain abscess, very good results were obtained.

Emetine is sometimes highly effective against infections due to penicillin-resistant organisms—notably, *Bact. coli* and *Pseudomonas pyocyanea*—particularly where penicillin cannot be applied directly or when its action is impeded by thick abscess membrane or much necrotic tissue.[2]

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Surgical Clinic of the Nümune Hastanesi, Ankara.

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British Medical Association,
Tavistock Square, London, W.C.1.

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15, North Portland Street,
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Parliament

Rural Water-supplies

In the House of Commons on July 27 Mr. JOHN DWARDS, parliamentary secretary to the Ministry of ealth, said that the Government would have to consider hat further provision for rural water-supplies should made when the £15 million voted for grants in 1944 as exhausted. He did not think that it would prove iough. The Government had put forward a great fort to improve rural water-supplies, and local thorities had been encouraged to submit schemes, d the estimated cost of such proposals submitted to ie Ministry exceeded £35 million. Permission for ork to start had been given to schemes costing about 5 million. In addition, schemes to a total of about 3 million had been approved in principle, and the overnment had promised grants under the 1944 Act r schemes costing nearly £9 million.

Parliament adjourned on July 30 for the summer cess until Sept. 13.

The Royal Assent was given to the Veterinary Surgeons ct, the Nurseries and Child-minders Regulation Act, he Factories Act, the Criminal Justice Act, and the tatute Law Revision Act.

QUESTION TIME

Hospital Accommodation for Private Patients

Mr. G. M. SHARP asked the Minister of Health what structions he had given to regional hospital boards about he amount of hospital accommodation which might be served for doctors' private patients; who decided to which atients this should be allocated; how the charges made ould be determined; and for what purposes the receipts ould be used.—Mr. ANEURIN BEVAN replied: As an interim neasure, I have approved the continued use for this purpose f any accommodation so used immediately before the ppointed day until regional boards can review the position nd draw up considered proposals. The hospital manage-ment committee concerned is responsible for the admission rrangements. Hospital charges will be determined by that ommittee in accordance with the National Health Service Pay-bed Accommodation in Hospitals, &c.) Regulations,[1] hich also prescribe maximum fees recoverable by the medical ractitioner for professional services. The receipts from ospital charges will be paid into the Exchequer.

Employment of Assistants under N.H.S.

Sir ERNEST GRAHAM-LITTLE asked the Minister whether e was aware of hardship to many doctors resulting from the hange-over in health services; and whether he would make an interim regulation allowing those doctors who had employed assistants for a minimum period of six months prior to July 5 to continue to employ them as of right for a further period of six months under the terms set out in the Minister's circular dealing with the remuneration of general practitioners.—Mr. BEVAN replied: Executive councils have been asked to consent without question to the continued employment in the National Health Service of assistants employed before the appointed day. The remuneration of such assistants is a matter for their principals. The arrangements for grants for training assistants without previous experience are under discussion with the profession.

Excessive Prescribing

Mr. H. E. RANDALL asked the Minister of Health if he was aware that the regulations issued in connexion with the National Health Service concerning the procedure to be adopted for he investigation of excessive prescribing had created considerable feeling among the medical profession, and whether he ould give an assurance that, whilst such procedure might e necessary to prevent extravagance, it would not be used to estrict the doctors.—Mr. BEVAN replied: This procedure is on similar lines to that which has been in operation for many years under the old National Health Insurance Scheme. It is aimed exclusively at extravagant prescribing and will certainly not be used to restrict any prescribing necessary for the treatment of the patient.

Sir THOMAS MOORE asked the Minister what authority had been delegated to local medical committees to prevent a medical practitioner from prescribing any drug or medicine which he considered necessary for the treatment of an insured patient.—Mr. BEVAN replied: I should like it to be quite clear that patients are entitled to all drugs necessary for their proper treatment. Local medical committees have only power to investigate excessive prescribing.

Remuneration of Junior Specialists

Sir ERNEST GRAHAM-LITTLE asked the Minister whether he was aware that a large class of younger specialists, including holders of grants under the various grades of the health scheme, had not been offered even interim contracts under the Act, and that they were receiving approximately half the salary which they might expect from the Spens report recommendations, and as many of them, as in an example submitted, had been qualified 10 years, were married, had families and were suffering from financial strain, whether he would give an assurance to them that the adjustments would be retrospective and would be made quickly.—Mr. BEVAN replied: No interim contracts are necessary where, as was usual, holders of junior hospital appointments immediately before July 5 were whole-time officers, because they passed as transferred officers automatically into the employment of the appropriate hospital management committee or board of governors. Any adjustment of their present remuneration (which, I am aware, is often less than that recommended by the Spens Committee) must await the drawing up of agreed rates with the profession, as in the case of specialists; as soon as agreed rates are evolved I shall do my best to see that retrospective adjustments from July 5 are carried out quickly.

Distribution of Hearing-aids

Mr. ELLIS SMITH asked the Minister when the Medresco hearing-aid would be available for all who required it; and if he would give an assurance that supplies, as they became available, would be distributed evenly between all industrial centres.—Mr. BEVAN replied: I cannot foretell the exact date on which every patient who would benefit from a hearing-aid will be able to obtain one. The number of distribution centres will, however, as the supply position improves, be steadily increased until there is one reasonably accessible in every part of the country.

Lieut.-Colonel MARCUS LIPTON asked how many of the Government's deaf-aid appliances had been manufactured and issued.—Mr. BEVAN replied: 1680 Medresco aids had been delivered from the manufacturers up to July 26, and 1200 had been issued in hospitals in England and Wales.

Spa Treatment

Sir WALDRON SMITHERS asked the Minister of Health if, in view of the resignation of Dr. Mackenna of Droitwich, he would make a statement as to spa treatment under National Health Service.—Mr. BEVAN replied: I think the doctor may have been under a misapprehension. For patients of the appropriate hospitals in the National Health Service requiring treatment of the spa type, it is open to a regional hospital board to arrange for convenient facilities for this treatment to be used, at the discretion of the medical staff of the hospital, to supplement the hospital's own resources. It is not a responsibility of the hospital service to provide treatment at spa establishments otherwise than in this way.

Financial Interest in Patent Medicines

Mr. PETER FREEMAN asked the Minister whether his regulations allowed doctors or dentists employed in the National Health Service to hold financial interests in patent medicines or other proprietary articles of a medical nature.—Mr. BEVAN replied: There is no power in the National Health Service Act to make regulations on this point.

Hearing-aids

Sir ROBERT YOUNG asked the Minister whether, during the shortage of supply of hearing-aids to those prescribed them, there would be any system of priority laid down for men and women employed in essential industries when their impairment would cause an otherwise unnecessary withdrawal of practitioners. This is surely an unjustifiable anomaly and one which every effort should be made to alter. Although it is not essential to subscribe to various journals in order to obtain or retain one's commission, it *is* essential to subscribe in order to keep reasonably *up to date, which any self-respecting doctor must do.* Moreover, in many appointments in the Services, as in my present one, there is comparative professional isolation, the stimulating effect of discussion with colleagues is sadly missed, and it is more than ever necessary to attempt to redress the balance with additional reading.

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[1] *Lancet*, July 31, p. 193.

I hope that you will not allow this matter to rest.

SURGEON LIEUTENANT.

CARS FOR DOCTORS

SIR,—The present unsatisfactory situation in respect of doctors' cars can well be illustrated by my own case.

To save myself five hours' daily in buses, I bought a pre-war car early this summer at an inflated price, having had it expertly examined first. However, it is an old car and the parts are inevitably worn; so far I have had to replace the crown wheel and pinion, the front springs, and the battery, as well as many smaller repairs over three months. It is more than I can afford, but there is no alternative.

I *live in a wealthy area where new cars are commoner on* the roads than old ones, and I often wonder how the priority system makes this possible. The other day I went to view another second-hand car which the owner was selling, having just acquired a new Austin A 40 Devon Saloon—the very car I have on order with a B.M.A. priority. The man explained that he had no priority, being an ordinary businessman, but that he had waited "a long time—over 18 months."

INDIGNANT.

EMETINE FOR VARIOUS INFECTIONS

SIR,—Emetine has long been known as an effective agent for amœbic abscess of the liver. It has also been used for pulmonary abscesses; and where improvement has been achieved, this has been accepted as proof of an amœbic origin. But I found that emetine can also be very effective against non-amœbic liver abscesses, and this led me to try it against many other septic infections. My results, of which only a small part has hitherto been published,[1] have been very satisfactory and often rather surprising.

In each of 9 cases of virulent furuncle of the lip, most of them very severe, which were treated with emetine, prompt recovery ensued. In 4 cases of traumatic purulent meningitis the cerebrospinal fluid became sterile after a few days' treatment; 3 cases were definitely cured, while 1 died six weeks afterwards in consequence of a brain abscess. All of 20 cases of severe biliary infection responded to emetine; in some no other treatment was used, while in others surgical treatment had been undertaken and had proved insufficient. In many cases of severe purulent peritonitis (mostly of appendicular or traumatic origin) and of gaseous gangrene, and in some cases of brain abscess, very good results were obtained.

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Notes and News

REPRESENTATION OF SPECIALISTS

A CONFERENCE of representatives of the Royal Colleges, two of the Royal Scottish Corporations, and the British Medical Association was held at the Royal College of Surgeons on July 28, to discuss the general question of the organisation to represent consultants in the future. Sir Lionel Whitby, president of the British Medical Association, presided. After discussion it was decided to submit to the bodies invited to the conference the following propositions:

(i) That a Joint Committee of the Royal Colleges, the Royal Scottish Corporations and the British Medical Association be established to advise the Minister of Health on all matters concerning consultants and specialists.

(ii) That the existing Committee of the Colleges and Corporations, and the Central Consultants and Specialists Committee established by the British Medical Association, continue in existence to brief the Joint Committee.

(iii) That the Joint Committee be requested to allocate, as soon as practicable, fields in which their constituent bodies are free to take independent action and to deal with governmental bodies direct.

It was agreed to establish an exploratory committee of nine members with Sir Lionel Whitby as chairman.

University of Oxford

At a convocation on July 21, the honorary degree of D.C.L. was conferred on Sir Arcot Lakshmanaswami Mudaliar, F.R.C.O.G., vice-chancellor of the University of Madras.

Dr. D. S. Hayton-Williams has passed the examination for B.A. (honours jurisprudence).

University of Cambridge

On July 26 a doctorate of law was conferred on Dr. T. B. Davie, who has lately been appointed vice-chancellor of the University of Cape Town.

The Copeman medal for medical or biological research has been awarded to Dr. David Vérel.

University of London

Dr. E. P. Sharpey-Schafer has been appointed to the chair of medicine at St. Thomas's Hospital medical school, from Oct. 1.

Mr. D. S. Bertram, PH.D., has been appointed to the readership in entomology at the London School of Hygiene and Tropical Medicine, and Mr. F. L. Warren, D.SC., to the readership in biochemistry at University College.

The title of professor emeritus has been conferred on Dr. A. B. Appleton and Dr. O. L. V. de Wesselow, on their retirement from the chairs of anatomy and medicine at St. Thomas's Hospital medical school; on Dr. D. T. Harris on his retirement from the chair of physiology at the London Hospital medical college; and on Dr. T. Baillie Johnston on his retirement from the chair of anatomy at Guy's Hospital medical school.

University of St. Andrews

Dr. R. B. Hunter has been appointed to the chair of materia medica in succession to Prof. F. J. Charteris.

Dr. Hunter graduated M.B. in 1938 at Edinburgh University, where he was president of the Royal Medical Society. Later he held house-appointments and a clinical tutorship at the Edinburgh Royal Infirmary. During the war, while serving in the R.A.M.C. with the rank of major, he acted as personal physician to Field-Marshal Montgomery; and he was appointed M.B.E. Since his return to Edinburgh he has become lecturer in therapeutics in the university and assistant director of the Edinburgh Post-Graduate Board for Medicine. He has published papers on the clinical use of anti-histamine substances.

Royal College of Physicians of London

At a comitia held on July 29, with Lord Moran, the president, in the chair, the following fellows were elected officers for the ensuing year:

Censors: Dr. Donald Hunter, Prof. J. Crighton Bramwell, Dr. J. Forest Smith, Prof. R. V. Christie. *Treasurer:* Prof. W. G. Barnard. *Registrar:* Dr. H. E. A. Boldero. *Harveian Librarian:* Dr. Archibald Gilpin. *Assistant Registrar:* Dr. W. D. W. Brooks. *Members of the library committee:* Dr. Macdonald Critchley, Dr. J. Bishop Harman, Dr. M. L. Rosenheim, Dr. R. R. Bomford. *Finance committee:* Dr. J. St. C. Elkington, Dr. G. B. Mitchell-Heggs, Dr. C. T. Potter.

The following were elected examiners:

Chemistry: Mr. Alexander Lawson, PH.D., Mr. John Lowndes, F.I.C. *Physics:* Mr. Stanley Rowlands, PH.D., Mr. J. E. Roberts, PH.D. *Materia medica and pharmacology:* Prof. E. J. Wayne, Dr. E. F. Scowen, Dr. Wilfred Oakley, Dr. J. Bishop Harman, Prof. A. C. Frazer, Dr. V. J. Woolley. *Physiology:* Prof. W. R. Spurrell, Prof. J. L. D'Silva. *Anatomy:* Prof. Thomas Nicol. *Pathology:* Prof. R. J. Pulvertaft, Dr. Archibald Gilpin, Prof. W. D. Newcomb, Dr. Kenneth Robson. *Medical anatomy and principles and practice of medicine:* Dr. A. H. Douthwaite, Dr. L. B. Cole, Dr. J. L. Livingstone, Dr. K. Shirley Smith, C. B. Levick, Dr. T. C. Hunt, Dr. Robert Coope, Dr. H. L. Marriott, Dr. Horace Evans, Dr. J. C. Hawksley, Dr. F. P. Lee Lander, Dr. William Brockbank. *Midwifery and diseases peculiar to women:* Mr. D. H. Macleod, Mr. H. L. Shepherd, Mr. R. A. Brews, Mr. J. E. Stacey, Mr. G. F. Gibberd. *Public health:* part I, Prof. J. M. Mackintosh, Prof. M. E. Delafield; part II, Dr. John Greenwood Wilson. *Tropical medicine:* section A, Major-General Sir Alexander Biggam; section B, Dr. George Macdonald. *Ophthalmic medicine and surgery:* Dr. E. A. Blake Pritchard. *Psychological medicine:* part I, Dr. W. D. Nicol; part II, Prof. P. C. P. Cloake, Dr. Noel Harris. *Laryngology and otology:* Mr. M. L. Formby. *Medical radiology:* Prof. Gilbert Stead, D.SC., Dr. Peter Kerley, Prof. D. W. Smithers. *Anaesthetics:* Dr. Kenneth Robson, Dr. C. A. Keele, Dr. A. D. Marston, Dr. B. R. M. Johnson. *Child health:* Dr. Kenneth Tallerman, Dr. A. G. Watkins. *Physical medicine:* part I, Dr. J. W. Litchfield, Prof. W. V. Mayneord, D.SC.; part II, Dr. W. S. C. Copeman, Dr. D. C. Shields. *Industrial health:* part I, Dr. J. A. Charles; part II, Prof. R. E. Lane.

The following lecturers were appointed:

Dr. Geoffrey Marshall (Harveian orator), Dr. J. G. Scadding (Bradshaw), Dr. A. P. Thomson (Lumleian), Dr. C. Gavey (Goulstonian), Prof. H. P. Himsworth (Oliver-Sharpey), Dr. N. B. Capon (Charles West), Dr. J. H. Sheldon (F. E. Williams), Dr. Donald Hunter (Ernestine Henry)—all for 1949; and Dr. A. E. Clark-Kennedy (Croonian) for 1950.

The Murchison scholarship, held this year in London, was awarded to Dr. Mary Holt. The Moxon medal was awarded to Dr. N. Hamilton Fairley, F.R.S., for his work on blood-pigments and malaria, and the Weber-Parkes prize to Dr. S. Roodhouse Gloyne for his work on the morbid anatomy of pulmonary tuberculosis and its differentiation from diseases due to dust.

The following, having satisfied the censors' board, were elected to the membership:

Z. H. Abdeen, M.B. Cairo, J. C. L. Adams, M.B. Lond., A. K. S. Ahmed, M.B. Calcutta, Andrew Allison, M.B. Glasg., R. P. Aronson, M.B. Lond., D. V. Bates, M.B. Camb., J. M. Beare, M.D. Belf., T. P. Blanshard, M.D. Lond., A. W. Branwood, M.D. Edin., F. S. W. Brimblecombe, M.B. Lond., K. P. Brown, M.B. Lond., major R.A.M.C., G. N. Chandler, B.M. Oxfd, M. V. Chari, M.B. Rangoon, E. K. Cruickshank, M.B. Aberd., Marc Daniels, M.D. Paris, Stanley Davis, M.B. Lond., flight-lieutenant R.A.F., G. K. Dhariwal, M.B. Punjab, R. S. Duff, M.B. Glasg., P. R. Duncan, M.B. Manc., J. H. Ebbs, M.D. Birm. and Toronto, M. M. El-Mehairy, M.B. Cairo, N. B. Finter, M.B. Camb., C. D. Garratt, M.B. Lond., D. H. Garrow, B.M. Oxfd, I. C. Gilliland, M.B. Edin., Boris Golberg, M.B. Witwatersrand, Helen C. Grant, M.B. Lond., G. S. Gray, M.B. Durh., Thomas Hanley, M.B. Lond., Audrey Hanson, M.B. Lond., J. F. J. Hickey, M.B. N.U.I., C. K. Hirson, L.R.C.P., G. E. Honey, B.M. Oxfd, D. A. Howell, L.R.C.P., Philip Jacobs, M.B. Brist., Leslie Jacobson, M.B. Cape Town, B. A. G. Jenkins, M.B. Lond., J. H. P. Johnson, M.B. Calcutta, J. G. P. Jones, M.B. Lpool, Refai R. M. Kamel, M.D. Cairo, J. A. Keeling, M.B. N.Z., S. E. Keidan, M.B. Lpool, W. L. R. Kenyon, M.B. Manc., Israel Kessel, M.B. Witwatersrand, J. A. Kilpatrick, M.B. N.Z., S. G. E. Laverty, M.B. Edin., C. W. Lawson, M.B. Sheff., Theresa Lazar, M.B. Birm., R. F. L. Logan, M.D. Belf., Solly Lopis, M.D. Witwatersrand, E. M. Lourie, M.B. Lond., J. MacW. MacGregor, M.R.C.P.E., A. G. McManis, M.B. Sydney, W. B. D. Maile, M.D. Camb., B. M. Mandelbrote, M.B. Cape Town, John Marshall, M.B. Manc., M. M. Martin, M.B. Durh., Robert Martlew, M.B. Camb., W. J. Matheson, M.B. Edin., Edith M. Metcalfe, M.B. Camb., R. G. Miller, M.B. Camb., George Monckton, M.B. Lond., P. D. Moss, M.B. Lpool, Richard Mulcahy, M.B., N.U.I., L. A. M. B. Musso, M.B. Sydney, T. E. Oppe, M.B. Lond., J. S. Pegum, M.B. Camb., J. S. Prichard, M.B. Camb., A. W. S. Ritchie, M.B. N.Z., William Robinson, M.D. Leeds, W. J. B. Rogers, M.B. Camb., Alexander Russell, M.B. Durh., J. B. G. Russell, M.B. Aberd., A. Z. Shafei, M.B. Cairo, R. A. Shanks, M.B. Glasg., Norman Shapiro, M.B. Cape Town, Daniel Sheehan, M.D. N.U.I., J. P. Shillingford, M.D. Harvard, M.B. Lond., Wilfred Sircus, M.B. Lpool, T. G. Smillie, M.B. Glasg., F. R. Staub, M.D. Leeds, P. V. Suckling, M.B. Lond., J. M. Swithinbank, M.D. Lpool, Mary Townsend, M.B. Lond., L. H. Truelove, B.M. Oxfd, D. H. Turnbull, M.B. Durh., Samuel Vaisrub, M.D. Manitoba, D. D. Vora, M.D. Bombay, Betty Walker, M.B. Lond., J. B. Walter, M.B. Lond., G. M. Watson, M.B. Adelaide, J. M. Watt, M.B. N.Z., G. H. Wattley, M.B. Brist., Robert Wigglesworth, M.B. Lond., O. G. Williams, M.B. Lond., R. B. N. Wilsdon, M.B. Lond., S. R. Wood, M.B. Birm.

Licences to practise and diplomas were conferred on those named in the reports of the Royal College of Surgeons below and in our issues of July 17 (p. 128) and June 18 (p. 971).

Register of Orthoptists

The 1948 edition of this register, published by the Board of Registration of Medical Auxiliaries, is now obtainable, without charge, from the registrar of the board, Tavistock House North, Tavistock Square, London, W.C.1.

their labour.—Mr. BEVAN replied : Otologists are being asked *to give priority to the most deaf patients and those who are* seriously handicapped in their work for lack of an aid.

Venereal Disease

Mr. R. W. SORENSEN asked the Minister of Health why the statutory protection of secrecy had been withdrawn from persons attending V.D. clinics under the new National Health Service Act.—Mr. BEVAN replied : The withdrawal results from the revoking of the Public Health (Venereal Diseases) Regulations now that responsibility is transferred to regional hospital boards. But I would emphasise that treatment for venereal disease will continue to be as confidential as it always has been.

Supplies of T.T. Milk

Mr. PHILIP PIRATIN asked the Minister of Food to what extent tuberculin-tested milk not bottled by the farmer was subsequently kept separate by the bottles and sold as T.T. ; and what steps he took to ensure that such milk was not mixed with non-T.T. milk.—Dr. EDITH SUMMERSKILL replied : In May, 1948, approximately 27% of the T.T. milk sold by producer-wholesalers in England and Wales was retailed as such. Under the Milk (Special Designations) Regulations T.T. milk sold as such must be kept separate from all other milk and sold to the consumer in sealed containers specially labelled and fitted with overlapping caps. Failure to comply with these conditions may involve dairymen in the revocation or suspension of their licences to sell T.T. milk.

Mr. PIRATIN : Is it not the case that a certain amount of T.T milk is not sold as T.T. milk at all, and is therefore wasted so far as the quality is concerned, since it is mixed with ordinary milk before being sold ? T.T. milk should be sold as such, because there is a wide demand for it.—Dr. SUMMERSKILL : Unfortunately the hon. gentleman is wrong. I wish there were a wide demand for it. Only 27% is sold as T.T. milk. We cannot govern consumer preference.

Hygiene in the Food Trades

Dr. SANTO JEGER asked the Minister of Food if he had considered the reports of the proceedings at the congress of the Royal Sanitary Institute and at the annual conference of the Sanitary Inspectors Association, attended by his officials, at which the need for a campaign to improve the standards of hygiene in the food trades was urged ; and whether he would make a statement.—Mr. J. STRACHEY replied : Yes, I have seen the reports. Under the Transfer of Functions (Food and Drugs) Order, 1948, which came into operation on March 1, and the several Public Health (Amendment) Regulations which came into operation on June 1, my department has taken over from the Ministry of Health the central responsibility for food inspection and food hygiene generally. It is my intention to seek the coöperation of local authorities and their officers, the food trade, and the public in a concerted effort to combat the dangers to health which result from the preparation, storage, or handling of food in unclean or otherwise unsatisfactory conditions. Unfortunately, shortage of essential equipment and of building labour and materials hamper immediate improvements in many directions. I believe, however, that existing legislation can be made more effective by voluntary and more detailed codes of practice applicable to particular trades, and by stimulating amongst all concerned a more positive attitude to food hygiene generally. In these matters my department will work in close consultation with the Ministry of Health, which remains responsible for measures for dealing with infected food and food-poisoning, and with the local authorities concerned with the enforcement of the relevant provisions of the Food and Drugs Act, 1938, and of the regulations made thereunder. I feel sure that I can rely upon all concerned—and not least the general public—to give their wholehearted support to this effort.

Scholarships for Medical Students

Mr. SOMERVILLE HASTINGS asked the Minister of Education what percentage of those now undergoing training as medical students in England and Wales were in receipt of maintenance scholarships from the Government and how these compared with pre-war figures.—Mr. GEORGE TOMLINSON replied : As stated by the Chancellor of the Exchequer on July 13 last, 2840 medical students out of a total of 9671 at universities in England and Wales are assisted with State awards. The number of medical students in 1937–38 was 8623 and the number holding State scholarships was 29.

Imports of Technical Publications

Replying to Mr. T. E. N. DRIBERG Mr. H. WILSON, presid of the Board of Trade, said that a further notice had bee sent to importers which amended the department's memora dum no. 281 of March 17 last. This new notice gave eff to the arrangements under which any person might for himself or on behalf of others single postal copies learned, scientific, technical, and religious periodicals print exclusively in a foreign language.

Treatment for Sexual Offenders

Mr. HECTOR HUGHES asked the Home Secretary if h attention had been drawn to the case of which details h been sent to him of a man of 82 described by the police as pest, against whom many complaints of interference wi young children had been made, who in East London w convicted of assault on a 4-year-old girl, and sent to pris for one month ; and what therapeutic treatment was provid in prison for this and similar cases.—Mr. CHUTER EDE replie I have obtained particulars about this conviction. Treatme is provided in prison in cases where it is likely to be of benef but it would be useless to attempt such treatment in th case in view of the age of the prisoner and the shortness his sentence.

Obituary

ISAIAH MORRIS

M.C., M.R.C.S., D.C.H.

Dr. Isaiah Morris was killed in Gallilee on June while commanding an Israeli medical unit. He w 30 years of age. Born in Glasgow, the youngest son Dr. Nathan Morris, he received his early education that city. He studied medicine at University Colleg Hospital, qualifying in 1942. During the invasion Europe he was awarded the Military Cross while servi as regimental medical officer to the 1st Suffolks. worked in England for over a year after his demobilis tion, and in November last he left for France, where worked for some months in camps for displaced perso For many years he had wished to practice as a childre doctor in Palestine, and he eventually reached th country this year.

" Isaiah Morris," writes a colleague, " was outstandi among his generation for the intensity with which thought and acted, and for the clear light of princi which guided him. He was naturally friendly ; gaiety and lightness of heart attracted people to him, they found a spirit of unbounded generosity and de humanity. He was a delightful colleague and co panion ; he had many friends, on whom his influe was profound. He set himself the highest standards life, and he lived up to them, selflessly devoting hims to the cause of the relief of suffering. He died as would have chosen to die, serving humanity among own people, where service was most needed."

Births, Marriages, and Deaths

BIRTHS

BRYCE-SMITH.—On July 26, at Oxford, the wife of Dr. Ro Bryce-Smith—a daughter.

GEAKE.—On July 24, at Woking, the wife of Dr. M. R. Ge —a son.

HALL-SMITH.—On July 21, at Hove, to Dr. Angela Hall-Smith Dr. Patrick Hall-Smith—a son.

OLLERENSHAW.—On July 28, at Cardiff, the wife of Dr. A. Ollerenshaw—a daughter.

SMITH.—On July 25, at Norwich, the wife of Dr. E. S. Or Smith—a son.

MARRIAGES

CORY—HORREX.—On July 28, at Woodbridge, R. F. P. Cory, c surgeon rear-admiral, R.N., retd., to Kathleen Horrex.

FITZPATRICK—TRAVERS.—On July 10, at Yelling, Hunts, J. Fitzpatrick, surgeon commander, R.N., to Eva Dionys

DEATHS

CASTELLAIN.—On July 23, Herménégild George Pourtalès Caste M.A. Oxfd, M.A., M.D. Camb.

DAVIES.—On July 29, at Colwyn Bay, Hugh Collin Davies, Glasg.

DICKSON.—On July 25, at Thames Ditton, Surrey, William A Dickson, M.D. St. And., M.R.C.P., F.R.C.S.E., D.P.H.

McIVER.—On July 24, Colin McIver, M.D. Edin., D.P.H., lt colonel, I.M.S. retd.

AFTERCARE OF THE AGED SICK

E. N. Thomson
M.B. Glasg.

M. Curran
M.B. Glasg., D.P.H.

> inquiries here, there and everywhere, but with meagre results . . ."
> *The Bishop of Truro, speaking of reports on old age in the* House of Lords, 1947.

At present patients are discharged from hospital and gotten until they become ill again. This may be isfactory with the ordinary adult, but in the elderly ime aftercare and general supervision are necessary. e have tried to find out just how necessary such help , and how it can best be applied; and to discover if e treatment in hospital has had results comparable ith those achieved in younger patients.

From the records of two Glasgow municipal hospitals e abstracted particulars of those men over 65 years of ge and women over 60 who had been discharged or ad died (technical discharge) during the winter months rom October, 1946, to March, 1947, inclusive. Between hese dates there were 757 discharges classified as follows:

A, Cardiovascular diseases
B, Pulmonary diseases
C, Alimentary tract diseases
D, Urinary tract diseases
E, Psychological disorders
F, Other conditions.

The hospitals concerned treat conditions of all types; hence every kind of illness is included in the survey. Where the disease was given in the record card as "senility" it was put into class F.

Of the 757 cases 201 were cardiovascular and only 91 pulmonary. One would have expected that, in a smoky city atmosphere, the pulmonary conditions would have been at least as common as the cardiovascular; but, with the rising tempo of industrial life, cardiovascular disease is assuming an increasingly serious position in the later years of life. Indeed, many cases diagnosed as bronchitis in the elderly are really slight pulmonary œdema resulting from a failing heart. Some physicians consider that a few râles in the lungs of those over 70 are to be expected as a normal concomitant of age. We cannot endorse this opinion. In healthy elderly persons we have found no such adventitious sounds.

Those discharged after treatment for cardiac conditions showed a great fear of doing anything that might put a "strain on their heart." They had nothing to think about all day except themselves, and they carried their worries to excess. Leading over-careful sedentary lives, they became more morbidly introspective than those who had been in hospital for other reasons. It is particularly in this type of case that something is required to take up their time and attention, and we thought that in twenty of these cardiovascular patients some therapeutic occupation could have been carried on with advantage. We prefer the term "therapeutic occupation" to the usual "occupational therapy," because the occupation is the dominant factor therapeutically, socially, and economically. Knitting, with the prospects of some financial reward to the old ladies, would be ideal for these heart cases if wool could be easily obtained.

One old lady had regular clients for dish-cloths made from string and sold for a few pence each. She was 78 years old and had been in hospital with auricular fibrillation.

Another lady, 84 years old, though almost blind made a happy time and a reasonable profit for herself by knitting men's socks from wool supplied by her customers.

One man cut ornamental spoons and letter-openers from odd pieces of wood; he gave away his products free, but we estimate that at today's values he could have made a profit of 1s. 6d. on each article.

These three people were among the most cheerful whom we visited, and they were pleased, like children, about the attention which their activities attracted; they showed no undue worry about their heart condition, and will probably outlive comparable people without a similar occupation. We believe that an elderly person who occupies himself with a hobby within his range of mental and physical power, especially one which he really enjoys, will not only live longer but also will have a lower sickness-rate than his opposite number who vegetates on his retirement; further, the satisfied cheerful elderly person contributes to the community an intangible something which reflects itself in the lives and work of those about them.

DEATHS IN HOSPITAL AND TRANSFERS

	Classification						
	A	*B*	*C*	*D*	*E*	*F*	*Total*
Died in hospital ..	106	23	23	19	6	40	217
Transferred to other hospitals	..	..	..	..	13	5	18
Transferred to public-assistance institutions	8	1	..	1	3	9	22
Total ..	114	24	23	20	22	54	257

In the six months under review 217 of the people in the chosen age-group had died, 18 had been transferred to other hospitals, and 22 had gone to public-assistance institutions. Cardiovascular disease accounted for about half of these deaths (106), and only 23 were in the pulmonary group. But in the latter four deaths from pulmonary tuberculosis are a reminder that tuberculosis as a lethal disease is not confined to the earlier half of life. These tuberculous patients were admitted with a diagnosis of bronchitis and, owing to lack of accommodation in the sanatoria and to impossible home conditions, had to be retained on humanitarian grounds in the general hospital. Duration in hospital varied from day of admission to 2476 days. Within 24 hours of admission 24 patients had died; we thought at first that some of these 24 had been kept waiting for a hospital bed for some time, and that the upset of their removal to hospital might have contributed to their early deaths there. However, this was not so; 22 had been admitted immediately on notification, and, of the remaining 2, one had been eleven days and the other six days on the waiting-list. They were mostly medical emergencies, such as coronary thrombosis and cerebral hæmorrhage. Table I gives the duration in hospital in weeks per age-group.

PATIENTS SENT HOME

We visited each of the remaining 500 patients, except 47 who could not be traced (lodgers or inmates of common lodging-houses), 17 who had gone too far away to be visited, and 118 who had died after leaving hospital (15 within a month of discharge, and 78 within three months, these deaths being spread more or less evenly over all the classifications). The stay in hospital of these 500 patients is given in table II.

The ordinary conception of disease in old age is one of long illness. Table II, however, shows that 161 of the 500 patients occupied a bed for only a month or less, and only 24 had done so for more than 199 days. These hospitals were not confined to the care of chronically ill or aged people, such as Affleck[1] investigated in Leeds, where 75% of the patients had been in hospital for more than a year. The proportion of 161 speedy discharges out of 500 shows that immediate active treatment of illness in the elderly in the acute wards of a hospital produces tangible results and may prevent the development of long-term illness. If these results are gained where there is no recognised geriatric unit, much more will be contributed to the prevention of chronic illness when an adequate, efficient, and interested section of the hospital staff is devoted to the treatment of elderly persons.

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[1] Affleck, J. W. *Lancet*, 1947, i, 355.

Royal College of Surgeons of England

At a meeting of the council held on July 29, with Lord Webb-Johnson, the president, in the chair, Dr. Hubert Wyers was elected as the examiner for the diploma in industrial health.

The John Tomes prize for 1945–47 was awarded to Prof. H. H. Stones, in recognition of his research in dental pathology, and the Hallett prize to T. P. S. Powell, of the University of Edinburgh, on the result of the recent primary examination for the fellowship.

Diplomas of membership were granted to the following :

C. P. T. Alexander, M. J. Allwood, W. B. Ashby, R. H. R. Aston, Pamela M. Aviss, J. C. Barker, M. D. Begley, J. R. Bennett, S. Y. Bhagwat, J. M. Bishop, G. C. Blake, R. I. K. Blyth, W. O. Bradbury, M. A. Brennan, W. S. Brown, R. W. Buckley, P. I. Busfield, Anthea M. Bushby, P. J. A. Butcher, H. F. Cantwell, A. J. E. Cater, Ivor Chance, P. J. C. Chapman, Suzanne K. R. Clarke, Sybil M. Cockersell, Henry Collier, J. L. Cotton, D. N. Cow, D. T. Cox, Katherine S. M. Crouch, D. J. Crowther, Mary E. Curling, Katharina D. Dalton, F. J. Davies, H. F. Davies, N. C. R. Davies, F. A. de Hamel, Evelyn F. P. Dennett, J. A. L. Derlien, A. J. De Villiers, D. J. Douglass, G. E. Dower, E. C. Edwards, D. K. Evans, Shafik Fahmy, Paul Fehrsen, E. J. F. Filose, R. A. Fox-Linton, P. B. Foxwell, P. N. Gai, Phyllis A. George, J. A. H. Goldacre, Barbara M. Gray, A. M. Green, E. J. Hargadon, G. L. Harper, Michael Hatton, J. T. Hemingway, C. A. Higgins, J. F. Hindle, Henry Hollis, P. L. Holman, Jean M. Horton, John Humphreys, O. A. N. Husain, Rosemary Huxley-Williams, R. B. Jackson, F. E. James, A. G. Jarrans, Geraint Jones, J. H. Jones, Nesta J. Jones, C. H. G. Kendall, K. J. Kingsbury, Jan Koszyk, Norman Lawrence, Alexander Lebedeff, A. J. Lee, A. H. Levy, R. L. Lindon, H. A. Lomax, M. D. Lord, R. A. McGregor, J. W. R. McIntyre, S. A. Mannan, N. C. March, M. F. P. Marshall, A. P. Maruff, David Mendel, Marie D. Merchant, A. R. Merrill, J. A. R. Moody, W. P. C. R. Moody, Gwyn Morgan, K. Z. Novak, P. O. Oliver, G. R. Outwin, Sankar Panikkar, D. F. Parkin, C. A. Parsons, P. R. Persey, D. L. Postlethwaite, Elizabeth Preston-Thomas, Deonarine Ramdin, James Rankin, E. G. Rees, W. S. Richardson, Janet P. Rickard, D. G. B. Riddick, D. P. Rough, G. J. Schiller, D. L. Sladden, B. H. Smith, R. W. Smithells, R. S. Snell, Roy Southwell, W. F. W. Southwood, C. K. Spalding, J. R. Spears, R. A. Stanger, Rosemary Stephens, Alice H. Stokes, J. W. M. Stone, J. L. V. Summerhayes, E. F. Swift, Margaret N. A. Tew, R. G. Thomas, A. H. Thompson, J. B. Turtle, P. H. Venn, A. F. Verney, J. D. Villiers, D. L. Walker, Charles Waller, Daphne M. L. Walters, D. B. J. Wardle, W. K. M. C. Watkins, W. F. Weatherill, M. A. Weller, Audrey M. Wells, Margaret M. Whitaker, J. H. McN. White, Margaret P. Whittaker, Freda M. Wilcox, I. L. Wilkinson, J. L. Wilkinson, H. O. Williams, A. J. Woolf, Mary I. Wray

The following diplomas were granted jointly with the Royal College of Physicians :

D.P.H.—E. H. Annels, Fairfax Bell, Robert Calderwood, S. P. C. Casey, R. M. Coplans, E. J. Crowe, P. C. Dismorr, J. L. Fluker, A. W. Gilbert, J. L. Gordon, F. L. Groarke, Marjory I. H. Isaac, L. F. Jepson, A. F. H. Keatinge, J. W. McConachie, A. C. McLeish, Morris Price, Henry Richards, Peggy J. C. Roberts, Margaret I. Ross, G. G. Sheriff, M. I. Silverton, R. A. Smart, Ruth M. West.

D.A.—G. B. Badock, T. H. S. Burns, and J. R. S. Shields.

Faculty of Anæsthetists.—The following have been elected to the newly instituted fellowship of the faculty :

Helen B. Alcock, R. E. Apperly, Philip Ayre, Freda Bannister, R. A. Beaver, J. Blomfield, John Boyd, E. G. Bradbeer, R. J. B. Broad, G. Maxwell Brown, F. F. Cartwright, J. N. Cave, L. T. Clarke, R. J. Clausen, R. W. Cope, H. P. Crampton, A. S. Daly, C. J. Massey Dawkins, I. M. Campbell Dewar, H. W. Featherstone, D. Keir Fisher, R. Blair Gould, C. F. Hadfield, E. M. Handfield-Jones, R. P. Harbord, T. A. B. Harris, J. K. Hasler, B. P. Hill, E. Falkner Hill, M. W. P. Hudson, C. H. M. Hughes, John T. Hunter, Ronald Jarman, D. F. Johnson, W. J. Bennett Jones, Miss A. R. Kerridge, E. Landau, J. A. Lee, A. Goodman Levy, W. S. McConnell, V. O. McCormick, R. Machray, J. Ross Mackenzie, R. E. Mansfield, Z. Mennell, Edith Joan Millar, Arthur Mills, R. J. Minnitt, C. W. Morris, L. H. Morris, H. J. V. Morton, W. W. Mushin, M. D. Nosworthy, G. R. Phillips, H. H. Pinkerton, K. B. Pinson, A. F. Potter, W. B. Primrose, R. J. Probyn-Williams, B. Rait-Smith, H. A. Richards, E. H. Rink, Alison Ritchie, F. W. Roberts, S. Thompson Rowling, J. F. Ryan, E. A. Scott, W. M. Shearer, Sir Francis Shipway, O. L. C. Sibley, H. Sington, G. F. Rawdon Smith, R. L. Soper, C. E. Sykes, V. E. Vessell, F. F. Waddy, Sheina C. H. Watters, H. N. Webber, Humphrey B. Wilson, H. Bruce Wilson, H. Woodfield-Davies.

Faculty of Dental Surgery.—On July 16 the first annual meeting of the faculty was attended by some 100 fellows and licentiates in dental surgery, when Lord Webb-Johnson, P.R.C.S., gave a historical survey of the college and its association with dental surgery.

Prof. H. F. Humphreys has been re-elected and Prof. M. A. Rushton and Prof. H. H. Stone elected to the board of the faculty. Mr. R. R. Course has also been elected to the board as representative of the licentiates in dental surgery.

The following were admitted to the fellowship in dental surgery :

Prof. Andrew Francis Jackson, Prof. Sheldon Friel, Prof. J. C. Middleton Shaw, Miss K. C. Smyth, Mr. L. Russell Marsh, Mr. B. Maxwell Stephens.

Royal College of Surgeons of Edinburgh

At a meeting of the college held on July 28, with Mr. F Jardine, the president, in the chair, the following admitted to the fellowship :

S. J. Aptekar, H. W. C. Baillie, D. M. Bell, W. N. Boyd, W Brydone, D. E. Coyle, D. D. G. Curran, K. A. Dalal, V. J. D V. K. Drennan, John Evans, G. G. Farrington, Roger F G. E. Fordyce, J. M. Gold, D. F. P. Gordon, J. P. W. Grant, T Gray, F. S. Gregory, John Grieve, O. E. Hansen, G. V. H A. H. Haysom, Thomas Hunter, J. B. Jack, W. McK. S. K M. S. Khan, Douglas Laing, D. M. Lithgow, D. J. Living A. W. K. Main, Asa Mills, John Macpherson, A. W. MacQu P. M. Naidu, R. G. Patel, V. R. Rob, Fawzy Selim, A. McE. S Felicity E. Soutter, D. G. Steer, E. V. Strisiver, P. J. Tarpey, R Wilkins, J. W. Wilson.

Scottish Conjoint Board

Having passed the final examination, the following have b admitted licentiates of the Royal Colleges of Physicians Surgeons of Edinburgh and the Royal Faculty of Physici and Surgeons of Glasgow :

Freda M. Addly, A. K. Bain, R. G. Blair, J. A. Brown, D Bull, E. S. Cohen, Ruby M. Collister, Jessie McI. L. Duce, Hy Fishman, Abraham Freedman, L. I. Freeman, David Glam P. W. Grant, James Hamilton, Thomas Hannah, D. P. K. Ho N. D. Ker, Alexander Kilpatrick, Abram Kwasnik, G. H. I William Leggat, A. J. Levine, Audrey E. Lower, D. McN. McCurr A. W. D. MacIntyre, Jessie K. M. Main, H. M. Marks, Cather R. S. Mitchell, Margaret E. Morgan, Archie Muir, W. W. M Bernard Nash, Rosalie A. H. Paul, W. H. Reid, W. J. Reilly, B Seltzer, A. E. M. Sieger, *Eirlys Speek*, R. K. Steen, D. F. F. Stephe J. McC. H. Steven, John Stewart, Gwyneth Watkins, Margaret Watt, Sheila M. Wheeler, G. A. Whitefield, Lindsay Wilkie, Sop W. Wright.

Beit Memorial Fellowships

Mr. D. W. Logan, principal of the University of Lond has been elected a trustee of the fund. The following awa have been made :

SENIOR FELLOWSHIP

F. SANGER, B.SC. To study the structure of proteins with spec reference to insulin : at the department of biochemistry, Universi of Cambridge.

JUNIOR FELLOWSHIPS

D. A. DARCY, B.SC. To study the rôle of the lymphocyte a plasma cell in homograft breakdown : at the department of zool and comparative anatomy, University of Oxford.

R. M. C. DAWSON, B.SC. To study biochemical changes in brain associated with different forms of functional activity : the biochemical laboratories, Cardiff City Mental Hospital.

F. N. FASTIER, M.SC. To study the nature of the musculotr action of basic amidine derivatives : at the department of phar cology, University of Oxford.

L. J. HAYNES, PH.D. To study the synthesis of the coenzy cozymase : at the chemical laboratory, University of Cambri

A. T. JAMES, PH.D. To study the relationship between struc and biological activity in naturally occurring substances : at Lister Institute of Preventive Medicine, London.

A. MCCOUBREY, B.SC. To study analgesic and addic *tendencies from a chemical standpoint* : at the departments organic chemistry and pharmacology University of Leeds

S. W. STANBURY, M.B. To study the effect of changes in nerv activity, induced by narcosis and sleep, on the renal circulation blood-pressure in normal and hypertensive individuals ; at department of medicine, University of Manchester.

D. VERAL, M.B. To study the postural hypotension which r follow prolonged rest in bed : at the clinical research unit, Gu Hospital, London.

Minister Meets Chairmen of Executive Councils

Mr. Aneurin Bevan, Minister of Health, last week for the first time the chairmen of the 138 executive coun which have been set up under the National Health Serv Act. Mr. Bevan said that the vast majority of doctors w coöperating in the effort to make the new service a succ A number of authenticated cases had, however, been brou to his notice of doctors who were discriminating in select patients or in the standards of amenities provided for pu and private patients ; he believed that only a very sm minority of doctors were behaving in this way. He ho that any cases which came to light would at once investigated by the local medical committees.

Appointments

COOKE, R. T., M.D. Edin. : pathologist to the Hartlepools Hosp Management Committee.

Scunthorpe and District War Memorial Hospital :

BROWN, J. W., M.D., B.SC. Lond., F.R.C.P. : cardiologist.
MCALLISTER, V. P., M.B. N.U.I., F.R.C.S.E. : surgeon.
MILLAR, J. H. D., M.D. Belf., M.R.C.P. : physician.
MORTON, RALPH, M.B. Edin., F.R.C.S. : asst. ear, nose, and th surgeon.
ROLLASON, W. N., M.B. Birm., D.A. : anæsthetist.

Readmission to hospital has often caused heartache to urses and doctors. We have heard many complaints at patients recover, leave hospital, neglect treatment advice at home, are readmitted to hospital, are scharged well, return to the same environment and glect, and keep on being readmitted and discharged, ith progressively shorter spells at home, until finally ey die. Various remedies have been proposed for this, om the provision of special "chronic sick" hospitals the recommendation that "outside doctors" should ok after their patients better, and the provision of ecial nursing in the patients' homes. So far as our ries is concerned, readmissions were few: 4 patients ad been readmitted three times, and 3 patients twice; e rest had their only stay in hospital in the months nder review, except one stalwart admitted twelve times n the past four years for scabies and infestation with lice. erhaps the comparatively small number of patients who ass through hospital wards in the year makes the reappearance of a known face remarkable, and the readmissions are pt to gain an unwarranted importance because of the act that nurses and doctors know there is a long waiting-ist of sick and "here is this old lady back again."

Though not requiring readmission, 166 of the 269 old people would have benefited by extra attention. The magnificent work done by the nurses of the Glasgow District Nursing Association fails only in one respect—these girls have far too much to do, and it has been to our constant amazement to find them continually happy, bright, and kindly to their patients.

The Corporation of Glasgow has been taking an increasing interest in the nursing of the sick in their own homes, and this interest will be enhanced under he new Health Service Act. Home helps are also provided-for the elderly, irrespective of income, either for a whole day or part of a day. Since the inception of the outdoor medical service in Glasgow the services of a doctor have been available to any old-age pensioner in the city at any time of the day or night, free of charge, and each doctor has working with him a fully qualified and experienced nursing sister. *There is also in Glasgow a free ambulance service which will take a patient to hospital for special examination or treatment and return he patient to his home.

With all these services in view, we considered their pplication to the 166 people for whom we thought urther treatment was advisable. Visits by a doctor were required for 139, with the help of the nursing ister. These people had many minor ailments, and they equired the continuance of the supervision given in hospital. Since their discharge no medically qualified person had paid much attention to them, and a fair number had lost interest in their health; in fact, many of them had not seen a doctor since leaving hospital. With these old people the tactful and persuasive nurse is of inestimable value in inducing them to take more care of themselves and to see regularly to their medicines or dressings; hence for every visit by a doctor an average of four visits by the nurse is desirable to secure the application of the doctor's advice.

The ambulance service could have been used to convey to the outpatient department 17 patients in need of massage, radiant heat, or other particular treatment which could not be conveniently supplied at home. Domestic helps were desirable in 17 cases, but not for the whole day; the general tidying of the house and the preparation of a meal was all that was needed. The latter item will perhaps become less necessary with the recent introduction of a "meals on wheels" service under the Society of Social Service and staffed by the Women's Voluntary Services.

The two hospitals concerned admitted patients from all strata of society. Since the Local Government Act 1929 was implemented in Glasgow, they have taken an increasing share in the treatment of the general population and have not, as previously, been confined to those on the poor-law level. Home conditions varied greatly, but the large majority lay among the lower working classes, and it was pleasing to find that in 246 out of the 318 houses visited conditions were not inimical to the well-being of the patient either physically or mentally. We based our assessment of this on the general attitude of the friends and relations looking after the old people and on the domestic surroundings. As most general practitioners find, there is a perceptible atmosphere about a home where everything possible is being done for the patient's comfort. This faculty we used in deciding whether or not the general care of the patient was the best that circumstances permitted.

We next asked ourselves, "Has the condition of the patient regressed since discharge?" This was most difficult to answer, since we had not had an opportunity to examine them in hospital. However, by a careful perusal of the hospital record sheets, which were admirably detailed, we gained a fairly just assessment of the patient's condition on leaving hospital. Into this question also came the length of time between the date of discharge and the date of our visit, and we were glad to find that 242 of these elderly people had maintained the improvement which hospital treatment had brought about:

Has patient regressed since discharge?

Interval between discharge and visit	*Yes*	*No*	*Total*
1 month	3	10	13
2 months	2	10	12
3 ,,	2	11	13
4 ,,	7	17	24
5 ,,	6	17	23
6 ,,	2	6	8
7 ,,		11	11
8 ,,	1	7	8
9 ,, or over	53	153	206
Total	76	242	318

This recovery-rate is a great stimulus to those who care for the aged and a further step in the destruction of the attitude of hopelessness in the treatment of senile illnesses: "He is old; we can do little for him." The expressions of gratitude of these people for the benefit, comfort, and added life given to them by the efforts of the hospital staff were embarrassing, and we who have found our work among the elderly outside hospital gladly join them in this thankfulness. Another source of embarrassment, yet pleasure, for us was the delight voiced by and shown in the faces of the old people when they realised that we doctors had come to call on them to inquire into their state of health since their discharge from hospital. There is here a great field of worthwhile effort for interested doctors to maintain the good health of elderly patients who have had hospital treatment. In many cases we found that an expectorant mixture or a laxative or some such other slight medicinal treatment was required. The patient was not so ill as to send for a doctor, but we felt that, had the slight disability been allowed to continue, the health of the patient would eventually have deteriorated. Many of these elderly people are loth to send for a doctor, because they are afraid of being thought a nuisance.

RECOVERY HOMES

In 1946, among the elderly people outside hospital, only 51 out of 1001 were willing to go to a home for the aged, even though the conditions were described in rosy colours; yet 301 were willing to go to hospital. On this occasion only 10 out of 318 would have gone

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* From July 5, 1948, this service no longer exists.

TABLE I—DEATHS IN HOSPITAL

Age (years)	Days in hospital																			
	1–7	8–14	15–21	22–28	29–35	36–42	43–49	50–56	57–63	64–70	71–77	78–84	85–91	92–100	101–119	120–149	150–199	200–299	300–399	400 or more
60–64	8	2	1	1	2	2	..	2	..	..	1	..	..	1	..	..	1	..	..	1
65–69	15	12	5	..	..	2	3	1	..	..	..	..	3	1	3	2	1	1	1	..
70–74	29	7	4	3	2	1	2	1	2	2	..	..	..	2	..	1	..	2	..	..
75–79	11	3	4	4	3	1	1	1	..	..	1	2	..	..	1	3	6	3	1	3
80–84	8	..	2	2	..	1	..	2	..	3	1	..	..	1	..	4	..	..	1	2
85–89	2	2	1	..	..	..	1	..	..	..	1	..	..	..	1	..	..	1	..	..
90 or more	1	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	74	27	17	10	7	7	8	7	2	5	4	2	3	5	5	10	8	7	3	6

PRESENT SOCIAL CONDITION

The care of the patients after their stay in hospital devolved mostly on relations and neighbours. Of the 318 examined in their own homes 10 were looked after by the spouse, 20 by other relations only, 5 by neighbours only, and 221 by a combination of relations and friends, but 62 relied on their own efforts for cooking and cleaning. Of the latter, 12 had been in hospital because of a cardiac condition, but we found them on the whole managing their affairs fairly well. In every case it was of their own volition that they were "on their own," since each had refused help from friends, and they insisted that they were happier and better in health when independent. The fact that only 5 relied on neighbours alone for domestic assistance is very satisfactory, and bears out what we have found in our everyday work—that, when the old person has been so ill as to require treatment in hospital, relations and friends gather round them on their discharge, and either the patient is taken to live in the home of a friend or someone comes to live as a companion with them. We found 24 of our patients confined completely to bed. It might seem strange that a hospital allowed them to be discharged in such a condition, but the explanation is fairly simple. Before discharge, the patients had all been able to get up, but too much sympathy on their home-coming led to their being more or less ordered by their unqualified nurses to "stay in bed for a day or two to recover your strength." The patients were quite fit to be up, and if left to their own devices would certainly have done so. However, after a day or two of super-mollycoddling they began to enjoy being spoiled, and thus gradually lost the power to rise at all. Time and time again we have found in our work that old people have been kept unnecessarily in bed, to their own great detriment; yet, if we suggest that the patient though perhaps paralysed on the right side, is capable of getting up 10–14 days after the onset of the lesion, we are looked on as "hard and not understand enough," and another doctor is sent for who is m sympathetic and agrees with those surrounding patient that "the heart is weak" and she should m no attempt to get up for four or five weeks. Howe at the end of this time, perhaps later, those respons for the care of the patient begin to get tired, and we called in again as hospital-admission officers to h the patient removed to hospital. Failing this course events, the patient really dies through being confined bed unnecessarily.

Apart from those confined to bed, 179 were capa of looking after themselves. This is an improvement the findings in the Glasgow investigation in 1946

	Present investigation (318 cases)		1946 investig (1001 case
Confined to bed ..	24 (7·5%)	..	286 (28 6%
Up but unable to care for self ..	115 (36·5%)	..	307 (30 7%
Able to care for self	179 (56%)	..	408 (40 7%

It seems evident that, had the patients requiring hosp treatment in the 1946 investigation been admitted improved to the same extent as in this survey, the perc age confined to bed would have been materially redu

Of the 318 people examined 49 should have l readmitted to hospital—17 for permanent stay 32 for active treatment. None of the alimentary urinary cases required to be retained in hospital. T was no necessity for the remaining 269 to be readmit for in this large proportion the cure had been so comp that they were able to take their places among the gen population once again. Whereas in 1946 it was fo that 31% of the old folk required admission to hosp in this investigation we found that, of those who had the advantage of indoor treatment, only required readmission.

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2. Curran, M., Hamilton, J., Thomson, E. N. *Ibid*, 1946, i, 1

TABLE II—DAYS IN HOSPITAL

Age (years)	1–7	8–14	15–21	22–28	29–35	36–42	43–49	50–56	57–63	64–70	71–77	78–84	85–91	92–100	101–119	120–149	150–199	200–299	300–399	400 or more
60–64	6	9	6	12	8	8	..	6	6	2	3	2	2	..	..	4	1	1	..	..
65–69	2	9	17	11	24	10	16	10	7	6	6	4	4	6	9	5	4	7	1	1
70–74	4	15	9	14	16	5	11	9	8	2	4	3	4	3	7	2	9	8	..	1
75–79	3	5	8	10	11	8	4	3	4	5	1	4	3	2	2	2	3	2	1	..
80–84	2	4	5	5	6	5	..	1	1	1	..	1	2	..	3	1	1	2	..	..
85–89	..	2	2	..	2	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..
90 or more	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	18	44	47	52	67	36	31	29	27	16	14	14	16	11	21	15	18	20	2	2

ssue and it produces neither remote nor local body hanges." They found no evidence of reaction, either to foreign body or inflammation, when polythene was uried in body cavities or tissues. Guenther et al. (1947) ad already reported on the use of polythene tubing in enoclysis, and intravenous solutions had been kept unning into the same vein for two weeks.

Polythene has been used in the following surgical procedures by Brown et al. (1947): anastomoses of the common bile-duct, trachea, and pelvic colon; replacement or repair of the dura mater; peripheral nerve anastomoses; and cosmetic uses—e.g., to cover burr holes in the skull. Its use in palliative ventriculostomy in inoperable occlusion of the sylvian aqueduct has been suggested by Ingraham et al. (1947).

Exsanguination transfusions in hæmolytic disease of the newborn, with a single plastic catheter inserted into the umbilical vein, have been practised by Diamond (1947), and Arnold and Alford (1948) have described an additional technique with polythene tubing inserted into the long saphenous vein through an incision over the femoral triangle. Its use as a flexible cannula in venoclysis has been described in the U.S.A. by Guenther et al. (1947). In Great Britain, polythene tubing has been used for cardiac catheterisation, and by Mollison (1948) for obtaining specimens of blood "from the area of the portal vein" in the newborn.

Polythene is also in use for the insulation of radium and by virtue of its being chemically inert it is already appearing in some forms of chemical apparatus.

VENOCLYSIS IN INFANTS

Since the availability in this country of polythene tubing of British manufacture is not widely known to the medical profession, the present study was approached by a somewhat circuitous route. Specimens of plastic catheter suitable for venoclysis were obtained from America and submitted to Mr. N. D. Macleod, of Imperial Chemical Industries, Plastics Division. He confirmed what he had already suspected—that the catheters were made from polythene—and he immediately provided samples of 0·5 mm. bore for experimental purposes. Initial experiments having proved an unqualified success, the Telegraph Construction and Maintenance Co. Ltd. was approached with a view to supplying the tubing in bulk. This they did in bores of 0·5 mm., 1·0 mm., and 2·0 mm., at an average cost of 2s. for ten yards.

Sterilisation.—The tubing can be sterilised by boiling for 15 min. It is essential to ensure that the entire lumen is full of water before boiling, using a syringe for this purpose if necessary. Boiling interferes slightly with flexibility, but this action may be reduced to a minimum by "shock-cooling" the tubes direct from the steriliser to cold sterile water. Autoclaving at temperatures over 100°C cannot be used, and repeated boiling is inadvisable.

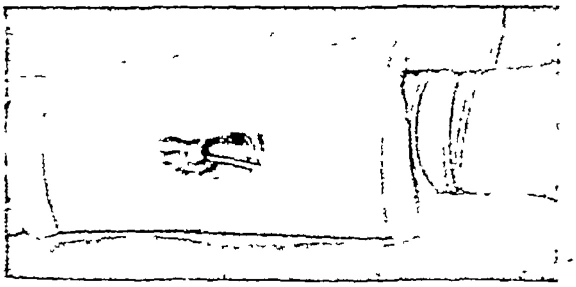
Sterilisation with antiseptics has been recommended by Diamond, who advocated 'Zephiran.' This antiseptic is of approximately neutral pH, has a non-selective and rapid bactericidal action in low dilutions, and is innocuous to man. It has no action on polythene. Surgical instruments can be sterilised in a minimum of 30 min. with a 1 in 1000 dilution of it. The antiseptic should be drawn up into the tube so that the entire lumen is filled before immersion in a vessel containing the sterilising agent. Before the tubing is used it should be immersed in a vessel of sterile saline and the lumen cleared by syringing. A few ounces of this product were released to us for the purposes of this investigation, but unfortunately it is not generally available in this country. Sections of tubing were exposed to a 1 in 1000 dilution of zephiran for an hour and for 24 hours before being cultured in broth.

Tests were also made on the efficiency of 'Dettol.' Sections of tubing were exposed to 2% and 5% dettol for 24 and 48 hours before being cultured in a broth medium.

Tubing was exposed to pure and 5% dettol for three weeks and was found to gain weight by 11% and 8% respectively, owing to the absorption of certain essential oils in the antiseptic causing a slight softening of the plastic but not true change in chemical composition. In view of this, however, it was decided to exclude dettol as a sterilising agent.

It is known that formalin vapour is used elsewhere for this purpose—the tubing being enclosed in a glass vessel with formalin tablets. Although this method is efficient traces of formalin are absorbed by polythene tubing and cannot be removed readily by washing but only by slow diffusion in air.

Cetrimide ('Cetavlon') shares, with zephiran, the advantage of being both highly bactericidal and relatively non-injurious to tissue. A 1% solution is of approximately neutral pH; it has no action upon, nor is it absorbed by, polythene.



Dressing with inspection window and turns of polythene tube round limb.

These various methods of sterilisation of polythene tubing proved uniformly efficacious. A non-sterile tube, gave a heavy growth of *Staph. aureus* after 24, 48, or 72 hours' incubation. But tubing submitted to boiling for 15 min., 2% dettol for 24 or 48 hours, 5% dettol for 24 or 48 hours, or 0·1% zephiran for 60 min. or 24 hours remained sterile in all cases after 72 hours' incubation.

Further non-sterile tubes gave a very heavy growth of *Staph. aureus*, *Bact. coli* and *Strep. fæcalis*; but after (*a*) immersion in 1% cetrimide for 24 hours, or (*b*) exposure to formalin vapour from dry tablets for 24 hours neither tube produced any growth during 72 hours' incubation.

Each method proved satisfactory from the bacteriological standpoint. Though zephiran is probably the agent of choice in the sterilisation of polythene tubing, sterilisation by immersion and storage in 1% cetrimide from which the tubes may be removed as required appears a satisfactory alternative. For this purpose we have used a glass tube of 1 or 2 in. diameter and 1 yard in length sealed at one end and stoppered with a rubber bung at the other. If this bung is penetrated by a smaller glass tube open to the interior of the larger but sealed externally and blown to form a chamber, the large tube may then be stoppered after filling with cetrimide and will contain no air bubbles—the latter being forced into the small chamber. This method has the advantage that the tubing may be sterilised without first being coiled and is more easily removed. Being lighter than water the polythene will float to the surface if attempts are made to sterilise it in a vessel of large surface area exposed to air. As an emergency measure, boiling for 15 min. followed by "shock-cooling" renders the tubes safe for use.

Assembly of Apparatus.—The standard apparatus for intravenous infusion is used as far as the adapter, where a needle of suitable bore for use with the polythene tube is fixed. The point of the needle is inserted into the to such a home, the remaining 308 giving a very definite refusal. The reason is not far to seek. When hospital admission is suggested, the patients know that they will probably be discharged in a few weeks after good nursing, a rest, and general care, apart from any medical or surgical treatment required. They know that when they leave hospital they will be returned to their own home, their own corner of the world, which has been kept open for them by relations or by the local authority. But they feel that there is a finality about going to a home for the aged. They will never return to their own fireside, and if they leave the home they will have no place to go to, because their houses will have been given to others.

Many of those admitted to hospital required only general medical or nursing care, impracticable in their home surroundings, but possible in a convalescent home; they did not need examination or treatment by a specialist, but could have been treated by a general practitioner, had their social condition been better. They would be pleased to go to such a recovery home, even for several months, because they know they would eventually come back to their own house. We suggest that, when planning for the old people's welfare, local authorities should consider the provision of such homes, with nursing care and with medical attention readily available. This would help to relieve some of the pressure on hospital beds in favour of those who require skilled treatment, and would diminish the number of elderly people entering the public-assistance institutions.

A modification of the system of screening advised by Affleck,[3] with the aim not of collecting similarly diseased conditions in the same ward but of selecting those who would do well in a recovery home, is well worthy of consideration. Admission to these homes could possibly be through the hospitals, where examination and accurate diagnosis by a specialist would reveal whether treatment in such a home would serve the patient as well as treatment in hospital. Some voluntary organisations already have such homes, and the Government are to be congratulated for the encouragement given to them by the National Assistance Bill.

The nursing in these recovery homes does not call for a full staff of trained nurses; a few such skilled people would be necessary, but most of the staff could quite well be assistant nurses or general helps. Such work could, with advantage to all, be included as part of a nurse's training. This would teach young nurses how to care for the elderly; it would be of advantage to the old people, and it has a third advantage. During their years of training young nurses would, for a period, live at the seaside or in the country—a great boon to a girl living in a hospital in industrial surroundings.

CONCLUSION

We have here given some of our impressions on elderly patients discharged from hospital, in the hope that this section of the population will not be forgotten in the future as they have been in the past. We would like in all humility to suggest to our medical colleagues, especially the more youthful, a very sobering thought in our treatment of old people. Though we can treat cases of appendicitis, pneumonia, tuberculosis, &c., quite impersonally, because we will possibly never suffer from these conditions, we will, all, barring early death, suffer old age. Therefore, even if from a selfish motive alone, let us give more care and thought to the present aged population, keeping in mind that any benefit we give them will be our inheritance.

Our sincere thanks are due to Dr. Stuart I. A. Laidlaw, medical officer of health for Glasgow, for his permission to publish and his help in preparing this paper; Miss Kay of Glasgow Public Health Department; and the clerical staffs of Stobhill and Southern General Hospitals.

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[3] Affleck, J. W. David Watson Prize Lecture. Glasgow, 1948.

SOME MEDICAL USES OF POL

WITH SPECIAL REFERENCE TO VENOCLYSIS IN INFANTS

JAMES W. FARQUHAR
M.B. Edin.

IAN C. LEWIS
M.B. Edin.

From the Royal Hospital for Sick Children, Edinburg

'POLYTHENE' is a plastic having physical and cher properties which make it suitable for a variety of purposes. Though it is a British invention, no of its medical application have been published in Englan with the exception of a reference to its use in the newbor by Mollison (1948); but it has been used extensive in America.

Chemical Properties.—Polythene is a solid compo of five hundred or more ethylene units linked togethe under conditions of high pressure and temperature, wit the aid of a catalyst. It is insoluble in all known solvent at room temperature; but benzene and other solvent act at temperatures above 60°C. It is complete resistant to the corrosive action of food chemicals, an it is not attacked by concentrated mineral acids, includin hydrofluoric acid, or by caustics. It has no action o nor is it attacked by, isotonic saline, Hartmann's solutio Darrow's solution, glucose solution, whole blood or plasm soluble sulphanilamide, sulphapyridine, sulphathiazol sulphacetamide, sulphadiazine, and sulphamezathin (N. D. Macleod, personal communication), penicilli (A. F. MacCabe, personal communication, Huelsebusc et al. 1946, Ingraham et al. 1947), or streptomyci (A. F. MacCabe, personal communication, Huelsebusc et al. 1946). No plasticiser or antioxidant is used in its manufacture.

Physical Properties.—The specific gravity of polythen is 0·92, and water absorption 0·01%. Polythene i transparent, and polythene film is transparent to X-ray The melting-point is 115°C. Polythene can be sterilis by boiling at 100°C, but repeated boiling of the tubin tends to cause cracks (see below). It cannot be sterilis in an autoclave. Shrinkage is less than 2% after boilin —i.e., dimensional stability is high. The substan remains flexible at −40°C. The elongation at break 400–500%. It can be extruded as tubing of any diame and produced as fine sheeting which does not t —e.g., when sutured—but can be cut to any shape wi scissors or a knife and is highly flexible and elasti It ignites and burns slowly. It is a poor conductor heat. It has a low coefficient of friction and a tensil strength of 1500–2000 lb. per sq. in.

History.—Polythene was invented in the laboratorie of Imperial Chemical Industries in England in 193 (Allen 1945). Production presented great difficulti but by 1938 these had been overcome and a pilot pla was running in that year, an experimental submarin cable being manufactured. A small quantity wa produced for television purposes in 1939, during whic year full-scale production began. From the outbreak o war in the autumn of 1939 polythene (under the tra name 'Alkathene') was largely used in the manufactu of radar apparatus throughout the war years. information about polythene was given to an Americ delegation in 1941, and the U.S.A. was in full producti by 1943.

MEDICAL APPLICATIONS

The inert character of polythene renders it suitabl for implantation into animal tissues. Reports o experimental implantation of tubing and film are already available in the U.S.A. Brown et al. (1947) reported "We do not believe it too early to state that polythen has great promise as a material for temporary or per manent surgical implantation in living tissue. . . . I does not undergo change when surrounded by livin sue and it produces neither remote nor local body changes." They found no evidence of reaction, either to foreign body or inflammation, when polythene was tried in body cavities or tissues. Guenther et al. (1947) had already reported on the use of polythene tubing in venoclysis, and intravenous solutions had been kept running into the same vein for two weeks.

Polythene has been used in the following surgical procedures by Brown et al. (1947): anastomoses of the common bile-duct, trachea, and pelvic colon: replacement or repair of the dura mater: peripheral nerve anastomoses: and cosmetic uses—e.g., to cover burr holes in the skull. Its use in palliative ventriculostomy in inoperable occlusion of the sylvian aqueduct has been reported by Ingraham et al. (1947).

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Since the availability in this country of polythene tubing of British manufacture is not widely known to the medical profession, the present study was approached by a somewhat circuitous route. Specimens of plastic catheter suitable for venoclysis were obtained from America and submitted to Mr. N. D. Macleod, of Imperial Chemical Industries, Plastics Division. He confirmed what he had already suspected—that the catheters were made from polythene—and he immediately provided samples of 0·5 mm. bore for experimental purposes. Initial experiments having proved an unqualified success, the Telegraph Construction and Maintenance Co. Ltd. was approached with a view to supplying the tubing in bulk. This they did in bores of 0·5 mm., 1·0 mm., and 2·0 mm., at an average cost of 2s. for ten yards.

Sterilisation.—The tubing can be sterilised by boiling for 15 min. It is essential to ensure that the entire lumen is full of water before boiling, using a syringe for this purpose if necessary. Boiling interferes slightly with flexibility, but this action may be reduced to a minimum by "shock-cooling" the tubes direct from the steriliser to cold sterile water. Autoclaving at temperatures over 100°C cannot be used, and repeated boiling is inadvisable.

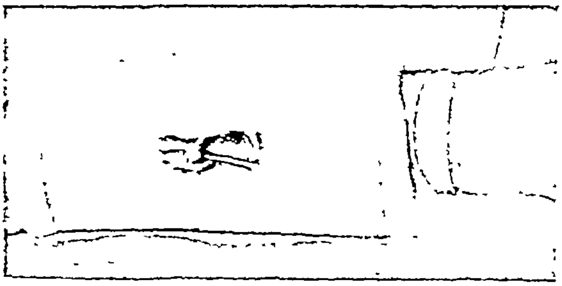
Sterilisation with antiseptics has been recommended by Diamond, who advocated 'Zephiran.' This antiseptic is of approximately neutral pH, has a non-selective and rapid bactericidal action in low dilutions, and is innocuous to man. It has no action on polythene. Surgical instruments can be sterilised in a minimum of 30 min. with a 1 in 1000 dilution of it. The antiseptic should be drawn up into the tube so that the entire lumen is filled before immersion in a vessel containing the sterilising agent. Before the tubing is used it should be immersed in a vessel of sterile saline and the lumen cleared by syringing. A few ounces of this product were released to us for the purposes of this investigation, but unfortunately it is not generally available in this country. Sections of tubing were exposed to a 1 in 1000 dilution of zephiran for an hour and for 24 hours before being cultured in broth.

Tests were also made on the efficiency of 'Dettol.' Sections of tubing were exposed to 2% and 5% dettol for 24 and 48 hours before being cultured in a broth medium.

Tubing was exposed to pure and 5% dettol for three weeks and was found to gain weight by 11% and 8% respectively, owing to the absorption of certain essential oils in the antiseptic causing a slight softening of the plastic but not true change in chemical composition. In view of this, however, it was decided to exclude dettol as a sterilising agent.

It is known that formalin vapour is used elsewhere for this purpose—the tubing being enclosed in a glass vessel with formalin tablets. Although this method is efficient traces of formalin are absorbed by polythene tubing and cannot be removed readily by washing but only by slow diffusion in air.

Cetrimide ('Cetavlon') shares, with zephiran, the advantage of being both highly bactericidal and relatively non-injurious to tissue. A 1% solution is of approximately neutral pH: it has no action upon, nor is it absorbed by, polythene.



Dressing with inspection window and turns of polythene tube round limb.

These various methods of sterilisation of polythene tubing proved uniformly efficacious. A non-sterile tube gave a heavy growth of *Staph. aureus* after 24, 48, or 72 hours' incubation. But tubing submitted to boiling for 15 min., 2% dettol for 24 or 48 hours, 5% dettol for 24 or 48 hours, or 0·1% zephiran for 60 min. or 24 hours remained sterile in all cases after 72 hours' incubation.

Further non-sterile tubes gave a very heavy growth of *Staph. aureus*, *Bact. coli* and *Strep. fæcalis*: but after (*a*) immersion in 1% cetrimide for 24 hours, or (*b*) exposure to formalin vapour from dry tablets for 24 hours neither tube produced any growth during 72 hours' incubation.

Each method proved satisfactory from the bacteriological standpoint. Though zephiran is probably the agent of choice in the sterilisation of polythene tubing, sterilisation by immersion and storage in 1% cetrimide from which the tubes may be removed as required appears a satisfactory alternative. For this purpose we have used a glass tube of 1 or 2 in. diameter and 1 yard in length sealed at one end and stoppered with a rubber bung at the other. If this bung is penetrated by a smaller glass tube open to the interior of the larger but sealed externally and blown to form a chamber, the large tube may then be stoppered after filling with cetrimide and will contain no air bubbles—the latter being forced into the small chamber. This method has the advantage that the tubing may be sterilised without first being coiled and is more easily removed. Being lighter than water the polythene will float to the surface if attempts are made to sterilise it in a vessel of large surface area exposed to air. As an emergency measure, boiling for 15 min. followed by "shock-cooling" renders the tubes safe for use.

Assembly of Apparatus.—The standard apparatus for intravenous infusion is used as far as the adapter, where a needle of suitable bore for use with the polythene tube is fixed. The point of the needle is inserted into the lumen of the tube, and the tube eased over the shaft of the needle to form a snug and watertight junction. Recently, we have tried to improve on this by using only 2 in. of rubber tubing below the viewing chamber, followed by 2 ft. of 2 mm. polythene tube which fits snugly over the adapter. This 2 mm. tube has a 1 mm. tube fitted into its lower end, and this in turn is fitted, if necessary, with 0·5 mm. tubing. Leakage at the junctions of these tubes, however, gradually assumes serious proportions. Unfortunately the extrusion process does not allow of variation in the bore of the tubing as it is manufactured: otherwise a tapered end would have been produced.

Polyisobutylene (P.I.B.) rendered plastic by a small amount of benzole makes a very satisfactory watertight union when smeared around the junction of two tubes. The union, however, is not a true bonding and will not resist tension although capable of standing up to considerable pressure within the lumen.

Insertion of Tube into Vein.—The ease with which polythene tubing is slipped into the smallest vein is striking. No stylet or introducer is required, the end of the tube being shaped with scissors to form a suitable bevel for the size of the vein. The tube is then slipped into the cut vein as usual and passed up for some inches before a retaining ligature is tied. The 0·5 mm. tube is suitable for fluids containing electrolytes only, and the 1 mm. bore should be used for blood or plasma. The latter can be readily slipped into a collapsed vein a third as wide as the tube. We have used a single suture to tie the tube to the skin about 1 in. from the incision. Using about 3 ft. of terminal tubing, three or four turns are taken round the limb before passing to the apparatus (see figure). This precautionary measure takes the strain of any unexpected violent tug and may also warm the fluid a little as it passes. Care should be taken not to allow the infusion to stop completely, because venous blood will otherwise pass back into the catheter and eventually clot.

The Dressing.—Earlier investigation made it more than probable that "drip sepsis" was due not to the operative procedure of cutting down but to removal of the dressing too often thereafter to examine the wound or to adjust a drip which was not running satisfactorily. To obviate this a window is cut in the sterile gauze dressing over the incision. Sealing this off is a single turn of sterilised polythene sheeting (see figure). This window enables the wound to be observed easily, and the dressing need not be removed until the drip is discontinued. The proximal end of the tube is at a considerable distance from the incision in case any adjustment should have to be made. The dressing is sufficiently open to prevent anaerobic culture of micro-organisms. Polythene film should never be applied directly over the wound and sealed.

RESULTS

We have now had experience of polythene tubes for some months and the results taken together with the American evidence, have stimulated us to publish this report in the belief that an advance has been made in the technique of venoclysis in infancy. Infusions have been kept running up to five days, and most of them were discontinued because they were no longer required.

Slight œdema is sometimes noted, but there has been no redness or appearance of inflammation. The œdema may have been secondary to a phlebitis due to persistent use of 5% glucose in babies.

The wounds compare favourably with those in which a metal needle or cannula has been inserted, and healing has been by first intention in all except a baby mongol with very poor peripheral circulation.

Blood and plasma flow readily through the 1 mm. No infusion has come to a standstill on its own.

We have recently made use of 1% cetrimide contai 1 in 500 acriflavine for preparation of the skin.

ADVANTAGES IN NURSING

The nurses in particular have found the polyth tubes a great boon, since the infant can be nursed a minimum of difficulty. The following are the cular advantages of using flexible polythene tubes venoclysis of infants:

(1) No limbs need to be splinted, since the highly flexi tube "gives with the vein" and will not rupture the ve wall or cause discomfort. This allows free movement, the baby's position can be changed at will. It also enab the operator to use veins, such as the short (external) saphena which previously were avoided if possible because of splinti difficulties. In splinting it is not unknown for the constricti bandages to cause venous obstruction. With polythe tubing this complication cannot arise.

(2) The great freedom of movement allows the nurse clean and change the baby easily when an infusion into saphenous vein is running. This is a great advantag particularly when it is necessary to treat sore buttocks.

(3) The limit of the baby's movement is the length of polythene tube, and so the baby is fed, as any other, besi the cot, the nurse having no cause for anxiety about th security of an infusion cannula or needle.

(4) Without any risk of damage or of impairing efficienc the baby can be wrapped up and taken to the theatre or th X-ray department, upstairs or downstairs, by one or, preferably, two persons.

(5) The baby is relieved of all the painful immobility o methods requiring splintage, with the associated dangers of hypostatic pneumonia, broken skin, and drip-wound infection

SUMMARY

Polythene is a flexible transparent plastic, easily sterilised, and innocuous to living tissue.

In the form of fine tubing, it is admirably suited for venoclysis in infants.

Polythene tubing is effectively sterilised by boiling or by soaking in cetrimide or zephiran.

Methods of preparing and introducing the tubes are discussed.

Risks of "drip sepsis" can be minimised by using a dressing with a polythene window which enables the "drip" wound to be inspected without disturbing the dressing.

We wish to thank Dr. Douglas Nicholson and Prof. R. W. B. Ellis for permission to use the tubing in the wards in their charge, and the latter for help and advice in the preparation of this article; Mr. N. D. Macleod, of Imperial Chemical Industries, Plastics Division, for his analysis of the American tubing, for assistance in investigating the chemical properties of special interest in its medical use, and for his help in obtaining supplies of polythene, 'Cetavlon,' and polyiso-butylene through the courtesy of I.C.I. and the Telegraph Construction and Maintenance Co. Ltd.; Dr. A. F. MacCabe, of the department of bacteriology, University of Edinburgh, for his investigation of the potency of streptomycin and penicillin after long exposure to polythene; the hospital laboratories for assistance in several of the experiments; and Messrs. Bayer Products Ltd. for supplying zephiran.

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PULMONARY TUBERCULOSIS IN THE OLD

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MANY doctors think that pulmonary tuberculosis in the aged is chronic and relatively benign and do not realise that it is not uncommon and may be highly infective.

Amberson (1943) attributes most cases to reactivation of old lesions. Arnstein (1941) has produced evidence of pneumoconiotic lesions in aged city-dwellers, unconnected with industrial hazards, which may light up healed foci. Dublin (1941) shows that the peak incidence of tuberculosis in adult males is at the age of sixty-five. Harpøth (1941) notes that in 85 out of 950 new cases in Copenhagen in 1939 the patients were over fifty-five. Harrell (1944) has drawn attention to the misleading nature of mortality figures, since many of these patients do not die "tuberculosis deaths." Post-mortem surveys (Taubert 1925, Schlesinger 1929, Freeman and Heiken 1941), have demonstrated not only the frequency but also the widespread character of tuberculosis in the old, scarcely any organ being exempt, and the miliary form being not infrequent.

The symptoms are insidious and may be masked by the general process of ageing. The infectivity of the older subject is generally accepted. Trossarelli and Lanino (1938) found sputum-positive cases, previously unsuspected, among the inmates of an old people's home, and Miller and Henderson (1942) observed symptomless cases with persistently positive sputa over a period of years in their series. The proportion of sputum-positive cases varies in different reports and is influenced by the thoroughness of methods used. Figures from 41% (Joress 1938) to 79·1% (Banyai 1930) and even higher have been found.

There is on the whole a predominance of men in series reported. Patoir (1938) thought the proportion of men to women was 2 : 1 ; this figure is also given by Amberson (1943). The influence of various factors contributing to this is discussed by Rich (1944).

THE PRESENT SERIES

My cases are collected from the records of a unit in general wards with a fairly high admission-rate of older patients. In 1938–46 the number of patients aged over sixty found to have tuberculosis was 69. As in all retrospective research, one difficulty was the factor of personal observation of the individual responsible for the case-records, and this necessitated care in the interpretation of data and the rejection of some cases in which the necessary criteria had not been fulfilled. Diagnosis was radiological and clinical, with confirmation where possible by sputum examination, and in a few cases by necropsy.

There were 60 men and 9 women. One cause of the larger number of men appears to be that many old men live in "model lodging houses" and similar places, and of necessity go to hospital with ailments which call for nursing. The age-distribution was as follows, the youngest being sixty and the oldest eighty-two.

Age	*Men*	*Women*
60–65	18	2
65–70	23	1
70–75	12	3
75–80	5	2
80 plus	2	1

Most of the men had been heavy manual workers. The series included 4 stone-masons, 2 miners, and 1 knife-grinder, none of whom showed any radiological sign of pneumoconiosis, and 1 miner diagnosed radiologically as a case of anthracosis.

The diagnoses made before the patients were admitted to hospital varied considerably: 4 cases had already been diagnosed as pulmonary tuberculosis and had been treated in dispensaries; 27 patients were admitted with bronchitis, 7 with cancer of different organs, 6 because of senility, and the remainder with miscellaneous complaints.

SPUTUM

In 34 cases, or almost half, tubercle bacilli were found in the sputum by examination of routine smears; in some cases the examination was carried out after antiformin concentration. On investigation it was found that in 30 of the cases which gave negative results, insufficient examinations had been carried out to exclude the presence of tubercle bacilli with certainty—e.g., when patients with advanced tuberculosis died soon after admission.

FINDINGS POST MORTEM

Only 5 cases came to necropsy:

Case 1.—A man, aged 78, had extensive active tuberculosis with caseation and cavitation of both lungs. The pleural cavities were nearly obliterated by adhesions: and there was also tuberculous epididymitis.

Case 2.—A woman, aged 61, had been diagnosed radiologically as having apical tuberculosis, probably a reactivated old lesion, in 1938. In 1940 necropsy revealed chronic bilateral pulmonary tuberculosis, with fibrosis and cavities as large as peas, numerous new tubercles in both lungs, and tuberculous bronchopneumonia.

Case 3.—A man, aged 70, had miliary tuberculosis, with tuberculous bronchiectatic cavities in both lungs and tuberculous meningitis. He had been examined a year before, and right apical tuberculosis had been diagnosed; no tubercle bacilli were found in the sputum in nine examinations in five weeks.

Case 4.—A man, aged 64, had cancer of the large bowel and pulmonary tuberculosis. At necropsy active tuberculous bronchopneumonia, with numerous new nodules in both lungs, was found.

Case 5.—A man, aged 70, with negative sputum, had been diagnosed radiologically as having fibroid phthisis, with minimal physical signs. At necropsy indications of activity were found, but the process was limited.

This very small series of necropsies covers a large field of pathology of tuberculosis in the old, and shows that the disease progressed rapidly.

FAMILY HISTORY

Full studies of family history in this type of patient, with reference to tuberculosis, are uncommon, but a careful study was made by Snell (1941) covering preceding and succeeding generations. In the present series, out of 60 patients from whom a reasonably full history was obtained, a strongly suggestive or positive family history was elicited in 13 cases (22%). It must be remembered that in most cases in which a patient's parents have attained the age of seventy or thereabouts, they are described as having died of "old age" unless something dramatic happened—e.g., a cerebral vascular lesion.

A previous history of pleurisy or of treatment for tuberculosis was given in 20 cases out of 63 (32%).

ONSET

Symptoms of onset were in most cases vague. It is impossible to assess these accurately, since many of these patients are poor witnesses, but the main symptoms of onset in 63 cases were:

Symptom	*No. of cases*
Cough	31 (*49%*)
Weakness	10 (*16%*)
Chest pain	8 (*13%*)
Dyspnœa	7 (*11%*)
Hæmoptysis	3 (*5%*)
Loss of weight	3 (*5%*)
Hoarseness	1 (*2%*)

The initial symptoms lasted from a few hours, in the case of chest pain, to twenty years in the case of cough, but no purpose would be served by trying to assess this, for some patients had merely given "a long time" as the period.

SYMPTOMS OF ESTABLISHED CASES

Cough was complained of in 64 cases (94%), usually with sputum. Figures in other series are 96% (Brooks and Lander 1938), 96% (Almansa de Cara 1945), 95% (Freeman and Heiken 1941), and 79% (Harpøth 1941).

Loss of weight was admitted by 55 patients (80%). This contrasts with 82% (Freeman and Heiken 1941), 42% (Brooks and Lander 1938), and 43% (Joress 1938). This figure reflects to some extent the poor state of nutrition and defective dietary of many older patients admitted to hospital. Harrell (1944) has stated that pronounced loss of weight is an important feature of this disease in the old as compared with younger patients, and Almansa de Cara (1945) considers that the state of nutrition is usually well maintained but may deteriorate with extreme rapidity, once the lesions become active.

Dyspnœa was complained of by 55 patients (80%) and was severe in many. It must be remembered that Glasgow is a city of tenements, which may explain this figure compared with 15% (Harpøth 1941), 42% (Joress 1938), 55% (Brooks and Lander 1938), and 68% (Freeman and Heiken 1941).

Hæmoptysis, from staining of the sputum to a loss of some ounces of blood, occurred in 20 cases (29%). Figures in other series are 17% (Joress 1938), 35% (Brooks and Lander 1938), 36% (Harpøth 1941), 46% (Freeman and Heiken 1941), 37% (Harrell 1944), and 45% (Almansa de Cara 1945).

Night-sweats occurred to a well-marked degree in 12 patients (17%). Other figures are 17% (Joress 1938), 35% (Freeman and Heiken 1941), 11% (Almansa de Cara 1945), and 8% (Brooks and Lander 1938).

Pyrexia.—In 35 cases (51%) there were definite rises in temperature varying from a continuous irregular pyrexia (usually a terminal phenomenon) to an occasional peak of a few hours' duration. Of these 35 patients 27 died in hospital. Other studies give the following incidence of pyrexia: 51% (Freeman and Heiken 1941), 14% (Harpøth 1941), 20% (Brooks and Lander 1938) and 23% (Almansa de Cara 1945).

CLINICAL FINDINGS

Radiological reports were available in 57 cases (83%). Fibroid disease was present in 29 cases (51% of those examined), and it was bilateral in 15 (26%). Active (fibrocaseous) disease, sometimes accompanied by fibroid disease elsewhere, was found in 24 cases (42%). This was bilateral in 8 (14%). Unclassified cases numbered 4. Pleural effusion was observed in 5 patients, tuberculous bronchopneumonia in 2, extensive fibrosis with mediastinal shift in 4, diaphragmatic adhesions in 1, and bronchiectasis in 1. Anthracosis with a fibroid lesion was noted in 1. Well-marked cavitation was seen in 13 patients (23%). Other series show a similar general picture, though the incidence of cavitation reported is usually higher—e.g., 28 cases out of 60 (Joress 1938).

Pulmonary Complications.—Pleural friction was detected in 9 patients (13%), and effusion developed in 5 (7%). Asthma was present in 1 case. Other series also show a low incidence of asthma—e.g., 3% (Rest 1942).

Concomitant Diseases.—Diabetes was present in 3 cases (4%). Figures in other series are 7% (Brooks and Lander 1938), 13% (Joress 1938), 11% (Freeman and Heiken 1941), and nearly 2% (Snell 1941).

Evidence of cardiovascular disease was detailed in 11 patients as follows:

Cardiac failure of different types ..	5
Auricular fibrillation	2
Paroxysmal tachycardia	1
Aortic regurgitation (syphilitic).. ..	1
Essential hypertension	2

Lesions of the central nervous system were noted 5 patients, and carcinoma of the stomach, gastric and carcinoma of the colon each occurred in 1.

Among general findings it was noted that cyanosis uncommon in the absence of heart-failure, and 29% of cases showed some degree of clubbing (Brooks and Lander's figure is 30%).

Erythrocyte-sedimentation Rate (Westergren).—The was determined in 42 cases as follows:

		No. of cases
Normal or slight increase	(under 15 mm. in 1 hr.)..	2 (5%)
Moderate increase	(over 15 mm. ,, ,,)..	9 (21%)
Considerable increase	(over 40 mm. ,, ,,)..	23 (55%)
Extreme increase	(over 80 mm. ,, ,,)..	8 (19%)

In moderate degrees of anæmia this method is reasonably accurate. There is a tendency for the E.S.R. to rise in old age in the apparently healthy. Almansa de Cara (1945) found readings of 5–80 mm. (Westergren), 75% of cases being over 25 mm.

Hæmatological Findings.—A degree of anæmia was usual but not universal. Hæmoglobin levels ranged from 5·5 g. to 15·5 g. per 100 ml., the average level being 11·9 g. (A reduced Hb level may be found in the aged with, so far as can be ascertained, no organic disease. Levels of 12·65 g. in men and 11·7 g. in women have been reported by Newman and Gitlow (1943) and 12·9 g. by Fowler *et al.* (1941). Their figures appear to correspond with the normal found in the aged in hospital practice in Glasgow in our experience.) Where complete blood examination was carried out, the anæmia was normochromic, except in some patients with greatly reduced Hb levels, when a hypochromic microcytic anæmia was found.

SUBSEQUENT HISTORY

The outcome in this series was as follows:

	No. of patients	*Sputum positive*	*Sputum negative*
Died	41 ..	21 ..	20
In status quo.. ..	6 ..	3 ..	3
Improved	20 .	8 ..	12
Still in hospital ..	2 ..	2	

DISCUSSION

No treatment beyond rest and symptomatic measures was given. Though in some reported series a more active treatment was attempted, the consensus of opinion appears to be that in the main these are not cases suited to drastic measures. Collapse therapy, for instance, is seldom desirable. Almansa de Cara (1945) cites successful cases of artificial pneumothorax at the ages of 52, 57, and 62, but admits that it is not usually well tolerated. Amberson (1943) considers that there may sometimes be a place for surgical measures.

There appears to be no prospect of getting these patients into sanatoria at present, though many of Brooks and Lander's (1938) patients did in fact go on to sanatoria. It is of no use today to be content to say that the future of the country lies with the young, and to leave the older tuberculous patients to their own devices. Apart from other considerations, which are many and important, the welfare of infants, children, and adolescents may be greatly imperilled. While the aged patients are in general wards, some attempt must be made to isolate them, but even this is sometimes difficult, as will be appreciated by anyone with experience of ward work with a large number of the older sick.

Pulmonary tuberculosis in the old is usually of insidious onset and may be completely masked by other disabilities, or often ignored until either an intercurrent illness or a sudden increase in activity of the tuberculosis leads to an illness which may, even at this stage, be treated as nothing out of the ordinary in an aged person. In such cases pulmonary changes may be gross before tuberculosis is diagnosed. The applicability of certain necropsy findings to this country may be disputed—e.g., reeman and Heiken's (1941) series contained a large inority of negroes—but it is clear that large-scale vestigation of the older sick would reveal a surprisingly rge number of tuberculous patients, about half of whom robably would have active lesions, and well over alf would have positive sputum. Isolation of these atients is impossible. Many can undoubtedly remain their homes with certain safeguards, but the establish- ent of separate communities might have to be onsidered.

Fibroid cases may become active, and routine periodical adiological examination of established cases, especially here sputum-positive, should be possible.

SUMMARY

More attention should be directed to the problem of ulmonary tuberculosis in the old, which is often an ctive process with a high proportion of sputum-positive ases.

The onset is insidious, and the symptoms are commonly scribed to old age.

Cases appear to be commoner among men than among women.

Of a series of 60 men and 9 women, diagnosed in general wards, half had positive sputum—a low estimate. In 5 necropsies a wide variety of tuberculous disease was seen.

Cough, loss of weight, and hæmoptysis were the principal symptoms. Radiological findings corresponded to those reported for larger series by other workers, fibroid phthisis being present in half the cases. A raised erythrocyte-sedimentation rate and anæmia were usual.

Acknowledgements are due to the late Prof. Noah Morris for his interest and advice; Dr. A. Slessor for criticisms; Dr. A. D. Briggs for his interest and facilities to examine past case-records and to Dr. F. E. Reynolds for bacteriology and access to post-mortem records.

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"... In all this matter of the English national tradition we are still living on capital, for tradition is not dissipated in one generation or two. But we have quite obviously in the last forty years erected a general structure designed for a proletariat of irresponsible individuals, seeing how easily they can, as individuals, get by, whereas the older tradition impressed on people from a very early age that they must expect to depend upon their own exertions. This self-reliance was the essential complement of a spirit of independence towards the Government, for the worst possible combination is that of which the old Roman writers complained so much, of the Roman crowd at once expecting to be carried, dependent, and yet intractable. Bismarck, who knew his people, made them dependent and more tractable than ever. But the English tradition was until this century just the opposite, of men who stood firmly, and rejoiced to stand, on their own feet; and yet, almost unobserved, it has been abandoned and reversed."—Mr. DOUGLAS WOODRUFF, in *Soundings*, July, 1948.

REFRIGERATED AUTOGENOUS SKIN GRAFTING

A REVIEW OF 50 CASES

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THREE papers recording the results of clinical trials of refrigerated skin-grafts have been published in recent years. Webster, of New York, began refrigerating skin-grafts in 1932 but did not publish his results until 1944. He records the results of 36 trials of refrigerated grafts, some being autografts, some homografts, some full-thickness, and some split skin-grafts. In general, he showed that it was practicable to keep skin alive by refrigeration and that split skin-grafts showed a better take than full-thickness skin-grafts. Strumia and Hodge (1945) experimentally grafted skin which had been stored at temperatures ranging from −20 to −25°C for periods up to 61 days with satisfactory results. Matthews (1945) used refrigerated grafts of various thicknesses, though none were of the full-thickness type. He used the method of Young and Favata (1944) of contact coagulation for the fixation of his grafts, and states that "when the first dressings were taken down, the grafts were found to have taken satisfactorily"; he publishes some impressive photographs to support his statement.

Since Matthews (1945), de Martigny (1913), and Carrel (1912) have commented on the apparent increased vitality of refrigerated grafts as compared with normal skin, it was decided to try to graft infected areas with refrigerated skin. This paper reports the results of the first 50 applications of refrigerated grafts stored by a simpler method than has previously been described, and applied to both "clean" and infected granulating areas.

Both Webster and Matthews used an ordinary refrigerator to store the skin at a temperature of 3–6°C. It was felt that, if possible, the temperature for storage should be constant, and hourly readings for 24 hours were taken in various parts of two ward refrigerators which were in constant use. It was found that there

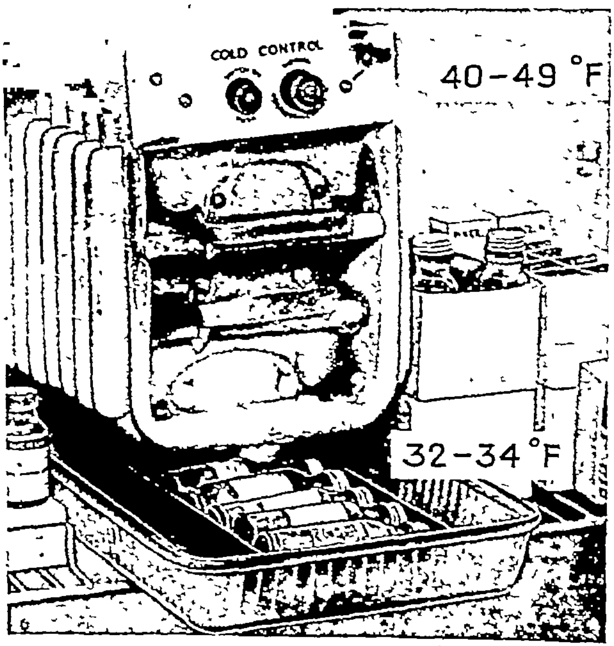

Fig. 1—Position of storage of skin-grafts in refrigerator.

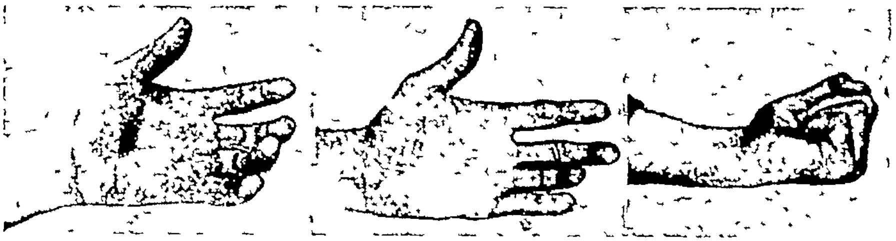

Fig. 2—Clean electric burns treated with refrigerated skin-grafts (case 1).

was a variation of 9°F (40–49°F) over 24 hours in the area adjacent to the cooling coil. However, the area inside the dish placed to collect drops from the condensed moisture on the coil did not show a variation greater than 2°F (32–34°F). This area was therefore selected for the storage bottles (fig. 1).

Webster stored his grafts by wrapping the skin in 'Pliofilm' sheets and then in two sterile towels, the package being labelled and left in the refrigerator.

This method of storage was rejected as being too bulky, and a modification of the method described by Matthews was adopted. He recommended that the graft should be folded with its raw surfaces opposed, wrapped in a piece of tulle gras, and this in turn in a piece of gauze tightly wrung out of normal saline. It was to be held away from the small amount of fluid which collected in the bottle by inserting a ring of rubber tubing or lead foil for it to rest on.

In my method the graft is spread on tulle gras and folded in half with its raw surfaces opposed. The graft sandwiched between tulle gras is now placed on a fresh square of tulle gras and rolled tightly up into a cylinder, each end being twisted once or twice, toffee-paper fashion. The cylinder is placed in an ordinary 20 ml. screw-topped glass pathological specimen-bottle. Saline gauze can be safely discarded from the technique of skin preservation, any additional moisture being unnecessary and possibly even harmful.

The risk of drying of the graft can be eliminated if the tightly rolled cylinder is pulled between the finger and thumb a few times, thereby spreading the excess of soft paraffin over the surface to form an enveloping greasy coat.

CLINICAL APPLICATIONS

The 50 applications of skin were performed on 17 patients with various lesions. No attempt was made to select cases other than to choose, if possible, chronically infected granulating areas. The lesions grafted consisted of:

	No. of cases	No of applications
Burns:		
Thermal	7	18
Electric	2	10
X-ray	1	2
Failed Thiersch grafts	4	14
Traumatic full-thickness skin loss	2	5
Varicose ulcer	1	1

The patients were aged
years, and most of them
male.

All the grafts were of the
skin type cut whenever po
with the same knife adjusted
the same thickness. Before
cation the grafts were al
cut into squares of side 1
(or multiples of 1 cm.) so t
by using a graft of co
size, percentage takes could
more accurately assessed. All grafting was done in th ward as a bedside dressing.

When required for use the bottle was taken from store, the tulle gras unrolled with full sterile precaution the requisite amount of skin cut off, and the remainde immediately rolled up and put back in the refrigerato before the application of skin. A bacteriological swa was always taken from the recipient area before grafting and a penicillin-sulphathiazole powder was usuall applied to the area before the placing of the graft The grafts were placed directly on the granulating are with no additional means of fixation, and a saline gau cotton-wool pressure dressing was invariably applied

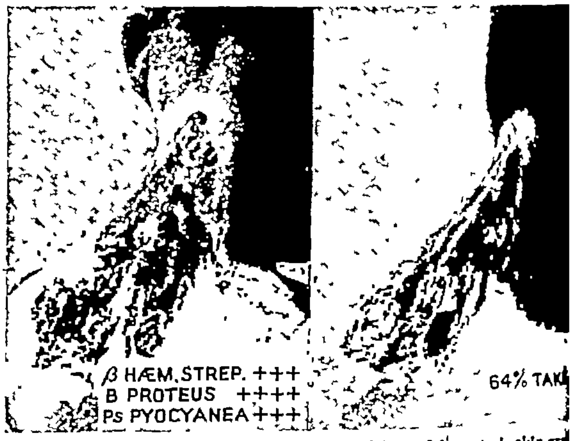

Fig. 3—Infected X-ray burn treated with refrigerated skin-gr (case 2).

Grafts were always left undisturbed for 48 hours and we usually left 4 days before the first dressing was done

No matter how dirty was the recipient area, t exudate was wiped away, and any sloughs present we cut down to a bleeding base wherever possible. Ma of the cases yielded only *Staph. pyogenes* and diphthero on culture, and would therefore not be regarded infected in the sense that the take of fresh grafts mig be affected; β-hæmolytic streptococci, *Proteus vulgar* and *Ps. pyocyanea* were all regarded as infecting organis and one or more of these organisms were present 20 of the 50 cases reported.

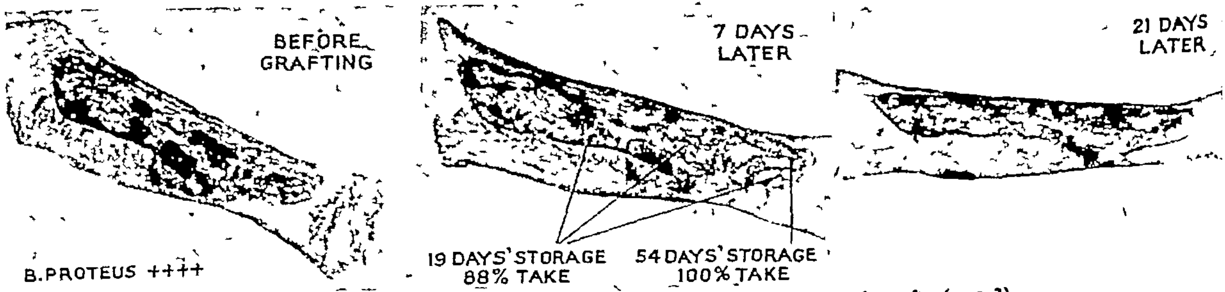

Fig. 4—Filariasis, infected by B. proteus, treated with refrigerated skin-grafts (case 3).

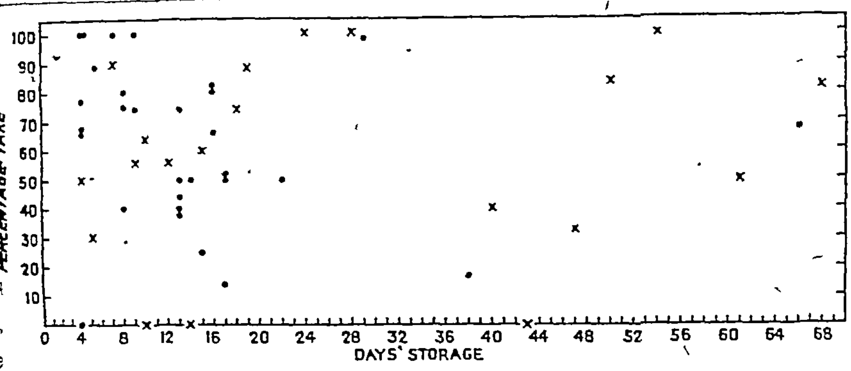

Fig. 5—Scatter graph showing percentage take of refrigerated skin-grafts plotted against storage time: •, grafts on "clean" areas; x, grafts on infected areas.

ILLUSTRATIVE CASE-RECORDS

Case 1 (clean case).—Electric burns from grasping a 2,000 V electric grid cable. Deep burns with tenacious sloughs involving the tendon sheaths of the 2nd and 3rd digits and exposing the tendons of the 4th and 5th digits. Treated with 5% 'Milton' irrigations in a Bunyan-Stannard envelope. Later, primary grafting to granulations at periphery of burns and excision of sloughs. Refrigerated skin applied to remaining areas as granulations appeared. After four months' manual labour there is some contraction, but the refrigerated skin is durable (fig. 2).

Case 2 (infected case).—Necrosis of three years' duration following X-ray therapy for spondylitis ankylopoietica. In fig. 3 the illustration on the left shows the result produced by fresh grafting the whole ulcer area. That on the right shows the result obtained by a single application of skin taken and stored at the time of the first grafting operation.

Case 3 (infected case).—Elephantiasis (*Filaria bancrofti*) treated by excision of skin and subcutaneous tissue and by massive sheet grafting. Moth-eaten appearance due to *B. proteus* infection. The illustrations (fig. 4) show the result obtained by refrigerated grafting.

RESULTS

In all "infected" cases it was considered economical to try grafting, and in only 3 did the skin totally fail to take. Three cases yielded 30%, 33%, and 40% take, but the remainder showed a 50% take or more, 3 cases showing 100%. The "clean" cases showed percentage takes varying from 0 to 100%; three-quarters showing a 50% take or more. All total failures were explained by inadequate immobilisation of the freshly applied grafts, except in one "clean" recipient area for which no obvious explanation could be found.

The scatter graph (fig. 5) shows the percentage take plotted against storage time. The percentage take was calculated from the number of grafts applied; where only a few grafts had been applied a percentage figure is open to question, but no more accurate graphic presentation could be found.

As would be expected, the shorter times of storage yielded a higher percentage take, but even the longer times of storage yielded a satisfactory take. The skin was usually used for grafting within the first three weeks of storage, but the occasional use of skin stored after this period proved satisfactory, the longest storage time—68 days—yielding 82% take. Skin has been stored for much longer periods; even after 6 months the cut surface has been moist and the blood present has remained liquid. Histologically this skin looked normal, did not differ from other sections of stored skin, and would probably have been satisfactory if occasion had arisen for its use.

The thinner the graft the more rapidly it became vascularised from beneath. The thicker split skin-grafts usually separated into two layers, a lower adherent layer and an upper layer which separated with the tulle gras on which the graft was spread. The lower and thicker layer was usually a dead white but firmly adherent after a week's implantation. During the second week this white slough-like area showed scattered areas of vascularity, and between the 14th and 18th days became rapidly epithelised, showing by the 21st day a normal skin surface. Biopsy of this showed that the adherent mass was dermis, and epithelisation had therefore taken place by lateral spread from the deeper epithelial elements.

CONCLUSION

Though the present series is small, it is felt that this simple method of skin storage and application is justified.

The results tend to substantiate the views of other writers that refrigerated grafts possess an increased vitality, and the "infected" cases in this series show that it is economical to apply stored skin-grafts to areas to which fresh grafting is not usually carried out because of bacterial flora.

The patients have in many instances been saved repeated operations and had their hospital stay shortened by having skin available at the different times at which the recipient area became suitable for grafting.

The work was done at the Ministry of Pensions Hospital, Stoke Mandeville, and my thanks are due to the Director-General of the Ministry of Pensions Medical Services for permission to publish this paper, to Mr. Richard Battle for his help throughout the investigation, and to Mr. R. G. Mason for his help in photographing the cases.

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A STUDENT HEALTH SERVICE

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The growth of interest in the health of the university student is reflected in the recent conference at the Institute of Social Medicine in Oxford and in the publication of the papers presented there. Commenting on them The Lancet[1] said: "It has long been recognised that the welfare provisions in British universities are in many ways inadequate, and that the health and sickness of students have had too little attention." This statement is unquestionably true; but later in the same article it is said that "Of recent years a few British universities and several medical schools have started partial services; but a fully operative service, making proper provision for periodic health examination and care of sickness, has yet to be announced." This demands some modification. An effective and in many ways a comprehensive medical service has been in operation at the University of Edinburgh for 18 years, and now occupies an accepted and acceptable place in the life of the Edinburgh student community. Since this was not mentioned either at the conference or in the papers already referred to, we thought that a short account of our experience and observations of its working might be of interest and of use to other institutions contemplating the foundation of such a service.

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[1] *Lancet*, 1947, ii, 949.

HISTORY

The pioneer advocate in this country of the protection and care of student health was the late Lord Constable, whose report on the social and physical amenities of student life at the University of Edinburgh was published in 1926. The substance of this report was largely implemented by the dynamic effort and intense interest of the late J. J. M. Shaw, F.R.C.S., and a new era of student welfare was started in the University of Edinburgh at the beginning of the winter session of 1929, when a department of physical education was formed under the directorship of Colonel R. B. Campbell, O.B.E., D.S.O., M.A.

The activities of this department included a scheme for the medical examination of students by two part-time male physicians for the men and a part-time lady physician for the women. It was decided at the outset that this medical examination should be purely voluntary, and, apart from bringing it to the notice of undergraduates, the authors of the scheme made no attempt to persuade anyone to appear for examination. It was thought that, when the value of the examination came to be understood and appreciated, the numbers requesting it would gradually increase, until eventually all students would accept it as a matter of course.

Besides the routine examinations, arrangements were made for sick students to be attended in their lodgings or hostels and, where necessary, to be referred for admission to the special students' ward in the Royal Infirmary.

At its inception, the scheme was fortunate to have as principal medical officers Dr. J. K. Slater and Dr. Dorothea Walpole, and an account of the experience of the first nine years was published by Slater.[2] During this period an average of 459 students (383 men and 76 women) underwent routine medical examination each year.

In 1939 the wisdom and generosity of Sir Donald Pollock permitted a notable advance in the scope and quality of the physical education service of the university. By donating the commodious and well-equipped Pollock Institute of Physical Education he provided the organisation with two superb gymnasia, a fencing-salle, a boxing-ring, instructors' offices, changing-rooms, offices for the director of physical education, and facilities and premises for the medical branch of the service. During the war the scheme could not come to full fruition, but the care of student health was maintained: an average of 360 men and 50 women were examined each year, and sick students continued to obtain medical attention in their lodgings and at the Royal Infirmary.

At the end of the war Colonel C. M. Usher, D.S.O., O.B.E., succeeded Colonel Campbell as director of the department of physical education, and a department of student welfare services was inaugurated, with Major C. H. J. Deighton as director.[3]

OBJECTS OF THE MEDICAL SERVICE

The authors of the scheme have had six principal objects in mind since the inception of the medical service:

(1) To obtain by routine medical examination at the beginning of the first academic year an accurate estimate of the physical state of each student entering the university.

(2) To advise and treat students found at the routine examination to be not wholly fit.

(3) To encourage students to undergo routine medical examination in each of their undergraduate years.

(4) To create an efficient consultative and domiciliary medical service to advise and treat students requiring medical attention.

(5) To interest the students in the importance of phy education and recreation as an essential part of their curriculum.

(6) To obtain data concerning the health of the and to assess the effects of the various strains and (mental, environmental, nutritional, &c.) to which they subjected.

ROUTINE MEDICAL EXAMINATION

Under the present arrangement every student on matriculation is expressly invited to undergo routine medical examination and radiological examination (min radiography) of the chest. Any student on subsequent matriculation may request re-examination. Radiological examinations are carried out on 75 men and 48 women students each Wednesday afternoon or Saturday morning. The following week, when the reports of these examinations are available, a clinical examination is conducted at the medical department of the Pollock Institute, or at the Women's Union. Fifteen male students are examined each evening and the findings recorded on special cards. In this way two part-time physicians have been able to carry out 1000 routine examinations on men students, as well as to give service to rather more than 600 students requiring advice and treatment, in an academic year. For women students there are three part-time physicians: the additional physician has been accustomed to look after the health of the students in some of the women students' hostels.

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(4) *Students with Psychological Difficulties.*—Anxiety states are encountered in 7% of students examined. Many anxieties can be removed at this interview. As a result of the close liaison with the department of student welfare services, the student who is unsettled through domestic or social difficulties—e.g., unsuitable lodgings—can be given appropriate assistance. Those in which the psychological problems are more deep-rooted are referred to the psychiatrist at Jordanburn Nerve Hospital and Psychological Institute.

COMPULSION

Compulsory medical examination of all students has been advocated in some quarters, and some of the representatives of the British Medical Students Association have been agitating for the adoption of this measure. As medical examiners, however, we would be most unwilling to examine any person who does not wish it, and, in relation to university undergraduates, any question of compulsion in this respect becomes all the more distasteful. It is worth while recalling Sir Walter Raleigh's words when war was made the excuse for imposing restrictions at Oxford: "A certain amount of freedom to go wrong is essential in a university where men are *learning not to* obey but to choose."

We are satisfied with the results afforded by the voluntary system in use here. In the academic year

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[2] Slater, J. K. *Edinb. med. J.* 1940, 47, 32.

[3] A diagram illustrating its present organisation may be had on application to THE LANCET office.

946–47 1536 invitations for routine medical examination were sent out, and 1140 students accepted. It seems ikely that by carrying out the examinations at appointed imes which are convenient for the individual students we could ensure that almost 100% of students would voluntarily present themselves for examination.

CONSULTATIVE AND DOMICILIARY MEDICAL SERVICE

Separate consulting-rooms are available for men and women students—for men in the medical department of the Pollock Institute of Physical Education, and for women at the Women's Union. Any student requiring medical advice or treatment may attend at the consulting sessions, which are conducted during an afternoon hour on Mondays, Wednesdays, and Fridays. Records of each student are kept.

Any student requiring medical attention in lodgings or in a hostel notifies the director of student welfare services and is thereafter visited and treated. If conditions are unsuitable for proper care and nursing, or if the disorder warrants admission to hospital, the student is transferred to the students' ward. Between May 1 and Dec. 15, 1947, 456 men and 128 women students used this service. The disabilities encountered were as follows:

	Male	*Female*	*Total*	*Percentage*
Skin diseases	65	19	84	14·2
Functional disorders ..	69	11	80	13 7
Respiratory	61	13	74	12·7
Ear, nose, and throat ..	47	19	66	11·3
Traumatic and orthopædic	62	3	65	11·1
Ophthalmological ..	32	14	46	7·9
Alimentary	28	11	39	6·7
Genito-urinary	22	7	29	5 0
Minor surgery	21	7	28	4·8
Psychological	15	4	19	3·2
Dental	16	1	17	2·9
Chilblains	0	10	10	1·7
Rheumatic	4	3	7	1·2
Pulmonary tuberculosis ..	6	0	6	1·0
Endocrine	1	3	4	0·7
Blood diseases	1	3	4	0·7
Infectious diseases ..	3	0	3	0·5
Vitamin deficiency ..	2	0	2	0·3
Glandular tuberculosis ..	1	0	1	0·2
Total ..	456	128	584	

The high incidence of functional disorders is no doubt a reflection on the somewhat unnatural existence of university students. Considerable patience is required in dealing with this type of disorder, and every facility must be available for excluding organic disease as a basis for symptoms.

HOSPITAL FACILITIES

For many years the Edinburgh Royal Infirmary has made special provision for the treatment of undergraduates in a unit consisting of four small wards to accommodate a total of 10 students. With the increased number of undergraduates at the university there are occasions, especially at the end of term, when there are insufficient beds to cope with the demands. This unit has accommodated an average of 181 students each year. From our experience it seems necessary to have 5 beds per 1000 students to meet the demands for admission to hospital.

From Jan. 1, 1934, to Jan. 1, 1948, 2538 students (1912 men and 626 women) have been admitted to this unit with the following ailments:

		Cases
Boils, carbuncles, cellulitis, &c. ..		132
C.N.S.:	Psychological ..	28
	Degenerative ..	9
	Inflammatory ..	26
Circulatory:	Vasomotor ..	7
	Varicose veins, hæmorrhoids, &c. ..	32
	Thrombophlebitis ..	7
	Rheumatic carditis ..	12
Dental ..		46
Dermatological:	Septic infections ..	24
	Dermatitis ..	17
Endocrine:	Diabetes ..	12
	Thyroid disorders ..	7
Ear, nose, and throat:	Tonsillitis ..	93
	Sinusitis (no operation) ..	30
	Otitis ..	28
	Tonsillectomy ..	358
	Submucous resection ..	118
	Antrostomy, mastoidectomy, &c.	65
Gastro-intestinal:	Gastritis, gastro-enteritis, &c. ..	67
	Peptic ulcer (including operations) ..	57
	Appendicectomy ..	291
	Other operations ..	8
	Infective hepatitis ..	35
	Amœbiasis ..	4
Gynæcological ..		49
Infectious diseases ..		21
Miscellaneous ..		193
Neoplastic (benign and malignant) ..		24
Ophthalmological ..		12
Respiratory:	Acute coryza ..	6
	Influenza ..	37
	Bronchitis ..	42
	Pneumonia ..	35
	Asthma ..	15
	Pleurisy ..	17
	Pulmonary tuberculosis ..	21
Rheumatic disorders ..		38
Urogenital tract ..		114
Traumatic:	Soft tissue ..	247
	Fracture ..	85
Herniotomy ..		64

These figures show that the bulk of the work is surgical, and, of the special departments, the ear, nose, and throat greatly exceeds all others in the number of demands on its services. Among the 193 "miscellaneous disorders" there were 22 cases of pilonidal sinus (15 males and 7 females). Among the 247 cases of trauma affecting soft tissues, no less than 49 required meniscectomy. Almost all the traumatic cases resulted from athletic pursuits. A total of 332 cases under this heading is a comparatively large figure when one considers that not more than 25% of students of this university take part in athletics. The services of all members of the honorary staff of the hospital are available to students. Besides the inpatients in this ward, many students are investigated as outpatients.

PULMONARY TUBERCULOSIS

Students found to have pulmonary tuberculosis are referred for review to the professor of tuberculosis, but we have usually encountered difficulty in arranging their correct disposal. The local authority of the student's home usually refuses to accept responsibility, which legally devolves on the tuberculosis officer of the area in which the patient is residing when the infection is recognised. The M.O.H. for Edinburgh has accepted this responsibility, but beds are seldom available in the town sanatoria for such students. The accommodation of tuberculous students is part of the national problem of the shortage of tuberculosis beds and trained nurses. It would be preferable if there existed in this country a small sanatorium attached to the professorial unit of some university for treatment of tuberculous undergraduates from all universities. In such circumstances facilities could be developed for the continuation of studies.

FUTURE DEVELOPMENTS

It seems likely that the introduction of the National Health Service may render necessary some modification of the student health service. In the light of our experience in the working of the Edinburgh service, however, we have come to accept certain principles which must be followed if the service is to be efficient, successful, and popular with the students:

(1) The student expects to get medical advice from physicians of recognised ability and standing. If this is not available, he will prefer to obtain medical services from practitioners outside a university medical service.

(2) The recognition of disease in its earliest stages during routine medical examination requires judgment based on medical erudition and wide clinical experience. It is a student *health* service that is required; therefore it is essential that disorders be recognised in the earliest

interest and of use to other institutions contemplating the foundation of such a service.

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[3] A diagram illustrating its present organisation may be had on application to THE LANCET office.

946–47 1536 invitations for routine medical examination were sent out, and 1140 students accepted. It seems likely that by carrying out the examinations at appointed times which are convenient for the individual students we could ensure that almost 100% of students would voluntarily present themselves for examination.

CONSULTATIVE AND DOMICILIARY MEDICAL SERVICE

Separate consulting-rooms are available for men and women students—for men in the medical department of the Pollock Institute of Physical Education, and for women at the Women's Union. Any student requiring medical advice or treatment may attend at the consulting sessions, which are conducted during an afternoon hour on Mondays, Wednesdays, and Fridays. Records of each student are kept.

Any student requiring medical attention in lodgings or in a hostel notifies the director of student welfare services and is thereafter visited and treated. If conditions are unsuitable for proper care and nursing, or if the disorder warrants admission to hospital, the student is transferred to the students' ward. Between May 1 and Dec. 15, 1947, 456 men and 128 women students used this service. The disabilities encountered were as follows:

	Male	*Female*	*Total*	*Per-centage*
Skin diseases	65	19	84	14·2
Functional disorders	69	11	80	13·7
Respiratory	61	13	74	12·7
Ear, nose, and throat	47	19	66	11·3
Traumatic and orthopædic	62	3	65	11·1
Ophthalmological	32	14	46	7·9
Alimentary	28	11	39	6·7
Genito-urinary	22	7	29	5·0
Minor surgery	21	7	28	4·8
Psychological	15	4	19	3·2
Dental	16	1	17	2·9
Chilblains	0	10	10	1·7
Rheumatic	4	3	7	1·2
Pulmonary tuberculosis	6	0	6	1·0
Endocrine	1	3	4	0·7
Blood diseases	1	3	4	0·7
Infectious diseases	3	0	3	0·5
Vitamin deficiency	2	0	2	0·3
Glandular tuberculosis	1	0	1	0·2
Total	456	128	584	

The high incidence of functional disorders is no doubt a reflection on the somewhat unnatural existence of university students. Considerable patience is required in dealing with this type of disorder, and every facility must be available for excluding organic disease as a basis for symptoms.

HOSPITAL FACILITIES

For many years the Edinburgh Royal Infirmary has made special provision for the treatment of undergraduates in a unit consisting of four small wards to accommodate a total of 10 students. With the increased number of undergraduates at the university there are occasions, especially at the end of term, when there are insufficient beds to cope with the demands. This unit has accommodated an average of 181 students each year. From our experience it seems necessary to have 5 beds per 1000 students to meet the demands for admission to hospital.

From Jan. 1, 1934, to Jan. 1, 1948, 2538 students (1912 men and 626 women) have been admitted to this unit with the following ailments:

		Cases
Boils, carbuncles, cellulitis, &c.		132
C.N.S.:	Psychological	23
	Degenerative	9
	Inflammatory	26
Circulatory:	Vasomotor	7
	Varicose veins, hæmorrhoids, &c.	32
	Thrombophlebitis	7
	Rheumatic carditis	12
Dental		46
Dermatological:	Septic infections	24
	Dermatitis	17
Endocrine:	Diabetes	12
	Thyroid disorders	7
Ear, nose, and throat:	Tonsillitis	93
	Sinusitis (no operation)	30
	Otitis	28
	Tonsillectomy	358
	Submucous resection	118
	Antrostomy, mastoidectomy, &c.	65
Gastro-intestinal:	Gastritis, gastro-enteritis, &c.	67
	Peptic ulcer (including operations)	57
	Appendicectomy	291
	Other operations	8
	Infective hepatitis	35
	Amœbiasis	4
Gynæcological		49
Infectious diseases		21
Miscellaneous		193
Neoplastic (benign and malignant)		24
Ophthalmological		12
Respiratory:	Acute coryza	6
	Influenza	37
	Bronchitis	42
	Pneumonia	35
	Asthma	15
	Pleurisy	17
	Pulmonary tuberculosis	21
Rheumatic disorders		38
Urogenital tract		114
Traumatic:	Soft tissue	247
	Fracture	85
Herniotomy		64

These figures show that the bulk of the work is surgical, and, of the special departments, the ear, nose, and throat greatly exceeds all others in the number of demands on its services. Among the 193 "miscellaneous disorders" there were 22 cases of pilonidal sinus (15 males and 7 females). Among the 247 cases of trauma affecting soft tissues, no less than 49 required meniscectomy. Almost all the traumatic cases resulted from athletic pursuits. A total of 332 cases under this heading is a comparatively large figure when one considers that not more than 25% of students of this university take part in athletics. The services of all members of the honorary staff of the hospital are available to students. Besides the inpatients in this ward, many students are investigated as outpatients.

PULMONARY TUBERCULOSIS

Students found to have pulmonary tuberculosis are referred for review to the professor of tuberculosis, but we have usually encountered difficulty in arranging their correct disposal. The local authority of the student's home usually refuses to accept responsibility, which legally devolves on the tuberculosis officer of the area in which the patient is residing when the infection is recognised. The M.O.H. for Edinburgh has accepted this responsibility, but beds are seldom available in the town sanatoria for such students. The accommodation of tuberculous students is part of the national problem of the shortage of tuberculosis beds and trained nurses. It would be preferable if there existed in this country a small sanatorium attached to the professorial unit of some university for treatment of tuberculous undergraduates from all universities. In such circumstances facilities could be developed for the continuation of studies.

FUTURE DEVELOPMENTS

It seems likely that the introduction of the National Health Service may render necessary some modification of the student health service. In the light of our experience in the working of the Edinburgh service, however, we have come to accept certain principles which must be followed if the service is to be efficient, successful, and popular with the students:

(1) The student expects to get medical advice from physicians of recognised ability and standing. If this is not available, he will prefer to obtain medical services from practitioners outside a university medical service.

(2) The recognition of disease in its earliest stages during routine medical examination requires judgment based on medical erudition and wide clinical experience. It is a student *health* service that is required; therefore it is essential that disorders be recognised in the earliest

stages, when curative measures are most likely to be effective.

(3) There is always a small proportion of the students with some acute or potentially serious illness. It is unquestionably the university's responsibility to ensure that the quality of the medical advice available on these occasions is of the highest standard, and that the student is not exposed to any risk resulting from inexperience of the medical staff. These considerations have, until now, been fulfilled by the appointment (on a part-time basis) of physicians on the staff of the teaching hospital, who are either Fellows or Members of the Royal College of Physicians of Edinburgh. Since the range of clinical material arising from morbidity among the students is comparatively restricted, the physicians doing the work of this service should have access to wider fields of clinical medical practice if they are to maintain a high standard of clinical efficiency. For this reason the appointment of part-time physicians must be strongly recommended.

(4) An important feature of our service hitherto has been the close cooperation between the medical staff and the directors of physical education and of student welfare. It is therefore an advantage if the members of the medical staff carrying out routine medical examinations have a keen interest in physical culture, athletics, social welfare, and the theme of positive health.

(5) A part-time psychiatrist who would conduct sessions at the medical centre would be of considerable advantage.

(6) A medical officer interested in the social aspects of student life and working in close liaison with the department of public health and social medicine could undertake sociological investigations and would have the opportunity of collecting data about the physical and mental aspects of student health from the students and from his clinical colleagues.

CONCLUSION

The University of Edinburgh has conducted a comprehensive student medical service for nearly 20 years.

A brief account is given of its history, the scope of the work it undertakes, and the possible developments.

ACUTE BENIGN DRY PLEURISY

SIX CASES IN A HOSPITAL STAFF

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UNDER the name, acute benign dry pleurisy, Scadding (1946) described 20 cases of a syndrome which in some ways resembled Bornholm disease but differed from it in that gross dry pleurisy was present. The cases were all seen in the Suez Canal area. In England Williamson (1924) described an outbreak of a similar condition in a London children's hospital; Lloyd (1924) reported 5 cases among the nurses of The Hospital for Sick Children, Great Ormond Street; and Attlee et al. (1924) reported 48 cases, 17 of them with a pleural rub, in a boy's school.

The disease reported by Pickles (1933), Carter (1933), and Howard (1938) more closely resembles Bornholm disease and can therefore be excluded from a discussion of the illness described by Scadding.

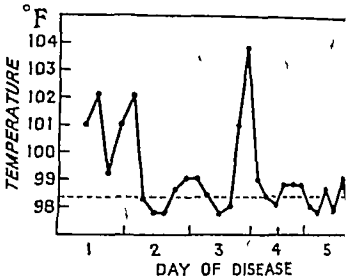
So far as can be gathered from published reports, England seems to have been free from acute benign dry pleurisy for twenty-three years. Since, however, an outbreak occurred among 5 nurses and 1 ward maid at this hospital, it was felt necessary to report it so that the existence of this disease may not be forgotten.

The first case was seen on Sept. 15, 1947, the second Sept. 16, 2 on Sept. 18, and the final 2 on Sept. 20. patients came from various wards in the hospital, no common point of association was discovered. duration of the illness from reporting sick to return work varied from seven to fourteen days, with an a of nine days.

SYMPTOMS

The following account of the subjective sensat experienced was written by one of the nurses:

Sept. 17.—Awoke with headache and stiff feeling waist up—chest and back. It gradually got worse all and developed into a severe stabbing pain which seemed to get tighter until it hurt to breathe. The pain was right round the waist and up the centre to about the 5th rib. Felt frozen and hot in turns, splitting head, eyes smarted, and temperature up 101°F. Did not sleep very well. Perspired a lot in the night.



Typical temperature chart in acute ben dry pleurisy.

Sept. 18.—Felt well. Very little pain; appetite goo Did not sleep well.

Sept. 19.—Bad headache in morning. Pains a bit wors mostly at left side, then felt O.K. till evening. Pains wors beginning over left bottom ribs and extending round to righ back. Felt cold and shivery, hot, and dry. Eyes smarted T. 103°F. Felt like death. At 2 A.M. T. 99°F. Felt col and clammy and much better.

Sept. 20.—Felt O.K. in morning. In afternoon pa gradually got worse (after laughing a bit)—still in the sam place—until it felt as if all the muscles were squeezing inwar and upwards until I had difficulty in breathing for about hour. I seemed to catch my breath as if I were tearing som thing in my chest. It was impossible to cough, sneeze, yawn during the pain. If I turned from side to side I felt if I wanted to cough. The pain always went to the si I lay on.

Sept. 21.—Did not feel too bad in morning, but at midd had a severe headache and nausea. Felt "all-in" by evenin Vomited once. Slept fairly well.

Sept. 22.—Felt O.K. less pain.

Sept. 23.—Pain worse—higher up in chest, as on first da

Sept. 24.—Pain worse—more localised across top of chest first two or three pairs of ribs. In evening breathing diffic and very painful—probably due to a good deal of laughin again. Slept very well.

Sept. 25.—Woke feeling as if someone had been jump on my chest all night. All front and back sore when breathed. Pain gradually became localised to front of ch as yesterday, and right side just outside about the 6th r and also across back above waist from right side to just pa spine. Had sick headache and pain behind eyes. A slight exertion seemed to make pain worse, especially laught

SIGNS

In 3 of the 6 cases there was dry pleurisy, one produci a palpable rub. In 5 of the cases the temperature cha was almost identical in shape (see figure). The pulse-ra was in proportion to the temperature. In 3 cases the was a mild pharyngitis at the onset of the illness; 2 of these a pleural rub subsequently developed. I case *Strep. hæmolyticus* was isolated from the thro swab. In 1 case there was an area of hyperæsthe over the left chest. All 6 patients had their chests radi graphed early and late in the illness. Changes we not seen.

LABORATORY FINDINGS

Erythrocyte-sedimentation rates taken at week intervals from the start of the illness were normal. 4 cases a full blood-count showed no change. In cases there was a neutropenia on the day of admissio to the ward: 3430 white cells per c.mm. (neutrophils 34%) in one case: and 3750 white cells per c.mm. (neutrophils 48%) in the other. Ten days later both counts were normal.

DISCUSSION

This disease is interesting for several reasons. First, the previous epidemics in this country have, with one exception, occurred in children's hospitals—the exception was a boy's school. Secondly, as Scadding (1946) has pointed out, its clinical importance lies not in the illness itself but in distinguishing it from more serious disorders. An isolated case to the unwary might possibly suggest the onset of a tuberculous pleurisy or a pneumonia. Occasionally it is associated with an eosinophilia which, in combination with the muscle pain, suggests trichiniasis. Lastly, the relationship between Bornholm disease and Scadding's acute benign dry pleurisy requires consideration. Except for the high incidence of pleurisy, in one of them, both diseases are identical. Bornholm disease is known at times to produce transient inflammation in other serous sacs, such as the pericardium.

The information available suggests that acute benign dry pleurisy is a manifestation of Bornholm disease. Therefore a better name for it might be "Bornholm disease with pleurisy."

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PREPARATION OF STREPTOCOCCAL EXTRACTS FOR LANCEFIELD GROUPING

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THE methods of extracting polysaccharide for grouping β-hæmolytic streptococci, recommended by Lancefield (1933) and Fuller (1938), have proved very satisfactory but somewhat laborious and exacting when large numbers of strains have to be tested. The chance discovery of a streptomyces that produces a potent proteolytic substance capable of liberating the C substance from β-hæmolytic streptococci suggested a simple method for the preparation of extracts for Lancefield grouping.

METHODS

Preparation of Proteolytic Factor.—Spores from the strain of *Streptomyces albus* were suspended in saline and a small volume of suspension run over the surface of an agar medium in Roux bottles. The medium contained 'Eupeptone no. 2' 0·5%, 'Yeastrel' 0·3%, dibasic sodium phosphate 0·2%, glucose 0·2%, Fildes's extract 2·5%, and shred agar 1·25%. Cultures were incubated at 30–37°C for 4–6 days. The bottles were removed to a −10°C refrigerator for 12 hours and the frozen cultures then allowed to thaw out. By this method * the bulk of the fluid in the medium was recovered from the agar gel. This fluid contained the products of the organism, one of which is an active lytic agent presumably an enzyme. The fluid, which had an initial pH of 9·0, was adjusted to pH 7·5 by adding hydrochloric acid, and was ready for use after filtration through a Seitz pad. To test the effectiveness of the filtrate, 0·1 ml. of a heavy suspension (about 4000 million organisms per ml.) of heat-killed group A streptococci was added to 0·4 ml. of the proteolytic solution in a 3 in. × ½ in. tube and the mixture was placed in a water bath at 50°C. A tube containing heated enzyme solution plus streptococcal suspension acted as control. An active lytic solution completely lysed this streptococcal suspension in approximately 30 minutes.

It will be seen that the production of the enzyme solution is simple. Its potency is high and varies little with the temperature of incubation of the streptomyces culture within the range 30–37°C. The inclusion of Fildes's extract made a notable difference to the yield of enzyme. The solution is active over the pH range 9·6–5·6; it keeps well when stored in the cold with 0·5% phenol as a preservative. At least two oxidising agents and a number of reducing agents inactivate the enzyme.

Cultures of Hæmolytic Streptococci.—Strains submitted, whether from throat swabs or subcultures of strains already isolated, were spread on segments of a blood-agar plate and incubated overnight.

Preparation of Streptococcal Grouping Extracts.—Into each of a series of Dreyer's tubes was run 0·25 ml. of enzyme solution and a loopful of growth taken up from the 18 hr. blood-agar culture was suspended in it. The tubes were placed in a water bath at 50°C and left until quite clear (approximately 1½ hr.). This clear solution was used to carry out the usual precipitin ring tests against the various group antisera, which were prepared in this laboratory, and results were read after 15 minutes.

RESULTS

The table shows the results obtained in the examination of 177 strains in parallel with the Lancefield or Fuller methods. With extracts made with the proteolytic solution positive reactions appeared as quickly and were at least as clear-cut as those obtained with Lancefield or Fuller methods. In fact, more positive reactions were obtained by the enzyme method than by the Lancefield or Fuller method with strains belonging to groups A, C, and G. The failures with the latter methods were probably due to slight technical errors in the preparation of the extracts, since those strains which gave positive results with the enzyme method alone subsequently gave positive reactions with fresh extracts prepared by Fuller's method. Stock cultures of most of the other Lancefield group strains have been tested: there has been no evidence of destruction of the group polysaccharide by the lytic agent and no non-specific reactions have been observed.

Some strains of streptococci, when used as living suspensions, were resistant to the lytic action of the extract. Among strains so far tested, groups D and K and many α-hæmolytic streptococci show this tendency. In general the resistant strains appeared to be largely streptococci showing α-hæmolysis on blood agar, and a number of others showing some β-hæmolysis but not yielding a soluble hæmolysin. The possibility of using this phenomenon for distinguishing hæmolytic from

REACTIONS OF GROUP ANTISERA WITH STREPTOCOCCAL EXTRACTS PREPARED BY (*a*) THE ENZYME METHOD, (*b*) THE LANCEFIELD OR FULLER METHOD.

Strain classification	No. of strains tested	No. giving positive reactions	
		Enzyme method	Lancefield or Fuller method
Group A	70	70	62
,, B	7	7	7
,, C	26	26	19
,, D	3	3	3
,, F	7	7	7
,, G	19	19	17
Doubtful strains submitted for examination	37	Nil	Nil
Lactose-fermenting viridans strains	8	Nil	Nil
Totals	177	132	115

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[*] This method was suggested to me by Mr. G. V. Heimer, who uses it to extract and concentrate staphylococcal bacteriophage.

non-hæmolytic strains is under investigation. For the preparation of extracts of such resistant strains, the colonies are first suspended in a drop of saline in the Dreyer's tube, the tubes are immersed in boiling water for 3–4 minutes and cooled; and the enzyme solution is then added. Lysis takes place within a reasonable time.

DISCUSSION

That some streptomyces produce lytic substances is common knowledge, but their action in liberating C substances from hæmolytic streptococci does not appear to have been described previously. The present method, which utilises this property, has proved successful for the identification of members of Lancefield groups A, B, C, and G during large-scale streptococcal surveys and routine grouping of strains from acute cases.

Clearly a greater and more varied collection of strains must be tested by this method in parallel with the Lancefield or Fuller method before its reliability can be assessed. Though it is not claimed that the method gives better extracts than the two in general use, it does reduce the labour and care required by eliminating the need for centrifugation and neutralisation which are so time-consuming. The resistance of certain strains to lysis is no doubt a disadvantage in some cases, but in clinical and public-health laboratories the main need is to identify streptococci of groups A, B, C, and G, and so far all strains belonging to these groups have been lysed and successfully grouped by this method.

SUMMARY

A simple method of producing a strong proteolytic factor—presumably an enzyme—from a streptomyces is described. Preliminary investigations show that it can be used for extracting the polysaccharide C substance from streptococci of groups A, B, C, and G, and that for this purpose it is quicker than either the Lancefield or the Fuller method of group determination.

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RENAL TUMOUR AND PERSISTENT FEVER

REPORT OF A CASE

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In view of the report by Catlin et al.[1] of two cases in which the presenting symptom of hypernephroma was long-continued fever, the following case is of interest.

A man, aged 45, had had “influenza” a year previously. On the first day his temperature had reached 102°F, and in the following week 99–99·5°F, but evening pyrexia had persisted for the whole year, accompanied by slight rigors. The patient had been able to get about and continue his occupation. He had not had any pain or any urinary trouble, and repeated examinations of urine had not disclosed any abnormality. Extraction of four diseased teeth and tonsillectomy for chronic tonsillitis had not cured pyrexia. The patient had gradually become anæmic and weak.

His doctor, suspecting intoxication by hair-dye used in the patient's occupation had injected sodium thiosulphate without effect; in fact the temperature had risen above 100·5°F for a few days. Malaria had been excluded but *Staph. aureus* had been cultured from the blood. For this reason penicillin treatment, already started, had been continued to a total of 33,000,000 units.

Because of progressive anæmia several blood-transfusions had been given. The temperature had not fallen but had become intermittent, and on the days of remission pus appeared in urine. The patient was therefore admitte hospital.

On admission the patient was emaciated, with gr skin, and was unable to walk. The kidneys were not palp the left costovertebral angle was full; there was no tende in the lumbar regions. A varicocele was present on th side.

Urine: traces of albumin; pus abundant, leucocyte occasional erythrocytes and granular casts; staphyloc no tubercle bacilli.

Blood: red cells 2,440,000 per c.mm., Hb 40%; white 8800 per c.mm. Blood-pressure 130/65 mm. Hg; erythro sedimentation rate 110 mm. in 1 hr.

Chromocystoscopy: normal vesical mucosa and ure orifices; intravenous indigo appeared after 4 min. on right side, but none had appeared after 25 min. on the left

Ureteric catheterisation was easy on the right side but diff on the left; the urinary sediment showed no abnormaliti

Radiography.—Left kidney irregular and enlarged later Retrograde pyelography showed renal pelvis and one c greatly dilated and pelvis displaced caudally; other ca compressed; ureter one finger-breadth wide.

From these findings a renal tumour was diagnosed operation was decided on.

Nephrectomy.—A tumour about 6 in. in diameter removed, which on histological examination proved to hypernephroma.

Progress.—Penicillin 200,000 units daily was given five days. After the wound had healed, radiotherapy applied. The patient's general condition quickly impro his pyrexia disappeared on the third day, and he was charged from hospital, with his wound healed, on the n day. Three months later he was in good condition, co walk, and had begun to put on weight.

DISCUSSION

During his illness this patient had no pain and urinary trouble; nor did he observe any tumour in abdomen. His only symptoms were progressive ema tion, anorexia, and evening pyrexia, which remai unexplained for a year. The pyrexia was mainta by the production of toxins by necrosis and infectio the tumour. No functioning renal parenchyma found. The ureter was completely occluded by ma from the necrotic tumour, and only in the last few w did pus appear in the urine.

Israel[2] called attention to the fact that fever often the only symptom of a malignant neopl Babics[3] also emphasises the importance of pyr He reported the case of a man of 43 whose first and symptom of renal tumour was evening pyrexia.

The present case lacked three cardinal sympto hæmaturia, palpable enlargement of the kidney, pain. Occlusion of the ureter prevented hæmatu The fact that the tumour occupied the upper pol the kidney made palpation difficult; tumours in lower pole are easily palpated. On radiography diaphragm usually shows a limited action owing fixation of the tumour to the diaphragm. Pain, w present, is usually dull, but sometimes, if the ur is occluded by clots, it resembles colic due to renal st It may then be differentiated from colic due to stone the fact that bleeding precedes the pain.

The secondary anæmia was imputed to the supp septic focus.

Varicocele due to compression of the spermatic v is often helpful in the diagnosis. In a late stage dil tion of the collateral veins on the abdominal wall be observed.

Renal tumours on the left side are often conf with splenomegaly; but careful urological examina should establish the correct diagnosis.

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Medical Societies

INTERNATIONAL CONGRESS OF PSYCHOLOGY

Prefrontal Leucotomy

THE symposium on prefrontal leucotomy at the 12th International Congress at Edinburgh on July 26 was to have been opened by Prof. **Kurt Goldstein**, of New York, who for many years has worked on the psychological problems of frontal-lobe function. He was prevented by illness from being present; but his paper, when read towards the end of the meeting, formed a philosophical complement to the more clinical approach of the earlier contributors. Professor Goldstein considered the main frontal-lobe defect to be the loss of what he called the "abstract attitude" towards reality; he described at length this attitude and the consequence of its loss. The attitude was the essence of man's nature, and he considered it doubtful whether it could be restored by training after it had been altered by leucotomy.

Dr. **Erwin Stengel** mentioned the empirical and drastic nature of the treatment. He pointed out that after operation it was necessary to make a distinction between changes in the symptoms of the illness and changes in the personality of the individual. Some changes, such as those concerned with energy and libido, were really quantitative although at first sight they appeared to be qualitative. As a therapy, leucotomy had its most marked effect on states of abnormal depression. The effect on schizophrenia and paranoid states was less impressive, but even here alleviation of tension in chronic cases often transformed life into one of happiness. The question of the effect of the operation on periodicity and recurrence had not yet been answered with certainty. In his experience some patients with these features were free from recurrence for longer periods after operation. Others had milder attacks and in a few there were mitigated fragments of an attack. The extent of change in personality and the individual features found depended mainly on the original personality. Not every person in possession of undivided frontal lobes was easy to live with, tactful, considerate, or deeply religious. Dr. Stengel expressed the opinion that a team of expert research-workers given the task of tracing an unknown number of leucotomy cases out of 500 ordinary people would fail to identify every such case and would find some post-leucotomy features in many who had never been near a psychiatrist. It could be concluded that quite a few ordinary people were labouring under a frontal-lobe deficit. While this emphasised our ignorance it also brought the challenge —what can we do to mobilise the dormant riches of our brains?

Dr. **G. W. Mackay** dealt with the results of leucotomy in a small series of cases in an institution for criminal mental defectives. The patients were all delinquent in varying degree, and of low intelligence; they were suffering from psychopathic states and manifest gross impulsive, violent, and self-destructive behaviour. The postoperative period ranged from six to eighteen months. The best results were obtained in cases uncomplicated by physical disorders such as epilepsy or a postencephalitic state. Of the 9 patients in this group 6 were regarded as recovered or much improved and several could be discharged from the institution. In addition, 2 patients of this type and 3 epileptic- or postencephalitic cases derived some benefit. These results were strikingly illustrated by case-histories. The speaker commented that while it had been said that after leucotomy people lost their belief in religion, regarding these defectives one would rather say that the operation had killed the devil.

Prof. **Geoffrey Jefferson**, F.R.S., was also unable to attend, but his contribution was read in his absence. From his own early work on lobectomy the writer had drawn certain conclusions, the first of which was that the frontal lobes could not be regarded, either singly or together, as the organ of the mind. Secondly, even if the total behaviour of the individual were grossly disturbed, he would, with a successful operation, be restored to normality by unilateral lobectomy. Some inferences followed. Frontal-lobe tissue was not charged very highly with function; improvement was due to disembarrassment of the rest of the brain. The behaviour of the individual depended on his fundamental personality. Permanent alterations in personality occurred only if the opposite lobe was damaged as well, if the tumour extended elsewhere, or if the whole brain had been damaged by previous high pressure. There was the strongest objection to simplifying or codifying behaviour after leucotomy. In his experience those patients did best who before becoming mentally deranged had had time to develop their personality. With the sole exception of incontinence during consciousness, all the aberrations found after leucotomy could be seen with tumours elsewhere in the brain provided the intracranial pressure was raised. Leucotomy did much to make patients useful members of society but the terms "improvement" and "recovery" should be used with caution.

Dr. **Alfred Meyer** gave an account of the anatomical and pathological aspects of leucotomy investigated at the Maudsley Hospital, where more than 90 brains from patients dying some time after the operation had been examined. In those patients who had survived upwards of six months after operation full microscopic examination by serial sections had been carried out and the connexions of the frontal lobes with the thalamus had been studied. Variability of the site of the cut was still an impressive finding. With a varying cut we were studying the effects of very different frontal lesions. Dr. Meyer found it difficult to believe, as Hebb had inferred, that personality changes after operation were due rather to irritation of the surrounding tissues than to severance of the prefrontal fibres. Postoperative changes also depended on the number of segments of the frontal white matter involved. He demonstrated an ingenious method of classifying the difference in cut according to the number of segments involved in the lesion, and thus correlated the lesion with the clinical result. Concerning the plane of the cut it could be said that cases that did badly and died within six months of operation usually had a posterior cut. The degree of personality change correlated roughly with the number of fibres severed.

Dr. **M. A. Partridge** described observations made on 57 patients suffering from affective disorders operated on by Mr. Wylie McKissock and examined at intervals of six and twelve months after leucotomy. The preoperative prognosis was poor or hopeless in all but 5 cases. Altogether 50 patients were discharged from hospital, but of these 7 relapsed. Of the 43 patients at home the great majority resumed their former functions and proved to be as efficient in their work as before their illness. Every patient showed some frontal-lobe deficit at some time. Lowering of affect and activity facilitated by a lack of restraint were the commonest findings. Most patients could conceal their defects for a short time and in front of strangers. With the passage of time improvement took place.

Dr. **W. Mayer-Gross** reported on three further studies made on the material of the Crichton Royal. The first was concerned with the so-called failures of the operation—the 68 patients who remained in hospital. The second series of observations concerned 52 patients who had been operated on by a modified technique aiming at isolation of the orbital areas only. The third investigation dealt with 11 patients and represented the follow-up of cases of periodic psychoses (periodic catatonics and manic-depressives). In the light of this material the theory that improvement was due to the production of frontal-lobe symptoms was tested. It was found that as well as cancelling out the psychosis by the production of frontal-deficiency signs, the operation by itself abolished certain undesirable psychotic features. This was particularly evident in the periodic cases where in 8 of 11 patients periodicity disappeared; while in the remaining 3 it was modified.

Post-leucotomy personality change from the point of view of a non-medical psychologist was dealt with by Mrs. A. PETRIE, who described differences found in 20 patients tested before and two to three months after operation. These subjects, suffering from severe neurosis, were accessible to a battery of tests of cognition and temperament. Findings included a shift away from neurotic introversion and a decrease in intelligence. In the post-leucotomy patient there was reduced suggestibility and a smoother work-curve. He paid more attention to speed and less to accuracy than before operation. He blamed himself less, and while living less in the past he looked more hopefully to the future. His rote memory was impaired and there was some loss of verbal ability. Learning was more difficult, but routine tasks were more easily performed. The patient was less distractible. A frequent additional factor was loss in the finer distinctions of language. Common words were misused and new words formed.

Sir DAVID HENDERSON, who was in the chair, emphasised that leucotomy should be regarded as an operation of last resort. He drew a parallel between the effect of leucotomy and the effect of the shock therapies on cases of periodic psychosis. He stressed the importance of neurological and pathological investigations, and suggested that the pathological findings described cast some doubt on the adequacy of the "blind" operative procedure in use at present.

Reviews of Books

Manual of Leprosy

ERNEST MUIR, M.D., F.R.C.S.E., medical adviser, British Empire Leprosy Relief Association. Edinburgh: E. & S. Livingstone. 1948. Pp. 208. 17*s.* 6*d.*

DESCRIBED as a small book for doctors, nurses, and lay workers, this manual says little about the history, distribution, epidemiology, and bacteriology of leprosy, its emphasis being rather on the clinical sections. It includes a simple description of prophylactic measures.

An account is given of tissue reaction and resistance and the technique of the lepromin test. The South American classification, based on histological changes, has been adopted in place of the Cairo clinical one: this will be of value to experts with time and facilities for microscopical examinations in all doubtful cases, but will present difficulties to the more numerous workers who have to base their diagnosis on clinical appearances. Clinical description on the new lines is the most valuable part of the book. Clinical and bacteriological examinations are adequately described, and prognosis discussed, stress being laid on the value of the lepromin test. Four short chapters on treatment are perhaps less satisfactory. Injections of hydnocarpus oil and esters are advised, on the usual lines, but no mention is made of intramuscular injections of sodium hydnocarpate, still regarded by some as the most active of such preparations against leprosy. The value of sulphones in lepromatous cases is brought out, and promising preliminary results are reported with the newer sulphetrone preparation in Nigeria.

Osteotomy of the Long Bones

HENRY MILCH, M.D., consulting orthopædist, Maimonides Hospital, New York. Oxford: Blackwell Scientific Publications. 1948. Pp. 294. 35*s.*

THE earlier chapters deal with the simpler types of osteotomies of the various long bones in what seems excessive detail. Dr. Milch's insistence on accurate and finical descriptions tends at first to obscure rather than clarify; but as the chapters unfold, and as the crescendo—the complicated hip osteotomies—is reached, the reader is grateful, for he now finds himself familiar with clearly defined terms and conditions without which the more advanced mechanisms and descriptions would not be understood. Dr. Milch makes no attempt to simplify the theory behind his practice, and even a little elementary reading in long-forgotten school trigonometry books—which in itself provides something of the thrill of first looking into Hogben—may prove helpful. The final chapters amply reward the patient reader, for in them the various hip osteotomies are described in great and entrancing detail.

The early chapters deal with lineal, torsional, and angulational osteotomies of the shafts of the long bones, well established in practice, though the terms and descriptions may be novel. The wide scope of the later chapters embraces angulational and pelvic support osteotomies in the treatment of fractures, tubercle, and osteoarthritis of the hip. In orthopædics these methods are increasingly used, and—being simple in practice, though complicated in theory (as readers of this book will realise)—look like replacing more complicated procedures with grafts, screws, bolts, and nails.

Acute Bacterial Diseases: Their Diagnosis and Treatment

HARRY F. DOWLING, M.D., F.A.C.P., clinical professor of medicine, George Washington University. London and Philadelphia: W. B. Saunders. 1948. Pp. 465. 32*s.* 6*d.*

THOUGH this book is mainly the work of a professor of clinical medicine, two sections on the antibiotics have been written in collaboration with Dr. L. K. Sweet, a bacteriologist, and the sections on pertussis and diphtheria have been contributed by Dr. H. L. Hirsh, a pædiatrician who is also in charge of fever beds. Acute infectious processes of other than bacterial origin are only mentioned in connexion with differential [illegible] With the advent of the sulphonamides and antibi[illegible] clinical diagnosis of the acute bacterial diseases does not suffice: it is necessary, as Professor Dowling [illegible] out, to identify the causal organism if the appropriate chemotherapeutic agent is to be prescribed. Almost identical clinical syndromes may be caused by diverse organisms, some of which are amenable to chemotherapy while others are unaffected. The clinician must therefore use the laboratory fully at all stages of the illness.

The sections describing the sulphonamides and antibiotics are clear and informative; the account of streptomycin will be particularly acceptable to British physicians who are now assured of more adequate supplies. The diagnosis and treatment of specific coccal and bacillary infections and bacterial diseases in which exotoxins are a major factor are discussed in detail. A section on the acute forms of tuberculosis, apart from the conservative assessment of streptomycin therapy, serves to remind us that this infection must always be excluded in any obscure febrile illness. Typhoid fever is discussed separately, as the sole representative of "eberthella infections," while paratyphoid fever is included in a section on salmonella infections and briefly dismissed as a "typhoidal type of bacteræmia." Indeed, the author considers that the term "paratyphoid" should be discarded, since the causal organisms "represent a small part of the *Salmonellæ* all of which produce the same clinical picture"—a statement to which few will subscribe. *Eberthella typhosa*, too, is better known as *Salmonella typhi* in this country.

It is unfortunate that "membranous croup" is regarded as a synonym for diphtheria in general, though the term still lingers in this country as descriptive of the laryngeal form. As an account of current practice the book has great merits. It is lavishly illustrated.

THE LANCET

LONDON: SATURDAY, AUGUST 14, 1948

Smaller and Better Practices

WITH varying enthusiasm, more than 20,000 doctors have agreed to take part in providing a general-practitioner service for the nation. The Minister of Health, who can scarcely have relied on so large an initial response, may now believe the new service to be fairly launched. But we hope he will nevertheless consider carefully with his advisers how this favourable situation can be turned to advantage. To borrow a metaphor from one of Mr. BEVAN's other interests, any necessary changes in pattern should be made before the metal hardens in the mould.

The maximum permitted number of patients (and with it the size of the capitation fee) was decided at a time when it seemed possible that the service would start with far fewer than 20,000 practitioners. In such circumstances the Minister no doubt felt obliged to allow a doctor to have as many as 4000 patients, despite the inadequacy of personal care which this must often imply. But today, with the average number of public patients little (if at all) above 2000 per practitioner, there is not the same evident need to put the ceiling so high. The only arguments for doing so are that it allows patients a wider choice of doctor and that it allows a proportion of doctors to earn the larger income to which their popularity and industry entitle them. All agree, however, that an unaided practitioner with 4000 patients on his list can fulfil his obligations to them only if he avoids their more time-consuming demands. He must insist on their attending his surgery; he must keep his visiting-list brief; whenever possible he must send his really ill patients into hospital; and he must delegate recurrent tasks (e.g., dressings or injections of penicillin) to district nurses or hospital outpatient departments. What is left for the doctor himself is the crowded surgery, with little time to do more than treat the presenting symptoms related by each succeeding patient.

Some may say that this is an overstatement of the position; but everyone will admit that very large lists prevent us from providing a true health service and compel us instead to provide a service for disease. For the first time in our history the practitioner now has, in theory, the chance of seeing as much of his patients as he thinks necessary: he can visit them in their homes, or ask them to call again upon him, without feeling that this will add to their financial indebtedness For the first time he is free, in theory, to be a family doctor in the full sense of the words. As such his essential function is to know his patients well, to appreciate the difficulties that affect the family as a whole, and to understand the relation of these difficulties to the circumstances in which they live. This knowledge enables him to treat individual members of the family with a minimum of disturbance to the rest, to give orders that can in fact be carried out, or to help in securing additional facilities where these are needed. He is in a position to keep an eye on anyone who may need attention without yet being ill enough to seek it. And in doing all these things well he can feel that he is doing something that really matters. However efficient and accessible the consultant and hospital services may become, the practitioner will remain necessary as the first of the medical team to be consulted, and the one in closest contact with the patient and his family. All of which means that unless general practice in the new service can be kept satisfying and attractive, we shall not get a high standard of early diagnosis and treatment and we shall thereby fall short of our best effort. Unfortunately, there is ample evidence that today more than ever of the newly qualified are seeking to specialise. Interested by the glamour attaching to consultant practice, encouraged by the assured and steadily rising income promised by the specialist Spens report, and impressed especially by the oft-repeated stories of harried, overworked, underpaid, and inefficient general practitioners, they very naturally throng the examination halls in the hope of attaining specialist status

The desire to evade or escape from general practice threatens indeed to become a danger to medicine. Yet it cannot be checked, and general practice cannot be replenished and revivified with satisfactory recruits, unless we see that the pattern now being laid down is one that appeals to the new generation. Instead we find that practitioners at present are scrambling to augment their lists, and looking askance at intending new entrants to their areas, largely because of the difficulty of earning their previous income without accepting a list of patients they know to be too large. Now that the Minister is assured of enough doctors to start the service he is in a better position to consider where exactly the public advantage lies. Clearly it does not lie in the encouragement of doctors to have lists longer than they can manage; nor in the discouragement of doctors to enter general practice because it does not provide an adequate livelihood unless abused in this way. The proportion of our medical resources (both in numbers and in brains) that ought to be employed in special and in general practice is a major question of policy; and adjustment of the remuneration and amenities obtainable in these branches should be used as a means of achieving the ends desired. So far as it goes, the evidence suggests that the balance requires to be tilted towards general practice, which will otherwise degenerate instead of improving Much would be gained immediately if the Government could allow an appreciably larger capitation fee on condition that the maximum permitted number of patients is also appreciably lowered. By such a move, more young recruits might be found, and more places to employ them. The distribution of doctors might more quickly even itself, and fewer under-doctored areas remain—for areas where all the doctors have lists approaching 4000 remain under-doctored. The financial sacrifices now being asked of many who are not in a position to secure big lists would be reduced. But what matters most of all is that, as soon as may be feasible, practitioners everywhere should be in a position to do their work properly, without perpetual hurry, and that the nation should have the benefit, in fact as in theory, of a genuine family-doctor service.

International Health or World Health?

A MONTH's work by the first World Health Assembly is briefly recorded by Dr. N. M. GOODMAN on another page. Much of this work was useful and promising, but the outstanding achievement of the meeting was its proof that, even in the present state of tension, international political groupings do not retain their structure when health is under consideration. Political detachment may well be expected among clinicians or scientists, but to find it in a body of official government representatives discussing administrative problems is a hopeful sign for the future of the World Health Organisation. Anyone reading through the unidentified remarks of delegates, at least in the assembly's committees, would be hard put to discover their countries of origin, and he would have even greater difficulty in defining any general "group" policies.

This held broadly true even on the major issues of programme and budget. As we remarked at its opening,[1] the assembly had a choice between what may be called international health and world health—it could rest content with doing small things which can only be done internationally, or it could attempt to achieve a measurable improvement in the health of the world—and this choice had to be faced in the debates on the budget. The Interim Commission had proposed to the assembly a budget of 6,324,700 U.S. dollars, which already represented a compromise between the older school and the "up-and-at 'ems." The British delegation—understandably perhaps, in view of our economic situation and our conservative traditions—proposed a 4 million dollar budget. In this it received general support from the United States, for internal political reasons, in spite of the United States having been the original proponents in the Interim Commission of the "W.H.O. abolishes malaria" theory; and also from the Russians, for reasons not entirely clear, but apparently from a general dislike of "swollen bureaucracies." Only the smaller nations—and by no means those with most to gain—headed by Dr. KARL EVANG, of Norway, wished to keep to the original figure of the Interim Commission. There were many protests when the favourite subjects of the delegates or their governments had to be cut out of the programme or drastically reduced, and nearly all delegates supported, from various motives, immediate regionalisation, which still further reduced the funds that can be devoted to field work. The result was a budget of 5 million dollars—more than ample for an international health programme in the pre-war sense, yet obviously inadequate for an attack on the major diseases of the world. Indeed, on a crude population basis, the sum available for such an attack works out at less than one dollar per 1000 inhabitants of the globe. Nevertheless, this may prove to be the solution, at least for the first year of the organisation's life, since experiments on aid to governments on a limited scale may not only provide experience for the future but may achieve some useful results on catalytic lines.

There remains the problem of allocating even these comparatively small sums between the various claimants. It proved hard enough for the Interim Commission to decide between the 14 UNRRA-aided countries with a fairly well-defined programme. The assembly passed this responsibility on to the executive board, without laying down any guiding principles. How will it be possible in the future to decide between a war-damaged library in the Ukraine, three fellowships requested by the Philippines, or a B.C.G. team for, say, Liberia? This is probably the most awkward problem before the new organisation, but a solution should not be beyond the capacity of the executive board and the new director-general, Dr. BROCK CHISHOLM, to whom we extend our congratulations and good wishes in his difficult task.

A New Hope in Domestic Heating

"To have the air inside a dwelling as fresh as the air outside, it is not necessary to have it as cold."—FLORENCE NIGHTINGALE.

THE urgent need for fuel economy has given a new impetus to the campaign for smoke abatement and a new encouragement to those who demand efficient domestic heating. The Department of Scientific and Industrial Research has now established at Greenwich an active station for fuel research, which has as its principal aim the economical use of fuel in the home. Before the late war, coal in Great Britain was relatively cheap and easily obtainable. In twelve or thirteen million homes it was used for heating, washing, and cooking to the extent of 60 million tons a year—of a third of the total consumption for all purposes. Of the vast amount of heat liberated, only a fifth was usefully employed and the remaining four-fifths was wasted. Because of this our houses in general have been badly heated. In the winter it is usual to find only a small area round the fire in one room kept at a comfortable temperature, the rest of the house being bitterly cold. Even the heated room does not give a full measure of comfort, owing to the draught from the excessive quantities of cold air drawn in from outside to pass up the chimney. Furthermore, our domestic chimneys have been responsible for about half of the pollution of the atmosphere by smoke. It has been estimated that smoke emitted from coal burnt in open grates before the war carried more than a million tons of tar and soot into the air every year. During recent years industry has developed domestic heating appliances which are at least twice as efficient as the older ones and can now be obtained in increasing numbers. This means that we can have more comfortable and healthier homes and can save fuel at the same time—and a saving of 5% in the fuel used for domestic consumption means an extra $2^1/_2$–3 million tons of coal a year for the export drive. It means also a saving for the consumer's pocket, for in the past the amount spent on fuel by the average householder over a period of 40 years was often equal to the capital cost of the house.

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[1] *Lancet*, July 3, p. 17.

Since its inception, the Fuel Research Station has been busily testing the new appliances before their release for installation in the post-war housing programme. To link up with these "laboratory" tests, the parent Department of Scientific and Industrial Research arranged a series of practical "living" experiments whereby many different types of heating appliances were installed in houses newly erected for occupation. The tenants themselves (sometimes, but not always, specially selected for the purpose), with the assistance of scientific observers, have been collecting observations on these "designs for living," on the physiological reactions of householders to the various appliances, and on the fuel consumption of each. The third stage in this enterprising research programme was the construction at the Fuel Research Station of a calorimeter building, lately declared open by Sir EDWARD APPLETON, F.R.S., secretary of the department. This building is not a research laboratory in the ordinary sense. It is really a scientific instrument for the measurement of heat. No-one has yet accounted completely for all the heat in the fuel burned in a domestic grate. The heat is very difficult to trace. It may be transmitted by radiation, by conduction, or by convection; it may reach the rooms in the house, but much undoubtedly is lost. The calorimeter building is designed to measure precisely all the useful heat and all the losses. The whole building is a piece of experimental apparatus of such a size that every experiment can be carried out with a full-size heating appliance. The broad principle underlying its use is that adopted by the physicist in his laboratory when he measures the heat from half a thimbleful of coal with a calorimeter. In the new building each room is a calorimeter, and there are four of them, each 12 feet square and 9 feet high—about the size of an ordinary living-room in a small house. The rooms are of air-tight construction with specially balanced draught arrangements to eliminate leakage and enable the amount of incoming air to be recorded. The total useful heat from the appliance can thereby be determined by direct measurement. It is also possible to measure separately radiant heat, warmed air from convection jackets, and heat to the boiler water. In this way an appliance may be tested without its performance being affected by the measuring instruments. The tests will give a complete picture of the behaviour of the appliance under different operating conditions, and with different fuels. The building also includes rooms for measuring by photo-electric methods the amount of smoke produced by each appliance under test.

"Mental anxiety may perhaps be considered the most powerful enemy to the duration of human life, and next to it defective nutriment, whether in quantity or quality, but after these no other cause at least in modern times, appears to have inflicted so great an amount of evil upon the human race as defective ventilation." The epidemics of catarrhal infections which plague us every winter are evidence that these words, written by Dr D. B. REID in 1844, are still true The Department of Scientific and Industrial Research is making a determined attempt to overcome the outstanding difficulties as they apply to the home.

Annotations

OCCLUSIVE DRESSINGS

THE search for a protective dressing that will effectively exclude liquids and micro-organisms, and will not at the same time damage the healing tissues, has recently met with some success. If maceration of the underlying tissues is to be prevented there should be evaporation through the dressing. Epithelium is particularly liable to maceration, as anyone knows who has wrapped his finger in a waterproof dressing to exclude air and water from a small cut or abrasion: the disappointing consequence—a white, sodden area extending round an imperfectly healed lesion—is one of common experience. Burnt surfaces tend to become macerated under all the usual dressings, and often this results in the destruction of the growing edges of epithelium, and of the islets of regenerating epithelium on which rapid healing depends. When the horny layer at the edges of a wound is sodden by insensible perspiration and sweat-gland secretions the danger of infection is enhanced.

A new technique in the treatment of burns has lately been described, at a meeting of the American Association for the Surgery of Trauma, by W. A. Brown, A. W. Farmer, and W. R. Franke, who have developed it at the Hospital for Sick Children, Toronto, and at the Royal Canadian Air Force institute of aviation medicine. The dressing they advocate is aluminium foil, which, they point out, is non-toxic and easily sterilised. They use this foil in sheets 0 001 in. thick, and apply it directly to the burnt surface, with a superimposed pressure dressing. The pressure is essential, since without it the wound may still become soggy. The foil is not impervious: the thin sheets have minute pores which allow of "perspiration" of the wound. With adequate pressure "weeping" of the wounds ceases very quickly. Second-degree burns examined ten days after application of the foil were found to be pink, dry, and healing by epithelisation without maceration. The dressings were odourless, and the foil had retained its sheen on both surfaces. In a series of 50 cases treated with aluminium-foil dressings there was one in which 35% of the body surface was burnt to the third degree; on removal of the foil the burns were found to be covered by a grey slough. Severe systemic reactions were encountered in only 12 of the 50 cases, and urinary output was generally unimpaired. Intramuscular penicillin was given sometimes, but not as a routine.

During the war, in the search for a method of waterproofing clothing for the tropics, it was noted that material which is highly resistant to liquid water may yet be permeable to water vapour; and last week we published an account[1] of experiments with nylon derivative in the form of a film which has these virtues together with the toughness and pliability that make it suitable for a wound dressing. Clinical trial has shown that the dressing is practical and that wounds treated with it heal well.

EXTROPHY OF THE BLADDER

CONGENITAL malformations are a rousing challenge to surgeons because of the lifelong burden they impose and because of the child's lively powers of recovery and adaptation after operation. Few congenital defects cause more grievous mental and physical suffering than extroversion, or extrophy, of the bladder, and no surgeon can remain satisfied with the results of treatment so far attained. In a paper read before the British Association of Urological Surgeons on June 26, Dr. Louis Michon, of Paris, described his attempts to restore urinary continence in these patients. The usual treatment—diversion of the urine—is not a cure and is a approaching 4000 remain under-doctored. The financial sacrifices now being asked of many who are not in a position to secure big lists would be reduced. But what matters most of all is that, as soon as may be feasible, practitioners everywhere should be in a position to do their work properly, without perpetual hurry, and that the nation should have the benefit, in fact as in theory, of a genuine family-doctor service.

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[1] Bull, J. P., Squire, J. R., Topley, E. *Lancet*, Aug. 7, p. 213.

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species of amœbæ living in the gut of man and of animals is extremely difficult, and it is often uncertain and insecure. Perhaps a given specimen really is *E. histolytica*; perhaps it just looks like it. For another thing, man himself is an important reservoir for the organism, and 10–20% of the ordinary adult population of England carry amœbæ which are *E. histolytica* or which cannot be distinguished from it. Yet, owing to some mysterious factor which is still unknown, very few of these carriers show evidence of dysentery, even on sigmoidoscopic examination. Rats cause great economic loss by their destruction of foodstuffs and other goods. They are potential carriers of several dangerous infections. If they also carry dysentery this does little to add to the sum of their iniquities. They ought to be destroyed, and to a large extent in this country the rat population has been destroyed, or reduced to small proportions. In the light of Neal's work, places which contain many persons infected with amœbic dysentery—e.g., Ministry of Pensions hospitals—should pay special attention to the destruction or exclusion of rats.

BETTER USE OF BEDS

THE fear that an elderly patient may block for a long time a bed which could be used over the same period for a considerable number of acute cases has sometimes led hospitals to refuse admittance to acutely ill old people.[1] This danger has been in the minds of the British Medical Association committee on the care and treatment of the elderly and infirm; and in the first supplement[2] to their 1947 report they urge the importance of getting the right patient into the right bed. The report recommended that an integrated geriatric service should be set up, based on departments in selected general hospitals. The committee have again considered the plight of the acute hospitals in meeting the demand for beds staffed with skilled nurses. If the measures recommended in the report were adopted, they believe that the bed shortage would be eased in two ways. First, sick old people would be investigated fully in the geriatric department and would therefore spare beds in the acute wards. Secondly, if enough long-stay annexes are provided for the really incurable cases, and if homes and hostels are provided for old people no longer fit to look after themselves but not requiring continuous skilled nursing, many old people now occupying beds in acute hospitals could be transferred to the appropriate surroundings. A telling example illustrates present difficulties: 8 old men not in need of active treatment have continuously occupied beds for two years which could otherwise have been used for some 360 acute surgical cases.

The committee now make some further suggestions. Short-stay hostels, they think, might be set up close to hospitals, where old people—and indeed patients of all ages—might stay for a few days while diagnostic tests were done. These hostels could be staffed by orderlies and attendants working under the minimum of skilled nursing supervision. In addition like Dr. Thomson and Dr. Curran (p. 241), they suggest convalescent hospitals—as distinct from convalescent or holiday homes—should be provided where patients might be taken by ambulance when not acutely ill but nevertheless in need of some bed-rest and nursing care. Patients with uncomplicated postoperative conditions, for example, could complete their recoveries in such hospitals, which could be staffed with a much lower proportion of trained nurses than acute hospitals. When it comes to deciding who should doctor these patients, the committee cautiously propose a compromise: the specialist staff of the hospital should "retain their responsibility" in such cases until the conclusion of the treatment, but they might with advantage, they think, have the coöperation of a local general practitioner, who would be appointed as medical officer to the convalescent hospital. This would take a little working out, for an unforeseen complication might occasionally arise while the M.O. was out on his rounds. Better facilities for outpatient care of old people would also, the committee believe, relieve pressure on beds. In a general hospital, the geriatric outpatient clinic, under a physician, would have the specialist resources of the other departments—and especially the physiotherapy department—to hand, and could provide the services of a dentist and a chiropodist; while the hospital dietitian and the almoner could both give the old people appropriate help. Patients should be brought to the outpatient clinic by transport arranged by the hospital; and adapted shooting-brakes, running a shuttle service, do very well for this purpose.

One regional hospital board has already set up an advisory committee on geriatrics, and the committee commends the idea to others. They also repeat their proposal that standing liaison committees should be established to coördinate the work of the different bodies concerned with the care of old people—that of the regional boards and the local authorities, for example. Finally they remind local authorities that they can do much to prevent old people reaching hospital by providing adequate home help and nursing services.

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[1] See *Lancet*, 1947, ii, 212.

[2] *Brit. med. J.* Aug. 7, Suppl. p. 71.

PHAGE-TYPING

IN bacteriology, species and types of organisms can often be identified by specific antibody reactions, and in this way we have learnt much about the epidemiology of some of the infectious diseases. Sometimes the serological sieve is useless because all strains fall into a few main groups, and for organisms like the typhoid bacillus bacteriophage-typing has been used instead. This method depends on the discovery by Craigie and his co-workers of an anti-Vi bacteriophage which developed specificity for the particular strain of *S. typhi* on which it was propagated. Using a series of phages adapted in this way it is possible to type a large proportion of strains freshly isolated from infected people.

Success in this field naturally led workers to try phage-typing with other organisms, such as *Staphylococcus aureus*, where ordinary serological methods gave indifferent results. Fisk[1] described a cross-culture technique of isolating staphylococcal phages, and the method was developed and given practical application by Wilson and Atkinson[2] in this country. Staphylococcal phages are not prepared in the same way as those for *S. typhi*, but a considerable degree of strain specificity has been obtained. At least a third of the population has resident staphylococci in the vestibule of the nose or on the skin, and this makes it peculiarly difficult to trace the source of staphylococcal infection. With the 22 bacteriophage filtrates of Wilson and Atkinson, routes of infection can be traced in outbreaks of food-poisoning and in some of the hospital infections caused by staphylococci. A good deal of information has already been gathered about breast abscess, pemphigus neonatorum, and sticky-eye, which are still much too common in maternity practice. Accurate identification of strains has also helped to show how these infections can be prevented, but we still do not know whether boils or other skin infections are caused by the patient's resident strain nor how staphylococci spread within families or larger groups. Methods of identifying enterotoxic strains are unsatisfactory and phage-typing might well help us here. It has been suggested that penicillin-resistant strains of staphylococci are becoming more common, but again we do not know if this is a general phenomenon or if it occurs mainly among inbred hospital strains.

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[1] Fisk, R. T. *J. infect. Dis.* 1942, 71, 153.

[2] Wilson, G. S., Atkinson, J. D. *Lancet*, 1945, i, 647.

confession of failure, for the lack of a functioning bladder and urethra has a serious emotional effect on adolescents and particularly on boys. For many years, therefore, Michon has been trying reconstructive operations, and in spite of disappointments his results have been encouraging.

The first problem is to refashion the bladder, and this can usually be done successfully; but the patient is then virtually no better off, since he is still incontinent, and the far more difficult task of contriving a new sphincter has to be faced. The ingenious method of transplanting a loop of the gracilis muscle may be successful, but one of Michon's cases showed clearly that the new sphincter did not depend on muscular action but on the ring of scar tissue around the urethra. The same effect can be produced more simply by the ribbon catgut method, but these cases suffer from the disadvantage of having no bulbocavernosus to pad the ring. An important point is to suture very carefully the muscle forming the neck of the bladder. By these methods gratifying results may be obtained, with normal micturition and clear urine. Michon described one such case, first operated on 20 years ago when the patient was a boy of five, who won distinction on active service in the late war. But even in hopeful cases reconstructive surgery may fail, and often it should not be attempted, particularly in the very young and in those with great hypoplasia of the bladder.

Diversion of the urine, though not ideal, is a sound alternative to reconstructive operations and has some advantages over them. With improved technique and modern chemotherapy the operative mortality is much reduced and the risk of subsequent infective complications lessened. It can be done at a much earlier age (soon after the end of the first year) and thus saves the mothers much trouble and distress. It can be used irrespective of the degree of hypoplasia of the bladder and is thus applicable to a much higher proportion of cases than reconstruction is. Finally, it allows the bladder to be excised and thus removes a possible source of malignant disease; as Graham pointed out in the discussion of Michon's paper, the exposed bladder mucosa soon undergoes metaplasia with the formation of cystitis glandularis, and there is a high incidence of adenocarcinoma later. Although covering the exposed mucosa by an early reconstructive operation may reverse these changes this cannot be taken for granted. None of these considerations must be neglected in the search for the ideal treatment of extrophy of the bladder.

EMPLOYMENT OF WOMEN

> "The country is faced with the task of maintaining, and if possible increasing, the female labour-force at a time when the number of women of working age is declining. The difficulty is enhanced by the even greater decline in the number of women under forty-five years of age, from whom the bulk of the female labour force is drawn."

REVIEWING this dilemma P.E.P. suggest[1] that the Ministry of Labour should forecast the probable trend in the number of women available for work in the various regions and industries during the coming fifteen years or so, and should make the findings widely known. Systematic studies are also needed to decide what jobs are done better by women than by men, and whether they are now done by women. It is clear, they say, that any substantial increase in the number of women in employment must come from married women, and that if there is not to be a considerable fall in the women's labour force, there must be a big rise in the number of middle-aged and elderly women employed. The important thing is to relax the present pressure on mothers with young children to take jobs.

P.E.P. believe that by far the most hopeful meth of gaining these ends is to extend the opportuniti for part-time work. This offers housewives some mon and wider interests, without the strain which a full-tim job imposes on a woman who must also run a hous It means there must be more careful planning and organising by employers, but there is evidence tha part-time workers give good service, and that their output is often better than that of full-time workers; nor do they compare badly in absenteeism and labou turnover. "The Ministry of Labour and employers of all kinds, including schools and hospitals," P.E.P. insist, "as well as business firms, must realise that unle they make a real effort to extend part-time work, industrial production and the social services will suffer." This has a special significance for hospitals, wher part-time nursing and the employment of married wome could and should be greatly developed.

RATS AND AMŒBÆ

THE association of rats with human disease is wel known, the most notorious example being plague, when first the rats die, and then the men die as the causativ organism *Pasturella pestis* is conveyed by fleas from th stricken rodents to the humans. Typhus is anothe familiar example. During the campaign in Burma th much-dreaded scrub typhus was due to *Rickettsi orientalis*, which is naturally a pathogen of rats, spreadin to man only as a secondary event. Rats form the reservoir for *Leptospira icterohæmorrhagiæ* and other organisms. Recently attention has been drawn to the possibility that rats may also spread amœbic dysentery. During the last thirty years occasional reports from many parts of the world have described rats containing amœbæ which resemble *Entamœba histolytica*. The first report[1] referred to wild rats at Charleston, U.S.A., in 1915. Afterwards Brug[2] described *E. histolytica* in tw rats in the Dutch East Indies. Later workers[3,4] hav recorded the presence in rats of amœbæ indistinguishabl from *E. histolytica* in Moscow and in Iraq. The lates report comes from London.

During a survey of the incidence of amœbæ parasiti in rats, Neal[5] found that 7 out of 11 rats collected at on particular place contained amœbæ with the characte istics of *E. histolytica*. Although the infection differe from human dysentery in that most of the forms were i the trophozoite phase and cysts were extremely scanty the morphological features were those of the huma pathogen. The organism could be cultivated in vitro b standard methods. When it was inoculated into the cæcu of young rats, typical ulcers were produced in many o the animals. These infections could be prevented b emetine. The house where the infected rats were caugh was inhabited by Cypriots, five of whom had arrived fro Cyprus during the previous six months. Seven of thes people were examined for protozoa and two were foun to be passing abundant cysts of *E. histolytica* in thei fæces. An investigation of the circumstances in whic the infected rats were discovered showed that there wa no trap between the sewers and the drainage system o the house in question. Owing to this defect the rat could gain access to the house from the sewerage. Twelv wild rats from other sources were all free from th infection.

The evidence thus suggests that rats can act as reservoir of infection for human amœbic dysentery, bu caution should be observed in concluding that this ofte happens or that rats are important in spreading thi disease. For one thing the identification of some of th

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1. *Planning*, July 23, 1948, no. 285. From Political and Economic Planning, 16, Queen Anne's Gate, London S.W.1.

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1. Lynch, K. M. *J. Amer. med. Ass.* 1915, 65, 2232.
2. Brug, S. L. *Geneesk. Tijdschr. Ned.-Ind.* 1919, 59, 1.
3. Epstein, G. W., Awakian, A. *Trans. R. Soc. trop. Med. Hy* 1937, 31, 87.
4. Senekji, H. A. *Ibid.* 1940, 33, 655.
5. Neal, R. A. *J. Hyg., Camb.* 1948, 46, 90.

Special Articles

FIRST WORLD HEALTH ASSEMBLY

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Now that the World Health Assembly has concluded its first annual session on July 24 after five weeks of labour, a factual summary of its work can be made.

DECISIONS OF THE ASSEMBLY

Officers and Committees.—Dr. A. Stampar (Yugoslavia), chairman of the Interim Commission, was unanimously elected president of the assembly. Dr. G. H. de Paula Souza (Brazil), Sir Aly Tewfik Shousha, Pasha (Egypt), and Rajkumari Amrit Kaur (India) were elected vice-presidents. In addition to the general or steering and credentials committees the assembly established committees on programme (Dr. K. Evang, Norway, chairman); relations (Dr. Melville Mackenzie, U.K.); headquarters and regionalisation (Dr. J. Zozaya, Mexico); administration and finance (Dr. M. Kacprzak, Poland); and legal questions (Dr. C. Van den Berg, Netherlands).

Work of the Interim Commission.—The first days were occupied with a general discussion of the report of the Interim Commission on its activities since its establishment in July, 1946. In spite of some criticisms the report was unanimously adopted and the commission congratulated on its work. It was decided that the Interim Commission should formally be dissolved on Sept. 1.

Admission of New Members.—Nine countries were admitted as new members during the assembly, bringing the total membership to 54, with several others expected in the near future. A total of 66 nations were represented at the assembly either by delegates or observers, two members—Afghanistan and Transjordan—not sending a delegation. In spite of certain reservations made by Congress to the U.S.A. ratification, notably in a claim to withdraw at one year's notice, the assembly unanimously decided to disregard the reservations and admit the United States to full membership.

Election of the Executive Board and the Director-General.—After several adjournments the assembly accepted by a substantial majority the list of 18 countries designating a member of the executive board.[1] Lots were then drawn for the two groups of six countries retiring in one and two years' time respectively, but eligible for re-election: both the U.K. and the U.S.A. fell into the first group. The executive board unanimously nominated Dr. Brock Chisholm, executive secretary of the Interim Commission, for election as director-general of the World Health Organisation, and this was confirmed by the assembly.

Headquarters.—The Economic and Social Council of the United Nations, now in session at Geneva, approved the assembly's choice of Geneva as its permanent headquarters.

WORK OF COMMITTEES

The *Programme Committee* spent a long time working through the list of subjects which might be taken up by W.H.O. and then deciding on priorities. To the *four* major activities proposed by the Interim Commission—malaria, tuberculosis, venereal diseases, and maternal and child health—were added environmental hygiene and nutrition. In the second group were placed public-health administration, hospitals, medical care and rehabilitation, medical social work, nursing, health education, industrial hygiene, and the hygiene of seafarers—the last two jointly with the International Labour Office. After this, in order, came parasitic diseases, virus diseases, mental health, and alcoholism, and finally a mixed group including cancer, leprosy, and rheumatoid diseases. The methods by which the programmes in these subjects will be implemented range from demonstration teams and other considerable field services, through expert committees, to the part time of a single specialist; but budgetary considerations may prevent anything at all being done at present in fields with a low priority. Expert committees on eight subjects were later authorised by the executive board to be set up at once, initially as nuclear groups.

The *Committee on Relations* had the difficult task of establishing formal relations with a number of bodies with whom the Interim Commission necessarily could only make working arrangements. These include the United Nations itself, the Food and Agriculture Organisation, UNESCO, I.L.O., and the International Children's Emergency Fund. Various joint committees, both organisational and expert, were authorised. Thus all medical programmes of ICEF will in future pass through a joint committee of W.H.O. and ICEF: since these projects amount to a larger budget than that of W.H.O., the importance of this committee is obvious. Coöperation with UNESCO will include, inter alia, a share in the bureau for coördination of scientific congresses. A general resolution insisted upon full preliminary consultations and joint surveys before W.H.O. undertook joint projects in the future. The integration of the Pan-American Sanitary Bureau with W.H.O. was taken a step further with authorisation to the executive board to conclude a definite agreement with a working arrangement in the meanwhile. Finally, principles for coöperation with non-governmental organisations were adopted, and criteria for their recognition: the executive board later accepted seven well-known organisations for formal recognition.

As previously noted,[1] the *Committee on Regionalisation* divided the world into six areas. Each area will form a regional committee of W.H.O. with a regional office, when a majority of the members in the area so decide. For the Americas, the P.A.S.B. when integrated will serve as the regional office. The bureau at Alexandria will act for the Eastern Mediterranean area, and Europe will have a special temporary office for "the liquidation of war damage" in the field of health. The remaining areas are the Western Pacific, South-East Asia, and Africa.

The *Administration and Finance Committee* decided at an early session to aim at a 5 million dollar budget for 1949, and then had the difficult and distasteful task of fitting the programme into a budget, planned by the Interim Commission for $6^1/_2$ million, which even then did not include funds for regional offices. Since the statutory and administrative items could not be substantially cut, the services to governments suffered most heavily. The adjustment was eventually made largely by provision for lapses—i.e., by assuming that a high proportion of posts would not be filled until late in 1949. In addition this committee dealt with a mass of matters such as the scale of contributions—the United Nations' scale was adopted, the United States dissenting—the budget for the remainder of 1948, staff regulations, allowances for members of the executive board, and appointment of external auditors. Much of the detailed work was necessarily handed on to the executive board for action.

The *Legal Committee* held a number of meetings on important questions such as the rights of associate members and the rules of procedure of the assembly and of expert committees.

Finally it was agreed that next year's assembly should meet in Europe, the executive board to decide on the place of meeting in the light of invitations received.

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[1] See *Lancet*, July 24, p. 153.

These are a few of the problems which phage-typing can help to solve.

Staphylococcus aureus is one of the most ubiquitous of potential pathogens, and coagulase-positive strains can readily be isolated from many domestic animals. There is little information about the relation of animal strains to human disease. Macdonald[3] has shown that bovine mastitis in Norfolk is caused by a single phage-type of staphylococcus, in contrast to the multiplicity of types found in human disease. This has been confirmed for other areas by Smith,[4] and it may prove of interest in the study of the ecology and perhaps also in the evolutionary history of the staphylococci. Smith has also shown that the single bovine phage-type can be subdivided by using additional phages. This was made possible by the acquired phage-resistance of some of the strains. He points out that apparent differences in phage-type may sometimes be caused by such acquired phage-resistance. The different phage-types are quite stable in the laboratory, but Smith reminds us that staphylococci, like most living things, may also become infected with other phages, or with viruses. Phage-typing is essentially a means of experimental infection, and whether the test animal be guineapig or staphylococcus its past experience may influence its present behaviour.

SIXTY YEARS OF MEDICAL DEFENCE

IN the early 1880's two Dulwich doctors, though successful in defending themselves against a charge of manslaughter and a claim for damages, found themselves out of pocket by over £1000. Soon afterwards a Chesterfield practitioner, accused of an attempted assault upon a woman patient, actually served eight months in prison before vigorous professional protests secured him a free pardon. Sir William Jenner initiated funds in the one case to make good the loss and in the other to re-establish the victim of a tragic ordeal. These experiences showed the need of some organisation for mutual help, and in 1885 the Medical Defence Union was born. All will join in congratulating it upon the successful record of *Sixty Years of Medical Defence* written by its present secretary, Dr. Robert Forbes.

The M.D.U. began modestly with 400 members and an annual subscription of 10*s*. Its present membership is over 31,000 and its reserve funds exceed £175,000. Practitioners, we learn, have besought its aid in small things as well as great—the too insistent crowing of a neighbour's cock or the tracing of a drunken locum tenens who had run off with the cash in hand and the keys of the surgery. One member complained that he was being hypnotised; another wanted help in controlling his wife. The major activities within its proper province ranged from prosecutions for the false assumption of medical titles (as when a commercial "Botanic Company" was found to be selling the titles of M.D., B.C.) to detective work in tracking down cases of impersonation. New difficulties merely stimulated progress. Just as the union was arranging to increase its members' indemnity to £3000, there came the staggering award of £25,000 against two doctors, in Harnett *v.* Bond and Adam, for wrongful detention under the Lunacy Acts. The union boldly decided to give thenceforward unlimited financial protection against damages and costs incurred in defensive or offensive litigation, provided that the member accepted the council's decision and advice. How sound that advice could be we can judge from the fact that, out of the 448 libel and slander cases undertaken in the years from 1896 to 1905, only 3 were lost. Unquestionably the continuity of expert legal guidance, happily associated with two generations of the firm of Hempson, played a great part in these successes. In 1934 the enactment of the Law Reform (Miscellaneous Provis Act brought another enlargement of scope. The made it possible to maintain an action for perso negligence against the estate of a deceased practition In one well-known case, where the defendant doc died in the course of the hearing and his widow remain liable, a verdict of £5000 was awarded for a failure diagnose tuberculosis. Hitherto the membership of t M.D.U. had been personal and benefits had ceased with death; new provision was needed for this new liability. It is not perhaps surprising that the membership, which had nearly doubled itself between 1919 and 193 continued to increase. The Harnett case had brought a record new entry. A little earlier, in Claydon *v.* Wood-Hill, £750 damages had been given against a defendant practitioner for negligent treatment of a fractured femur, and his financial loss amounted in all to some £225 The profession was shocked to learn that he was not a member of any defence society and naturally the need of universal protection was canvassed afresh. The council of the British Medical Association passed a resolution and its organisation committee invited representatives of the two defence societies to a conference, but, after negotiations which Dr. Forbes describes, it was appreciated that individual medical defence was not likely to be better or more cheaply conducted than by the existing bodies.

Amalgamation of the two has, of course, been suggested. Soon after its formation in 1893, the London and Counties Medical Protection Society (now the Medical Protection Society) approached its older rival with a proposal. A few years later, in 1899, it tried again. Our columns of that date contained a recommendation for a single strong organisation; we had hinted a criticism of the apparent reluctance of the M.D.U. as illogical and non-coöperative. Ideas of centralised medical defence, periodically ventilated at meetings of the B.M.A., presupposed the pooling of the experience and resources of the existing bodies. The two societies, working on parallel lines not only for individual protection but also for professional standards and harmonising their activities and their objects through their standing joint committee established in 1894, continue their separate wo Meanwhile the costs and risks of litigation are risin The other day a judge candidly increased an award damages on the ground of the diminished purchasing value of money.

Close on fifty years ago THE LANCET vigorously advocated membership of a defence society, and that advice is just as necessary today. Both the Medical Defence Union and the Medical Protection Society are doing invaluable work for the profession.

TUBERCULOSIS IN SCOTLAND

NEWS of an increasing incidence of tuberculosis in Scotland, on which we commented in a leading article on July 24, has been followed by the appointment of a committee to examine the position. Established by the Scottish Health Services Council at the instigation of the Secretary of the State, the committee includes three members of the council: Captain J. P. Younger (chairman), Dr. Matthew Fyfe, and Dr. J. R. Langmuir. The other members are: Prof. Charles Cameron, Prof. F. A. E. Crew, F.R.S., Dr. H. C. Elder, Dr. Stuart Laidlaw, and Dr. A. B. Maclean.

DR. T. CRAWFORD has been appointed to the university chair of pathology at St. George's Hospital medical school. Since 1946 he has been director of pathological services at the school.

DR. D. V. DAVIES, lecturer in anatomy in the University of Cambridge and fellow of St. John's College, has been appointed to the chair of anatomy at St. Thomas's Hospital medical school.

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[3] Macdonald, A. *Mon. Bull. Min. Hlth E.P.H.L.S.* 1946, 5, 230.
[4] Smith, H. W. *J. Hyg., Camb.* 1948, 46, 74.

TABLE II—ANALYSIS OF MOVEMENT OF 2937 STATE-REGISTERED NURSES AFTER THREE-YEAR AND FOUR-YEAR TRAINING

	Three-year	Four-year
Total trained	1533	1404
	%	%
Gave up nursing	14·3	16·9
Went abroad	3·6	3·1
Entered the Services	0·5	1·3
Entered non-hospital employment ..	9·0	7·2
Became pupil midwives	29·4	44·5
Took other training courses	5·0	1·8
Entered first employment in hospital ..	38·2	25·2
	100·0	100·0

hospitals are in the latter group, the total number of nurses training in each group are not very different: the three-year training gave an output of 1533, compared with an output of 1404 for the four-year training. Table II shows the results.

The larger number entering hospital employment after the three-year training is probably due to the fact that nurses who have had the shorter training are more likely to feel the need of another year's experience as staff nurse. Other variations may be due to economic factors. Most of the teaching hospitals are in the four-year group, and possibly girls training in them are in a position to regard home claims and the like as reasons for giving up salaried work more readily than girls training in other hospitals.

VOLUNTARY AND LOCAL AUTHORITY HOSPITAL TRAINING

10. An analysis has also been made of the results in voluntary hospitals as compared with those in the L.C.C. hospitals. The 44 voluntary hospitals had an output of 2019 nurses, or an average of 46 per hospital, while the 24 L.C.C. hospitals had an output of 918 nurses, or an average of 38 per hospital. In the voluntary hospitals the output varied between 5 and 215 nurses per hospital (7 having an output of over 100), while in the L.C.C. hospitals the variations was between 16 and 89 per hospital. In table III the movements of nurses from the two types of hospital are compared.

The substantially higher proportion from L.C.C. hospitals going on to "other training courses" probably reflects mainly those who went on to fever, tuberculosis, or children's training within the Council's service, more or less as an equivalent to remaining as staff nurses in their training hospitals. If this is the case, it suggests the advisability of grouping sanatoria and other "special" blocks with general hospitals in management committee groups, since the nurses would probably transfer more readily to them for further training than they would migrate to another group. Since the L.C.C. hospitals give a three-year training, the 13·4% who gave up nursing should be set against the 14·3% who gave up after three-year training, rather than the 16·5% who gave up from all the voluntary hospitals, since most of the latter have had a four-year training.

TABLE III—ANALYSIS OF MOVEMENT OF 2937 NURSES AFTER TRAINING IN VOLUNTARY AND L.C.C. HOSPITALS

	Voluntary	L.C.C.
Total trained	2019	913
	%	%
Gave up nursing	16·5	13·4
Went abroad	2·7	4·7
Entered the Services	1·1	0·5
Entered non-hospital employment (private nursing, industry, &c.)	7·3	9·9
Became pupil midwives	38·8	32·4
Took other training courses	2·2	6·3
Entered first employment in hospital ..	31·6	32·8
	100·0	100·0

REASONS FOR GIVING UP NURSING AFTER TRAINING

11. Finally, an analysis has been made of the reasons stated for the loss to nursing of 456 newly trained nurses. Results are given in table IV.

MAIN CONCLUSIONS

The three most salient facts which emerge from the survey are:

(A). Only 32% of all those whom the London hospitals train in general nursing continue directly to practise it in hospital. This takes into account only those who complete their training and ignores all who "waste" during training.

(B). 36·3% go on from general nursing to midwifery training, but of these possibly half return to general hospital work immediately after the course.

(C). 15·5% give up the practice of nursing immediately after training.

TABLE IV—REASONS FOR GIVING UP NURSING ON COMPLETING TRAINING (456 NURSES OUT OF 2937 TRAINED)

—	—	% age of no. trained	% age of no. giving up
Gave up for:			
Marriage	295	10·04	64·7
Home reasons	43	1·46	9·4
Health reasons..	10	0·34	2·2
Died	1	0·03	0·2
Did not like nursing	3	0·10	0·7
Financial reasons	2	0·06	0·4
Returned to previous occupation:			
Civil Service	3	0·27	1·8
Art	1		
Librarian training	1		
Clerical	3		
Other occupations:			
Medicine	1	0·54	3·5
Other university courses	2		
Matron in theological college ..	1		
Convent	1		
Chiropody training	1		
Air hostess	1		
Clerical	4		
Not specified	5		
Reasons not stated	78	2·66	17·1
	456	15·50	100·0

(A.) The fact that the hospitals have to train approximately three times as many nurses as they are able to retain on their permanent staff (let alone the number they would like to retain) surely deserves as much attention as the wastage during training. These figures leave out of account the wastage during training. If we accept the Working Party's estimate of a wastage-rate of 36%, or a survival-rate of 64%, this means that only 20% (32% of 64%) of those who enter for training remain in hospital posts immediately after completing training—i.e., the hospitals must admit approximately five times as many student nurses as they can hope to retain on their trained staff.

The question arises how an adequate ratio of trained nurses to student nurses—which is a prerequisite for "student status"—is to be achieved while the hospitals have to train for ever wider fields of work outside their own sphere. Although the proportion going on to non-hospital work may seem insignificant (table I) it must be remembered that health visiting, district nursing, and most overseas posts all require the first part of the midwifery training and therefore draw from the group who have gone on to that course. One answer would

LOSS OF TRAINED NURSING STAFF FROM HOSPITALS

REPORT ON A SURVEY MADE BY THE NURSING RECRUITMENT SERVICE, KING EDWARD'S HOSPITAL FUND FOR LONDON

1. THE King's Fund, in common with other interested bodies, was invited to submit to the Minister of Health comments on the report of the Working Party on the recruitment and training of nurses. In the Fund's comments reference was made to the serious and increasing loss of trained staff from hospitals shortly after completing training. Figures were quoted in support of this statement, but it was admitted that insufficient information had been collected to give a representative sample.

2. In order to collect such information, a questionary was sent out in February, 1948, to all voluntary hospitals and London County Council hospitals in the Fund's area which were complete training schools for nurses. In tribute to the ready cooperation of the hospitals it should be noted that all the 24 L.C.C. hospitals which were complete training schools returned the questionary, and 46 *out of the* 48 *voluntary hospitals*. Two returned questionaries have been discarded as incomplete. The report which follows is thus based on information supplied by 68 hospitals (44 voluntary and 24 L.C.C.), and relates to the movement of nurses immediately after completing training, and to the period between June, 1946, when "controls" were removed from nurses, and February, 1948.

3. It is at once evident that the figures would vary considerably if a count were taken a year later, or even less. Some who gave up nursing for home reasons might have been able to return, for instance; many more who stayed on in hospital might have left after a few months, while some who left for midwifery training would have returned or taken a post in another hospital. It seemed, however, that it would be asking too much of the hospitals to trace the movements of their graduates over a year or longer, and even then no finality would be reached since the movement may be two-way at any time, and the results could not be shown simply as a descending graph.

NURSES LEAVING THE PROFESSION

4. The returns relate to 2937 nurses who completed training during the period under survey. The actual total completing training was slightly larger, but those whose movements after training were not known to the hospital have been *omitted—probably most of them left* the hospital service. Of the 2937, 456 gave up nursing altogether—a wastage-rate of 15·5%. An analysis of the reasons stated for giving up nursing has been made and is shown later. Some who had been entered by the matrons on the questionary as "*gave up on marriage* but took up part-time work in hospital" have not been counted as giving up, but have been added to the total of those who entered first employment in hospital. This wastage-rate of 15·5% at the end of training needs to be set against the wastage-rate of 5·3% during the third year of training which may be calculated from the Working Party's tables.[1] It seems clear that many defer their departure from the profession in order to obtain their full qualification, and that if a two-year training were given, this high wastage-rate after qualifying would be put back to the end of the second year. It is impossible to believe that a two-year training would attract sufficient additional recruits to compensate for the loss of the service of so many third-year nurses.

NURSES LEAVING THEIR HOSPITALS

5. Of the 2481 not giving up nursing, 1076 (36·6% of the total trained) went on to midwifery training, and 102 (3·5%) to other trainings. It is mainly the la exodus to midwifery training which foils all attemp to decide what *proportion of those* the hospitals t they can count on for their own staff. According to figures supplied by the Central Midwives' Board, 56% of those who take part I of the midwifery traini go on to part II, which qualifies them to practise midwives; but in fact only 40% of these remain in midwifery. Thus of the 1002 taking part I in midwifery, approximately 241 would enter the midwifery service, leaving 761 to take up district nursing, health-visiting, school nursing, industrial nursing, to go abroad, and so on, as well as to remain in hospital service. In view of the *fact that* part I midwifery training is needed for nearly all the above-mentioned non-hospital branches, it *may be* assumed *that* a large number of those taking part I are going on to them. It is very unlikely, therefore, that of the 761 more than 500 return to hospital work, and the *numbers may be much* less. *It must be* pointed out that whereas the other figures given in this report are actual data collected from the hospita the figures in the foregoing sentence and in the last sentence of para. 7 are estimates only, based on the data collected.

6. Of the remaining 1303 who continued to nurse but did not take further training, 98 went abroad, 26 joined the nursing services of the Crown, and 239 took up nursing away from hospitals. The questionary not ask that the forms of non-hospital nursing should be specified, *but it is surprising to find that* a number of matrons have made special mention of private nursing under this heading. The remaining 940, or 32%, took up first employment in their own or some other hospital.

TABLE I—ANALYSIS OF MOVEMENT OF 2937 STATE-REGISTERED NURSES ON COMPLETING GENERAL TRAINING

	%
Gave up nursing	15·5
Went abroad..	3·4
Entered the Services	0·9
Entered non-hospital employment (private nursing, industry, &c.)	8·1
Became pupil midwives	36·6
Took other training courses..	3·5
Entered first employment in hospital (other than training)	32·0*
	100

* This includes a few part-time nurses.

7. *It will* be remembered *that* the Working Party states that since approximately 9300 nurses qualify for the various State registers and the Royal Medico-psychological Association certificate annually in Great Britain, it could be assumed that nearly 10,000 nurses entered first employment in all hospitals each year. If we added to our 940 remaining in hospital *the maximum* of 500 ex-pupil-midwives mentioned in para. 5, we would have a total of 49% returning to the hospitals or 4557 out of the 9300 qualifying, rather than "nearly 10,000."

8. Percentage findings based on the answers to the questionary are shown in table I.

THREE-YEAR AND FOUR-YEAR TRAINING

9. The returns have also been analysed to see what difference, if any, there is in the results after a three-year and after a four-year training. Forty-seven of the hospitals give a three-year training, and twenty-one a four-year training. As, however, most of the largest

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[1] Report of the Working Party, p. 90, table D, and p. 29, para. 82.

These show the life lived by two little boys whose father is warden on a Rhodesian game reserve. The animal pictures are exceptionally good. and the films give a fair idea of life in this out-of-the-way place, the fruits the children eat. the games they play, and the dangers they run. The principle of letting audiences see how the other child lives is borne out by *Our Club Magazine*, a series showing cinema club members at play in various parts of Britain.

The clubs form local committees made up of representatives of the local education authority, and of organisations interested in the welfare of children. as well as a youth-club leader. and elected members of children forming the club. These children, and the club stewards. are able to tell the committee. and the managers of the cinemas, how various types of film have been received and criticised. The usual price of admission is 6*d*.—a non-profit-making charge. Any surplus goes towards encouraging club activities outside the cinema, and any loss is made good by the Rank organisation. Outside activities evidently form an important part of the club's work in some localities, outings and competitions being arranged: a fishing competition, a visit to a lifeboat, a steamer trip up the Tyne were among the occasions reported in the club magazine.

It is clear that these clubs are making a useful contribution to youth movements and it is therefore all the more important that a large and reliable pool of films should be made available. that the cutting of unsuitable material is not overlooked. and that all cinemas giving children's matinees should conform to the standards maintained in the best type of club.

The question of serials also needs considering. The children like these exciting episodes greatly, but it is hard to ensure that the excitement is of a kind to be borne easily by the nervous child, and free of other undesirable qualities; and there are not enough of the right kind in hand. Nowadays the serial goes in the middle of the programme, not at the end; so that at least the children leave the theatre on a satisfying final note. and not in that suspended day-dream which (in the time of the *Perils of Pauline*) often took your correspondent almost under a bus.

CANADIAN MEDICAL ASSOCIATION

THE 79th annual meeting of the Canadian Medical Association, held in Toronto from June 21 to 25, was attended by 2024 members—a record number, amounting to one in six of doctors in Canada. The guests included Sir William Fletcher Shaw, who spoke on the Scientific Outlook and also gave an address to the graduating class at Toronto University; Prof. Brian Maegraith, dean of the Liverpool School of Tropical Medicine, whose subject was the Physiological Approach to Medical Problems; Dr. Frank Walsh, of Baltimore, who addressed a general session on Myasthenia Gravis; Dr. C. O. Sappington, of Chicago, an outstanding figure in the comparatively new field of industrial medicine; and Dr. P. S. Hench, from the Mayo Clinic, whose topic was arthritis.

A number of affiliated societies met during the convention and the round-table discussions in several departments occupied the mornings. The Lister lecture was attended by some 400 people, who heard Dr. W. E. Gallie, emeritus professor of surgery in the University of Toronto, set forth the ideals for the training of surgeons, in an address entitled the Practice of Surgery in Canada.

In a colourful ceremony Dr. F. G. McGuinness, of Winnipeg, president of the association, installed Dr. William Magner, of Toronto, as his successor. Dr. Magner, a graduate of Cork, came to Toronto as a pathologist in 1922 and was appointed an assistant professor in the university department of pathology.

The Canadian Physicians' Fine Art and Camera Salon proved a great attraction. As a hobby, art seems to appeal to an increasing number of Canadian physicians.

The planning of the convention was perfect with one exception—only 2200 programmes had been printed, and the supply ran out.

NATIONAL HEALTH SERVICE AND THE PUBLIC

B.M.A. STATEMENT

THE following statement has been issued by the British Medical Association in connexion with recent allegations in the House of Commons.[1]

When Miss Alice Bacon, M.P., made her statement in the House of Commons accusing some doctors of improper practices, the association at once informed her that if she would provide details it would make prompt inquiries. Miss Bacon, however, declined the invitation, saying that her proper course as an M.P. was to lay the matter before the Minister. None the less, the association, as representing nine out of ten of all doctors, is obviously concerned to see that a situation which is new to more than half the population in the country, and to many doctors, is clarified. Accordingly an examination has been made of the reports reaching the association and of the misconceptions which are chiefly prevalent.

The National Health Service has on the whole started smoothly in most districts of the country. None the less difficulties are being met with—as is natural and indeed inevitable with such a vast and far-reaching piece of social legislation. These difficulties should neither be exaggerated nor glossed over. It would be unfair to put the blame on doctors for misunderstandings which are not of their making. It would be still more unfair to charge the entire medical profession with incorrect behaviour which actually involves a very small minority indeed.

Some of the alleged "abuses" charged against individual doctors are clearly not abuses at all in any ethical, still less in any legal sense. Others spring from a simple misunderstanding either by the doctor or by the public. The following points, however, deserve emphasis:

1. The basis of family medical practice is free choice. The country wants free choice, and free choice works both ways. No doctor should be forced to become the doctor of any particular patient, just as no person should be forced to become the patient of any particular doctor. The family doctor has the right to refuse to accept any individual as a patient. Nor need he give any reasons for his refusal, just as no patient need give reasons for choosing, or leaving, a particular doctor.
2. The National Health Service is open to everyone in the country irrespective of income. The association is confident that the profession in general would strongly deprecate the refusal by any doctor to accept an individual as a National Health Service patient on financial grounds. Obviously the decision to be a public or a private patient must be a matter for the individual patient. Incidentally there are two misapprehensions that are fairly general. First, that everyone in the country is required to be on a doctor's list of public patients; secondly, that since July 5 private practice is no longer permitted. Both beliefs are, of course, incorrect. Registration with a doctor is a voluntary act. Private practice by doctors who have joined the National Health Service is fully protected by the law.
3. Every doctor has the right to set a limit to the number of patients he is prepared to accept on his National Health Service list. He has the right, that is, to set a limit to the numbers that his own circumstances permit him to attend as public patients. It must be remembered that within the service all receive equal treatment according to their medical needs. It is impossible for the doctor—or indeed for the Government or the administration—to give any public patient advantages or privileges not enjoyed by the others. It must never be overlooked that there is a grave shortage of doctors and facilities.
4. The profession will feel strongly, the association is confident, that although a doctor is fully entitled to decline to undertake work for which he has no special aptitude, it would be entirely wrong for him to discriminate against particular classes—e.g., to refuse to accept as patients children or old people on the ground that they involve too much work. This is regarded as contrary to the standards of medical practice.

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[1] *Lancet*, July 24, p. 163.

seem to be that if the public-health services need increased numbers, efforts should be made to recruit and provide training as "health teachers" for the many intelligent girls interested in "social work" or "community service" who have no wish or vocation to take a full training in the nursing of the sick. These could be complementary to the health visitors who are qualified nurses.

(B.) The fact that more than a third of all those who complete training go on to the midwifery course invites the question whether it may be too readily assumed in some hospitals that this is obviously the next step, even for those who intend to remain in hospital posts. A staff nurse in a general ward does not need to have had midwifery training, nor do the sisters in male and some female wards. A nurse who has taken midwifery training after general may not be willing to return to a staff nurse's post, whereas a year or two at least in that capacity might have fitted her much better for a ward sister's post, or indeed for many other posts of responsibility. The way would still be open for her to take midwifery training later if she wished to do so. It might be well for hospitals to put this point of view before student nurses during their training—experience at the Nursing Recruitment Centre shows that many of them apply as early as their second year for places in midwifery training schools. It might also be well to ask the midwifery training schools, which have long waiting-lists and a surplus of candidates to give precedence, to those candidates who have had some hospital experience after training, rather than to book student nurses for vacancies a year or two ahead.

(C.) The proportion giving up nursing altogether is high; but it must be noted that the majority leave to marry—a reason to which exception cannot be taken. It does suggest, however, that much more effort should be made to retain the services of those married nurses who wish to work outside their homes. At present they are allowed to drift into other employment—as receptionists, clerks, &c.—where their nursing training is not put to full use.

Nor can serious exception be taken, in present circumstances, to the number giving up for home reasons, though possibly some of them might be retained for hospital service if non-resident posts with "office hours," in outpatient or other departments, could be had at their local hospitals.

Probably most of the 78 whose reasons for giving up are not known drift into other occupations offering less responsible work and requiring less effort. This would raise the "other occupations" group to about 20%. It is known, for instance, that many young nurses seek secretarial or receptionist posts: indeed, one hospital which sought to economise the time of its nursing staff by appointing outpatient clerks or receptionists found that a number of nurses applied for these posts. It is well worth considering whether this shrinking from responsibility or full endeavour may be due to the almost universal lack of preparation for ward sisters' posts and the example of those who have been appointed to them unprepared, with resultant strain and waste of effort. There must be some deterrent factor at work to cause so many nurses who have just achieved their professional qualification to turn away from the very work for which they have been training. If they could be given a long holiday, and could know that if they return to a staff nurse's post they would be able after a year or two to take a short course in preparation for ward sisters' duties, many might be encouraged to remain in hospital, where their services are needed so urgently. Courses of this kind, available throughout the country without payment of fees, might well become an important factor in building up the permanent staff in hospitals.

CHILDREN'S CINEMA CLUBS

(FROM A CORRESPONDENT)

ON Saturday mornings thousands of children go the cinema. They are glad to go, and their mot are presumably glad to know they are enjoying themsel somewhere out of harm's way—and out of ever else's way too. This would hardly justify the however, if the children were given only trivial or p debased entertainment which did them more harm good. The work of the Children's Ent Film (C.E.F.) section of Gaumont-British Instruct Ltd., is therefore important.

This group, set up in 1944, is responsible for pr children's films, primarily for the Odeon and Gaumo British Junior Cinema Clubs, but also for other childre film clubs and for private showing. The Odeon Gaumont-British clubs—of which there are 400 in G Britain—were launched by J. Arthur Rank in 1 and they have a membership of 400,000 children the ages of seven and fourteen. But there are some other cinemas in the country, many of which Saturday matinees for children, and the standard these varies with the interest of the managers, high in some, low in others.

C.E.F. are guided by an advisory council on which representatives of the Minister of Education, the Ho Secretary, and the Secretary of State for Scotland, of national bodies interested in children's leis Members of this council visit different parts of the country and discuss, with teachers and youth leade the production of special films for children. The fil are initiated by C.E.F. and made under their supervisio by various independent companies.

There is thus good machinery at work to ensure that the children belonging to the junior cinema clubs see suitable films; but as yet the pool of films is small, and programmes sometimes have to be eked out by material which is not quite appropriate. An account of a recent programme in a country town in the Hom Counties serves to illustrate this, and also to show how the clubs are run.

A CLUB IN ACTION

Each junior club has its children's committee, elected by the children themselves, and representing different ag groups. The members of this committee act as steward and are responsible for the orderly behaviour of the c *members as they enter and leave the cinema.* The stew wear armlets denoting their office, and on the occa mentioned were successful in maintaining very good or The clubs work in association with the Royal Society for Prevention of Accidents, and as the children were coming music was playing and the screen showed safety-first mott and advice on the crossing of roads.

The programme opened with some community singing by the assistant manager of the theatre, and this was follow by a film of Sandy Macpherson at the organ also lead community singing. This film, intended for adults, was really successful since the songs were somewhat inappropri *Arrangements had been made to cut one sentimental song,* it appeared none the less; and this seems to be a difficul distributors, it seems, are often careless about making outs ordered.

The "club promise" followed. Standing, and in uni the children promised to follow various social lines of cond —to be kind to animals, and helpful to old people, to o their parents, and to try to make this a better country to in; and if the last seemed a heavy, and the penultimate impossible, undertaking the children at least were untrou by doubts: they promised with gusto.

Next came two cartoons—one a very good *Donald D* The other, a not very successful piece of anti-war propagan was on trial, and was judged unsuitable for general show An episode in a serial specially (and well) made for childr a splendid nature film about otters, and a very good feat *The Little Ballerina*, completed a programme in which standard of taste was on the whole very high, and instructi *agreeably camouflaged. Deathlike silence during the* showin broken by laughter and gasps in the right places, showed th the entertainment value was high too.

Among films lately produced for C.E.F. are a series five by General Film Distributors called *Pen Pictu from Rhodesia.*

creamery could not have been accepted as drinking-water for a village or a town. The finding of fæcal *Bact. coli* in one of the samples of water taken in the washing machines showed that *S. paratyphi* B could have passed into the bottles.

With such a system for the treatment of water as was used in this creamery any failure, for however short a period, would produce the gravest of risks, since a few drops of contaminated water containing paratyphoid bacilli could be left in the bottles. Consideration of the capacity of the storage tank and the hourly consumption of water shows that, though on the average the period of contact with chlorine was over an hour, this period must have been liable to great variations, since water was constantly running in and out of the tank. There would be periods of very special risk when the pumps were started up after an idle period and the storage tank was empty.

It was not until late in the year that the possibility that the paratyphoid fever was milk-borne was entertained. Since the 55 cases were notified in twelve different local-authority areas, it did not at first appear clear that a milk-supply was the probable source of infection of all of them. When the cases in the whole area were reviewed, however, it became evident that some definite inquiry into the possibility that the pasteurised milk consumed by the patients had a common source was called for.

That the epidemic was not much more serious was indeed fortunate, when it is considered that 200,000 persons regularly consumed milk from this creamery, including the pupils of 230 schools.

The incidence of paratyphoid fever in the two counties in the previous six years was studied, since the pasteurisation plant had opened in 1939. It was found that in the summer of 1941 there was an epidemic of paratyphoid fever with exactly the same distribution as that in 1946. There were 76 cases notified in 1941, including 15 recorded as "enteric" without further details. Of the 76 patients 49 lived in the three valleys where most of the cases occurred in 1946. The ratios of the numbers of cases appearing in the three valleys to the total number of cases in the two counties during successive years were as follows: 1940, 7 out of 30; 1941, 49 out of 76; 1942, out of 12; 1943, 7 out of 11; 1944, 1 out of 3; 1945, out of 12; and 1946, 41 out of 55. A retrospective examination was made of the records of the cases occurring in 1941 in the local-authority area where the creamery was situated. There were 13 cases (12 were notified in one month), and 8 of the patients received milk from the creamery, whereas 5 did not. It was impossible to trace the ultimate source of the milk-supply of the 5 patients who gave no history of drinking the suspected milk, as was done in 1946, but 3 of these patients were boys who bathed in the river which flowed by the creamery.

We wish to thank many medical officers of health and officials at the creamery who provided us with every facility to inquire into the outbreak; Dr. M. T. Parker, of the Public Health Laboratory Service, for providing us with the details of cases in his county; and Dr. A. Félix, F.R.S., for typing all the strains of paratyphoid bacilli.

London's Water-supplies

IN their report[1] the Departmental Committee on Greater London Water Supplies recommend urgent inquiry into resources and prospective demands throughout the area. At the same time, says the report, plans should be prepared for a new major source of supply, which will be needed in the not very distant future.

The committee agree that the resources of the area must be treated as a whole, and that the community of interest in the area and the geological unity of the Thames basin demand the pooling of all resources and the treating of water problems in coördination. They also agree that a central water authority is necessary, and that the cost of the new major source of supply should be borne by the whole area. But the committee are unable to agree on the method of administration, two members favouring a simple "all-purpose" authority for the whole area, while the other three consider that there should be four joint boards, with a central water authority to coördinate the use of the internal resources of the area and to develop the new major source.

In the Metropolitan Water Board's area, during the year ended March 31, 1947, the average daily consumption per head for all purposes, including industry and public uses, was 51·8 gallons; for the surrounding area the comparable figure was 39 gallons. This consumption, it is felt, will certainly rise, largely owing to: (1) the higher standard of water services in modern houses; (2) increased demands by industry and for the new towns; (3) district heating; and (4) the extension of water-supplies in rural parts. The committee estimate that allowance should be made for an eventual daily consumption per head of 60 gallons in the Metropolitan Water Board's area and 50 gallons in the outer area. It is suggested that by 1960 Greater London's total requirements will be of the order of 670 million gallons a day. Even after completion of new reservoirs at Wraysbury and Datchet, in a drought year similar to that of 1944 there would be a deficiency of at least 10 million gallons per day.

Utilisation of Vitamin Supplements

In a recent number of the *Medical Officer*,[1] Dr. Joseph Berkeley draws attention to wastage of Government vitamin foods. Investigation at infant-welfare centres showed that in the Kendal district about half of the orange juice and a third of the cod-liver oil is not consumed after purchase; and of 87 mothers with infants aged between 2 months and 12 months, 44 (50·6%) had discontinued the giving of orange juice, and 28 (32·2%) had discontinued cod-liver oil. The reasons given by the mothers related mainly to the child's intolerance of these foods. Dr. Berkeley concludes that the true proportion of infants who suffer digestive disturbances from this cause is less than the mother's answers would suggest; but nevertheless, he adds, consideration should be given to replacing the present preparations by others more palatable and better suited to infants' digestive capacities.

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[1] Report of the Departmental Committee on Greater London Water Supplies. H.M. Stationery Office. 3*s.* 6*d*.

1. July 3, p. 5.

Notification of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended July				
	3	10	17	24	31
Cerebrospinal fever	42	24	25	25	40
Diphtheria	141	150	183	139	125
Dysentery	69	56	67	108	77
Encephalitis lethargica ..	1	..	1	..	2
Measles, excluding rubella ..	8987	8837	9459	8501	8211
Ophthalmia neonatorum ..	57	37	55	54	54
Paratyphoid fever	6	6	12	9	35*
Pneumonia, primary or influenzal	350	340	377	385	355
Polioencephalitis	2	2	2	6	1
Poliomyelitis	36	23	36	39	38
Puerperal pyrexia	120	84	96	121	122
Scarlet fever	1532	1658	1703	1747	1329
Smallpox	..	..	..	..	..
Typhoid fever	6	5	4	13	9
Whooping-cough	2907	3075	3416	3359	3309

* Corby (Northants) and Eastbourne each had 10 cases.

Public Health

ENTERIC FEVER (PARATYPHOID B) APPARENTLY SPREAD BY PASTEURISED MILK

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IN a county with a population of about 1,000,000 there were 48 proved cases of paratyphoid fever in 1946.

In the north of the county are several densely populated valleys, and 28 of the patients lived in one valley; 7 came from the neighbouring valley to the east; and 6 from the valley to the west. The remaining 7 cases were scattered throughout the northern and western districts of the county. Of the 48 patients 30 were females, 31 were under 18 years of age, and 22 were under 10 years; 3 were accepted as secondary cases. All the cases were notified in the latter half of the year, but most occurred in August (21 cases) or in the first half of November (12 cases), and it was not until the second wave appeared that a connecting link between the cases which occurred over a wide area was discovered.

At this time a review of the information relating to the cases in nine different local-authority areas showed that many of the patients consumed pasteurised milk, the original source of which was not always stated. Further investigation showed that all the pasteurised milk concerned was traceable to one creamery. There were still, however, some children who did not consume pasteurised milk at home. Investigation showed that they received the suspected pasteurised milk at school. All except 3 of the 48 cases gave a clear history of regularly drinking the milk from the same creamery, which was situated in the valley where most of the cases occurred, and the distribution of the cases followed closely the distribution of the milk.

Further evidence in support of the theory that the infection was spread from this creamery was obtained from a neighbouring county, where 7 cases of paratyphoid fever were notified in the latter half of 1946, in all of which the patients had partaken at home or at school of the suspected milk. The cases appeared in three local-authority areas with a total population of 83,000, yet only 500 gallons, a small fraction of the total milk consumed in the area, was received from the suspected source.

INVESTIGATION OF THE CREAMERY

The creamery pasteurised daily 15,000 gallons of milk, and inspection of the plant and records showed no evidence that the heat treatment had been inadequate. The main source of water from the creamery was a nearby river, from which 3000 gallons was drawn hourly. Chlorine, to produce a concentration of 2·5 parts per million, was injected by an automatic pulsator into the crude water, which was then passed through a Candy pressure filter to an elevated storage tank of 5000-gallon capacity. From the tank this water passed to the bottle-washing machines, where, after the initial cleansing with hot detergents, it was used for the final rinsing immediately before the bottles were filled with pasteurised milk. The bottles were rinsed both inside and outside as they passed inverted on a conveyer system. Samples of this water had often been taken from the jets of the bottle-washing machines for examination in the creamery's laboratory, and readings of 0·3–1 part of residual chlo per million were usual, but occasionally much lo readings were obtained. Bacteriological examinati had been made periodically, and presumptive colif bacilli often found. When difficulty was experien in maintaining a supply of chlorinated water ei because chlorine was not available or because of a bre down in the pump house, a supply was obtained f the local mains, but this too was led to the storage t already mentioned. Such a temporary change in wa supply was common, being made on nine occasion 1946.

The river water was heavily contaminated with sewage of several towns higher up the valley, and a san of water collected near the intake to the crear yielded more than 18,000 presumptive coliform ba per 100 ml., more than 1800 fæcal *Bact. coli* per 100 and *S. paratyphi* B of the same bacteriophage typ that responsible for all the cases (phage type 1). Sam of river water taken over several weeks yielded *S. p typhi* B on three out of four occasions.

The constancy with which paratyphoid-B organi could be isolated from the river near the intake to creamery was surprising, because the river had a c siderable flow, estimated roughly at 2,000,000–3,000, gallons an hour. On investigation of the sewage charging into the river higher up, however, a sm examination of each of three outflows from separ towns yielded *S. paratyphi* B type 1 six months a the last case of paratyphoid fever had been notified.

Several samples of the chlorinated water were ta by us from the jets of the bottle-washing machines, a from one of these fæcal *Bact. coli* was isolated (1 100 ml.). Tests for presumptive coliform bacilli w often positive, but this result was due to clostridia, probably the presumptive coliform bacilli found pre ously in samples examined in the creamery's laborat were mostly clostridia. The presence of only a presumptive coliform bacilli (1 to 4 per 100 ml.) had b accepted in the past as evidence of the efficiency of plant and of the purity of the water. Tests for fa *Bact. coli* had not previously been made.

Examination of the workers in the creamery did reveal any carrier of *S. paratyphi* B.

After the use of the river water had been discontin only 4 cases of paratyphoid fever were notified in county in the next year. One of these was found t excreting *S. paratyphi* B phage type 1 from a drai gall-bladder after a surgical operation. There was evidence that this patient had recently acquired infection, and she may have been an old carrier. of the remaining three cases were in nurses who atten this patient. The last case was a girl who gave no hist of having had milk from the creamery.

DISCUSSION

Milk-borne diseases are not always readily recogni In some cases an explosive outbreak affecting yo persons may reveal the source of the infection imm ately, but many outbreaks producing a few cases spr over a considerable time often pass unnoticed.

So far as we can ascertain, this is the first record o outbreak of paratyphoid fever in this country spread pasteurised milk, and the experience shows the imp ance of making a careful check on all the processes pasteurisation plant and not merely on the ac heating of the milk. In this outbreak the milk was infected in the processing chambers, but appare only occasional bottles were contaminated by the w from the jets of the washing machines. It was cle possible for such a method of infection of the m supply to account for only 55 cases in six months. W used to rinse bottles before they are filled with should be a potable water, and the water used in

Letters to the Editor

THE TWO PATTERNS

SIR,—The Spens report on the remuneration of specialists speaks of

> "The intention underlying the National Health Service Act that in the hospital system of the future there should be a more uniform level of hospital efficiency throughout the country, a better distribution of specialists, and permeation throughout the hospital service of each region of the influence of the university centre. These objects can be achieved only by increasing the mobility of specialists throughout the service and facilitating the interchange of staffs between teaching and non-teaching hospitals . . . it is obviously important that the status of the area hospital centre should be in no way inferior to that of the teaching hospital, and that both should be able to attract specialists of the highest calibre. We are therefore of opinion that the same range of remuneration for clinical work should apply to specialists in both teaching and non-teaching hospitals."

The question immediately arises, will this be enough by itself to bring about equality of status between area hospital and teaching hospital? Does anyone believe that a mere levelling of income will bring this about? If anything will it not make the competition to remain at a teaching hospital even more intense than it has been? The best men have seldom cared mainly about money; their work and the conditions affecting this are what have mattered most to them. They have in the past accepted low pay, financial insecurity, and no guarantee of eventually getting on to the staff, for the privilege of working at a teaching hospital with its atmosphere and opportunities.

Clearly some more radical change is needed if the area hospitals are ever to achieve "equality of status" with the teaching hospitals. More circulation of staff—and this will be far more difficult to secure in practice than on paper—will not be enough. Can one readily imagine a specialist on the staff of a teaching hospital being willing to transfer to an area hospital as these have been organised? Surely if we are ever to see the interchange of staff between area and teaching hospital, and real equality of status between them, they must have roughly the same kind of organisation and internal administration, ensuring to their staffs the same conditions of work and a similar share of responsibility for the welfare of their hospitals.

We are fortunate in this country in that for many years an experiment has been going on in which two very different types of internal hospital administration have been used—i.e., that of the teaching and voluntary hospitals and that of the county and municipal hospitals. In the former the medical staff committee had considerable power and responsibility, especially in the teaching hospital, and worked through a hospital administrator—usually lay—who was the servant and executive officer of the committee and of the corporation; in the latter the administration was in the hands of a medical superintendent, and if a staff committee existed its function was purely advisory.

The standard of hospital practice with the exception of the care of the chronic sick and of the aged—in which the municipal hospitals have a unique experience—has been set by the teaching hospital. Clearly these have succeeded not only in attracting the best men but in providing them with conditions for fruitful work. Why has this been so and what are the secrets of their success? As you pointed out in your leading article of July 17, staff selection is a question of "truly fundamental importance." But in addition to exercising great care in the selection of staff (and this was almost entirely in the hands of the medical staff itself) there were other practices common to them all—i.e., complete clinical freedom, the presence of students, the prosecution of research, and the assistance of a powerful medical committee which in fact ran the hospital and school and was the custodian of its traditions.

Has not the time come to examine the organisation, methods of internal administration, and practice of the teaching and of the municipal hospital, to decide in the light of experience which methods give the best results, and to adopt these as far as possible for all large general hospitals? Would not this be the most practical way of ensuring real equality of status, and incidentally would it not reduce the need for interchange of staff between area and teaching hospital, while in fact making such interchange easier? The traditions and esprit-de-corps of the teaching hospitals have been a tremendous factor in their success. We must foster the growth of these essential imponderables in the area hospitals if the intention of the Act is to be translated into reality. What better or more tested method of doing this than by giving the staff of these hospitals a real and important share of responsibility for their welfare and development?

Richmond, Surrey. E. A. DEVENISH.

PAIN

SIR,—In spite of my giving a definition of psychogenic pain, when using the term in my paper on pain charts, misunderstanding seems to have arisen. I have not tried the pain-chart technique on psychoneurotics—only on normal persons. These may experience psychogenic pain. The "irregular" nature of such pain is in response to stimuli and analgesic drugs—not merely arrhythmic as Dr. Lowy interprets it in your issue of July 10.

Dr. Barton Hall (July 17) suspects me of psychological philistinism; but he fails to notice my definition of psychogenic pain, and consequently proceeds to tilt at windmills with quixotic fervour. Let me repeat: I am not describing psychoneurotic patients. Every physician and psychiatrist must be aware of patients with true anxiety, experiencing pain as a symptom; cases were plentiful during the war. Such persons are amenable to suggestion and reassurance early, but can be turned into psychoneurotics by mismanagement, especially if of unstable personality. Such a situation may be produced by organic disease, and must be assessed. It is here that the pain-chart technique gives information which is useful in management of the case, as described in my paper. Let me assure Dr. Barton Hall that the psychological aspect of the case described was considered; the brief résumé submitted was designed as a background to the pain chart, not as a full and irrelevant clinical and psychological case-history.

Pain charts of the type illustrated are commonly found in persons with pain "which has little or no organic basis, and is maximally influenced by suggestion"—i.e., of "psychogenic" as opposed to "organic" origin. In the context of assessing the response to analgesic drugs this fact is of prime importance. I have emphasised that in many patients with cancer or coronary-artery disease there is response to distilled water (see chart 7), and that in the management of cases the assessment of this factor is of considerable value. Such assessment is of course, made in conjunction with the rest of the clinical picture. I see no reason at all for the perpetuation of the abuse of the distilled-water test "as a diagnostic refuge" for housemen as suggested by Dr. Barton Hall. However, I am concerned to prevent doctors tricking, not only their patients, but themselves in the use of analgesic drugs.

Dr. Pinoff (July 24) discusses the interesting factor of pain sensitivity. I have given much attention to this, but have obtained no evidence of rapid oscillations in normal persons. Chart 4 in the paper is a record of untreated pain, such as he asks for, in which it will be seen that a similar stimulus at different times produces similar response. However, during the experience of pain, sensitivity is decreased. Counterirritation by blistering, &c., depended on this fact for its questionable benefits. Shakespeare describes it with beautiful accuracy when he says: "One fire burns out another's burning. One pain is lessened by another's anguish."

Dr. Craig (July 31), like Dr. Barton Hall, having ignored my definition of psychogenic pain, plunges deep into the obscure depths of the "bad" word (without defining it), and emerges ascribing to me "views" on subjects that I cannot find mentioned in the paper. The pain chart records pain alone, not the underlying

In England Now

A Running Commentary by Peripatetic Correspondents

THE inhabitants of Henley-on-Thames are used to seeing magnificent young men with all shades of sunburn, clad in exotic variations on the zoot-suit (if that is how you spell the garments skiers wear). But this year's gathering of the rowing men of 27 nations for the Olympic events—the royal blue and white of Finland, the port-wine of Portugal, the red, white, and blue of Great Britain, the scarlet of Canada, the green of Ireland, and so on—has put even regatta week in the shade.

The weather has been beastly: mostly drizzle with occasional showers. Except for the last afternoon, when summer returned with a bang, and even the vast open stand (3000-odd seats at 30*s.* compared with 25*s.* in the covered stand) was crowded. On Saturday morning, when the towpath crowd were yelling like mad over the victory of Risso of Uruguay, the clouds opened, and for five minutes we cowered under whatever shelter we could find, to emerge chattering like monkeys. For Risso, an "outsider," had done the impossible. Many lengths behind John B. Kelly, jun., of the U.S.A., famous son of a distinguished Olympic sculler, he had spurted when most men would have given up hope, to win by inches. On Saturday afternoon the sun shone while we worked the family skiff on to the booms to see the British eight and double-scullers qualify for Monday's finals. But on the whole the boatmen have worn long faces and only the plutocrats in the covered stands have kept dry. The high spot, I think, was watching the starts on the first morning, when only a few foreign officials were present. With the starter calling "Messieurs! Êtes-vous prêts? Partez!" and the coxes of Portugal, Greece, Yugoslavia, Hungary, and Italy yelling as no Anglo-Saxon could do, we felt we were taking part in a truly international affair.

* * *

Two things immediately strike the visitor who has previously lived here long enough to lose his astonishment at skyscrapers, spittoons, and the New York summer. These two things are the price of food, and the connotation of the word communist.

Don't let anybody tell you that the end of price controls stopped rationing here; it merely shifted a certain number of citizens out of the rationing bracket and reduced the rations of others. Meat prices are the highest; you pay in strict proportion, it seems, to the amount of useful amino acids ingested. Prices vary, of course, across the continent and by localities, but the following are representative of the East Coast and a lower middle-class district. Steak and lamb chops are 6*s.* a lb., pork chops (in bygone days the staple food of many a Negro janitor and many a medical student) 4*s.*, and chicken 3*s.* Butter is 5*s.* a lb., eggs about 4*s.* 3*d.* a dozen, milk 6*d.* a pint, fish around 3*s.* to 3*s.* 6*d.* a lb. It took me longer to extract from the young commercial traveller, who rents the basement of the house where I am staying, information about the dietary he and his wife follow than it did for him to tell me that mine was at starvation level; but I finally discovered they had meat once or twice every fortnight. An old friend who had been at medical school with my wife, and whose husband was also a doctor, was more forthcoming. Both were relatively new in practice, and still in the mildly struggling stages—in their middle thirties, in other words. They very seldom had steaks or chops, though they managed meat meals of a more English type about three or four times a week, with chicken once or twice: the yearly food bill for three adults and three children was £500. Wages and earnings are, of course, somewhat higher than in England—in the academic medical world just about 25%. A professor of physiology gets £2000–2500, an associate professor (reader) about £1500–2000, an assistant professor (lecturer) £1000–1250. Probably, with cars, refrigerators, radios, and many household goods below English prices, food above it, and rent and entertainment not too dissimilar, the standard of living of British and American counterparts is about the same, at any rate below professorial level. The G.P. on the average lives better, I would say, since (as in England) he can generally expect to earn more than a professor. In other wo the rich (and this includes the £8 a day visiting busi man) do all right: the poor—well, they gripe like n the ones I've talked to, but more about the Russi and, in New York, the British, than about food prices those who play the food markets.

The *New York Times* has published a chart dr by the State Labor Department dealing with the tr of weekly earnings, actual and real, for 900 New York City manufacturing workers. Since beginning of 1945 the price index has gone up 30% actual wages 16%: real wages have come steadily d and are now at the level of February, 1943, a midway p in the armament boom from January, 1941, to the of March, 1945. Inflation here is a familiar word, every person I have asked expects a depression, s tacular or minor (but mostly the former) within t years, "unless," add a good 50%, "there is a war fl

Events in Berlin and the activities of the Cong investigators of men such as Dr. Condon, the em physicist, get inextricably mixed in the many peo minds. Among the majority of social and educati strata in New York City (by and large a liberal strongh it is not an exaggeration to say that anyone holdi political or economic doctrine departing from the clas conception of laisser-faire is called a communist. looks as though this country is getting set for a witch-hunt. And at the same time there is a frightening sentiment widespread amongst the peop have talked to: it is akin to that of the British in and 1939—"let's get it over with: anything is be than this business of not being allowed to live in pea

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As one who has suffered several forms of relen trauma, I cannot but admire the surgical Torquema who has just described his method of preventing scro hæmatoma following repair of hernia. He informs that "an elastic adhesive bandage, about 1½ in. w and 12 in. long, is wound in spiral fashion around scrotum from apex to base . . . after three or four da the strapping may be *released*" (italics mine).

In this connexion one recalls the apocryphal story the eminent Scottish surgeon who advised orchidecto to a business man of his city. Alarmed, the la proceeded instantly to London, whence he retur reassured, to tell Sir William that "the Harley St specialist did not confirm your suggested treatment: thought that painting the testicle with iodine m meet the case." "An excellent remedy," re Macewen, "but first have the testicle removed; it be the more easily painted."

* * *

I remember that great temperance lecturer, the R Courtenay Weeks, whose obituary appeared in THE LAN last autumn, speaking to a crowded student audi at Liverpool University many years ago. At time the Engineering Faculty was (perhaps it still an obstreperous element in undergraduate society, engineers always appeared on public occasions wea khaki boiler-suits as a kind of uniform indicating t profession. Thus attired they bombarded the un tunate Dr. Weeks with loud and ribald interruptio But Dr. Weeks was an experienced speaker who thou he knew all about the treatment and cure of heckl Pausing in the full tide of his diatribe against alco he said, "Gentlemen, many people have called m crank, but I appeal to my engineering friends here remember that a crank is an essential component many important mechanisms." Like a flash one qui witted engineer shouted back, "Only when it's w oiled!" The meeting dissolved in helpless laughter never came under control again.

* * *

Being married to an embryo psychiatrist my takes her job very seriously, so her embarrassment be imagined when, coming home unexpectedly the o afternoon, I overheard her in the garden furio shaking our two-year-old, above whose screams could distinguished, "I don't care two hoots what this does *your* complexes; all I know is that you're absolut ruining *mine*."

tact, as well as skill in shorthand, typing, bookkeeping, and filing.

Why does not the Ministry of Health set up a training-school for medical secretaries, who are after all very necessary to the efficient running of hospitals? If, after learning shorthand and typewriting, girls could receive training in elementary physiology (to give them a basic knowledge of what they are doing), simple instruction in the various branches of specialist medicine. practice in taking technical reports and keeping medical records, and even some practical training to enable them to assist in hospital departments or in a private surgery, followed by examinations and the award of diplomas, the medical secretary would then have a recognised place in the medical world; and the standard of work. particularly from stenographers taking reports. would improve accordingly.

MEDICAL SECRETARY.

PROFESSIONAL SECRECY AND VENEREAL DISEASE

SIR,—At the end of last year[1] you were good enough to allow me to draw attention to breaches of professional secrecy which doctors found themselves compelled to make by Government departments. notably the Ministry of Food. The position of doctors under the National Health Service Act is rendered still more invidious by S.I. 506 and 507 (March 24. 1948) which compel the general practitioner to submit his medical records of public patients under his care to the inspection and even to the custody of two bodies: (1) the local executive council, and (2) the (local) medical services committee, the first consisting of 50% lay members. and the second of an actual majority of lay members. including the chairman. Concurrently with these developments. and in the same unhappy direction, a breach has been made in a practice which has enjoyed statutory authority for thirty years. By the operation of the Bevan Act. the Public Health Venereal Diseases Regulations, 1916, have been revoked, and with this revocation, the statutory requirement that all information obtained about persons under treatment for V.D. shall be confidential has been withdrawn. Unhappily, the motives underlying these new arrangements would seem to be that scrutiny of records is demanded by the economic pressure to reduce to the lowest possible level the actual disbursements for benefits and services promised by the N.I. and N.H.S. Acts.

There have long been two schools of thought in this matter of dealing with venereal diseases—the school which clamours for their notification, and the school which pleads for the maintenance of absolute confidentiality. A trial of strength between these two views was staged in an important debate in the House of Commons on April 19, 1928, on a Bill presented by the Edinburgh Corporation calling for their compulsory notification. Mr. Pethick Lawrence, as he then was, proposed a motion which I seconded. resisting the demand for notification. The weight of opinion was strongly against any relaxation of the statutory requirement quoted, and the Edinburgh Bill was defeated by a large majority. I believe that since then the practice has been universal in V.D. clinics by which the patient seeking advice and treatment is given written assurance that no disclosure shall be made of his disorder. and that a number shall be substituted for his name on any records made.

I submit, Sir, that in present circumstances, when venereal disease has been classed, as in a recent broadcast, among the four diseases which are now most destructive to humanity, any suspicion of relaxation of secrecy is to be especially deprecated.

House of Commons. E. GRAHAM-LITTLE.

SIR,—For over 30 years treatment of V.D. in this country has been confidential by custom and by statute. The effect of this, together with the arrangements for free voluntary treatment and careful public education, has been excellent, as the figures of attendance at public clinics show.

The principles that treatment shall be free and that it shall be voluntary, which were secured by regulations in 1916, are included in the new scheme; but the important and necessary requirement of confidence, on which all British V.D. treatment has been built and on which all public propaganda is based, is left out. No explanation has been given, nor have any satisfactory replies to Parliamentary and other questions been received. The Minister has said that he hopes confidence will be maintained as before: and no doubt doctors, nurses, and administrators will do everything possible to observe this. as in the past. But his hopes cannot have the same power and efficacy as a legal requirement.

The amendments to the N.H.S. Act which are now being drafted will presumably rectify the omissions and ambiguities of the Act. It is to be hoped that the medical profession and all who are concerned with the treatment of patients and administration of clinics and hospitals will urge the Minister to restore the requirement that (to quote the revoked 1916 regulation) "all information obtained in regard to any person treated under a scheme approved in pursuance of this article shall be regarded as confidential."

KATHARINE B. HARDWICK

Livingstone House,
Broadway,
London, S.W.1.

General Secretary, Association
for Moral and Social
Hygiene.

HEARING-AIDS

SIR,—May we through your columns make clear the position regarding hearing-aid supplies?

We are receiving a considerable number of callers with E.C.10 prescriptions. some of which are specifying that the patient be supplied with a "National hearing-aid"; others prescribe that the patient's existing hearing-aid shall be repaired under the health scheme. and still others call for supplies of hearing-aid batteries.

The Government has chosen to leave hearing-aid manufacturers such as ourselves outside the scheme, and therefore we are not in a position to accept prescriptions for any hearing-aid supplies other than those for which the patient is prepared to make payment. It seems unfair that existing users of hearing-aids are not to get assistance towards maintaining their instruments, but it remains for the deafened public to make representation in the proper quarter if they wish to get this apparent anomaly rectified.

Oxford. JOHN BELL & CROYDEN.

REPEATING THE PRESCRIPTION

SIR,—In the National Health Service, as you say,[1] "Private patients who formerly had repeat prescriptions filled by pharmacists now come to have each prescription written on to the official form; . . ." And the extra labour involved has been mentioned among reasons for staying out of the service.[2] May I put the other side?

In the first place, the reputable practice of medicine insists that patients should not be treated without supervision. On the whole, the most reputable type of practice relies on the maximum of supervision with the minimum of medication. and the old National Health Insurance very rightly protected patients from the least reputable type, which is medication without supervision.

In the second place, the amount of drug prescribed rested with the doctor's discretion, as it does now. One could prescribe, say, 200 digoxin or phenobarbitone tablets. to last 2–3 months, if one felt that the patient would be likely to flourish on these unsupervised. Liquid preparations have an additional limiting factor in the size of the largest available bottle, but a three months' course of iron in liquid form could still be ordered on a chain of antedated prescriptions—if one were determined not to see the patient during that time. So far as I am aware. all this can be done still.

In the third place. even the private patient was, and is, protected from indiscriminate drugging, in so far as the Poisons Schedule stands between him and his (or his doctor's) folly. Now, as before, the chemist is obliged to keep prescriptions with scheduled drugs, and to obtain the doctor's permission before dispensing the same drug again. This arrangement is intended to

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1. *Lancet*, 1947, ii, 962.

1. *Lancet*, Aug. 7, p. 223.
2. *Ibid*, 1948, i, 995.

disease, in the same way as a temperature chart records body temperature only. Interpretation of such charts is a separate part of diagnosis; the chart itself is purely descriptive. However, just as a temperature chart may legitimately suggest a diagnosis of typhoid fever, so may a pain chart amplify history-taking and convey information regarding the psychogenic or organic nature of the pain.

Staines. K. D. Keele.

CARS FOR DOCTORS

Sir,—Your correspondent "Waiting-list" (July 31) wrote as follows: "To wait until the car will not go at all, and will therefore pass muster as 'unserviceable,' is obviously fantastic."

Fantastic, but fact these days. My own car, 1938 model, has given all the symptoms and signs of one or more worn big ends for the past two months. My garage, a large firm and the local agents for this make, assured me that spare parts were unobtainable, as were any reliable reconditioned engines for this model; they arranged to have the engine in August, for the parts to be made and the crank reground. However, the big end broke and the car jammed immobile ten days ago. Since then I have been unable to hire or borrow a car.

Improvident? I do not think so. In March, 1946, when my release from the R.A.M.C. was imminent, I ordered a new car. I am still awaiting delivery, and the distributors cannot even now tell me when I am likely to get it. In the circumstances I had to buy a second-hand car to start practice, and though this car served me well mechanically it meant that: (1) I had a serviceable vehicle and so lost my "really early date" for delivery; and (2) my new car will cost £1080 instead of £680—the price when I ordered it. No firm had any cars to hire before early October, and the firm offering one then quoted the price as 22 guineas per week, including petrol.

My patients are visited by taxi in the day or on foot or *bicycle at night. The expense is nothing* compared with the pitfalls of buying another second-hand car and having another "serviceable" car.

Hildenborough. C. Glaisher.

EPIDEMIC JAUNDICE

Sir,—The interesting papers[1] and your leading article[2] on the sequelæ of epidemic jaundice, prompt a note on the following case:

In the winter of 1945–46 a physician, aged 55, in civil practice had a moderately severe attack of "infective hepatitis." The infection was possibly derived from among Servicemen who attended outpatient clinics for consultation. They included soldiers from Italy and Africa and prisoners-of-war.

The onset was insidious. In November the patient had a mild rigor followed by a few days of fever. In December there was a second bout of fever associated with "fatty diarrhœa." During January he became emaciated: ascites and œdema of the feet developed, and fever continued with profuse nocturnal sweats. Jaundice appeared late (at the end of January) and was slight, affecting the face and upper limbs more than the trunk and legs: absence of bile from the stools and biliuria were of much longer duration than the jaundice. The liver became grossly enlarged, reaching below the umbilicus, with the right lobe touching the iliac crest; the spleen was never palpable. Recovery was slow, a mild pyrexia (night reading 100°F) persisting until the middle of April when observations were discontinued; the *liver gradually diminished in size and signs of obstructive* jaundice disappeared. In September he appeared perfectly well and was able to walk and swim as usual during a holiday at the Lakes.

The first relapse occurred in February, 1947, after a night journey to Scotland in an unheated train. Mild fever and signs of hepatic obstruction developed, with nausea and anorexia but no jaundice. *The liver again became enlarged* almost to its former dimensions. This attack was not so severe as the first, and by July recovery was apparently complete. There was a third relapse or recurrence in December, 1947, which began with vomiting and fatty diarrhœa. The enlarged to a lesser degree than in the first and second at and there was no jaundice. At the end of June this he was free from symptoms but the liver was still pal two finger-breadths below the costal margin.

The pathology of the liver can only be surmised the absence of liver puncture or functional tests, but remarkable variation in size is difficult to correlate *cirrhosis or partial necrosis. Is it due to the* "clo swelling" of the morbid anatomist superimposed o cirrhotic liver? The relapsing type of infective hepat is recognised, but this case differs from most of t recorded in that the original attack and each of the t relapses have been progressively less severe, w apparently complete recovery. With regard to suggestion of hepatic neurosis following hepatitis, t patient has developed a distaste for fried food and m fat; he is now sensitive to cold, and especially to c winds to which he was *formerly* indifferent.

A last point may be made concerning the treatment infective hepatitis. Rest in bed and high protein are considered essential. This patient continued work during the first attack though his activity curtailed partly by difficulty in walking or going upst. He had a fortnight's convalescence three months a the onset. In the subsequent relapses he has contin to work as usual. It is difficult however to see how t régime can have influenced the relapsing course of illness.

The Victi

MISTAKEN DIAGNOSIS OF CANCER

Sir,—As Mr. Justice Birkett's decision is disquieti to the medical profession, so are your comme last week disquieting to patients. Having stated t position definitely that "to omit to use all proper a accustomed aids to diagnosis is obviously a breach professional duty" you then try to escape *on the "no-o* can be infallible" plea. Surely a pathological report an essential for the diagnosis of a malignant growt In a cancer hospital I was assured that such a rep is routine. The difficulty had been to believe the accur of the newspaper reports that the surgeon had b guilty of such an omission; now The Lancet re confirms them.

Even with confirmation from the pathologist, h far is a surgeon justified in telling a patient that he only live a short while? It is time that our statis were reorientated on a health basis. The number people who are alive when according to medical op they *ought to be* dead would be surprising.

One of the Dead

MEDICAL RECORDS

Sir,—In reading last week's letter on this subj I was struck by the sentence: "The difficulty of find a good medical stenographer was acknowledged." reason is not far to seek.

Other workers in the field of medicine are recogni —*the nurse, the technician,* the physiotherapist, t radiographer—but not the medical secretary. There no special training for her, and there is little distinct between the secretary carrying a great deal of respo bility and the most junior typist. How would a sis enjoy being treated in the same way as a student n Most secretaries and stenographers who choose a me career do so because they consider it more "sele than commerce, because they think it will be easy, because the work is of absorbing interest to the I think the majority come into this last category, for it very badly paid, often highly responsible, and certai far from easy.

Something should certainly be done about salar Doctors are notoriously mean when it comes to pay their secretaries, but I do not think they really me to be. I think it is because all medical clerical classes *lumped together* rather contemptuously in a doct mind as "typists." A nurse's skill is respected, but secretary is not credited with having any; yet t must be well educated, possess a pleasing personali and have a high degree of intelligence, initiative, a

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1. Sherlock, S. *Lancet,* 1948, i, 817. King, W. E., Parsons, P. J., Perry, J. W., Freeman, M. *Ibid,* p. 864. Bjorneboe, M., Jersild, M., Lundbæk, K., Thaysen, E. H., Ryssing, E. *Ibid,* p. 867.
2. Leading article, *Ibid,* p. 873.

did not notify the patient; and he did not take any tests.

The M.O.H. next received a letter from solicitors, claiming damages on behalf of the discharged cook on the grounds that the letter written by him to the manageress was libellous, that as a result of it she had lost her position, that she had become unemployable in such capacity, and that after very little investigation the allegation made had been shown to be unfounded. The solicitors also made a claim against the county council.

When the case came for trial before Mr. Justice Maguire on May 3, 1948, the plaintiff gave evidence that after dismissal she returned to hospital where tests were made: the results, she was informed, were satisfactory. She had since been afraid to take up employment as a cook although she had had plenty of offers. Under cross-examination she said that two other employees on the restaurant car to which the typhoid epidemic had been traced had had typhoid.

A doctor gave evidence that the girl was originally in hospital for two months, and was discharged after the usual routine tests. On readmission tests showed that she was over the typhoid and was not excreting typhoid bacilli at the time the tests were made. Under cross-examination he said that the plaintiff could have been a precocious carrier, and that 19 or 20 persons were admitted to his hospital as a result of the Great Northern Railway outbreak. He was satisfied that the overwhelming weight of evidence showed that the infection came from the staff of the dining-car, and his opinion was that the plaintiff was the most likely member of the staff. In his opinion she might have been a precocious carrier and a convalescent carrier. He considered that it would be very risky to have kept the girl in the hotel without a check. He himself had not warned her against handling food, but it was a routine matter that she should be warned by a member of the staff.

The plaintiff, on being recalled, stated that no warning was given to her on leaving the hospital.

In his evidence the M.O.H. agreed that he had not complied with the regulations as laid down. He did not carry out an examination as there was no time to do it: he considered it his primary duty to get rid of the girl as cook. He appreciated that under the regulations his only power was to have the girl removed for a stated period, and that he had not specified any period in his letter.

The chief medical officer of the Department of Health stated that he considered unworkable the regulations in force at the time to which the complaint referred; they had been superseded by new regulations. He thought that it was not safe to allow the plaintiff to work in her position in the hotel.

The jury, having previously given a direction dismissing the county council from the action, found in favour of the plaintiff and to the effect that the M.O.H. had been negligent in the discharge of his statutory duties; and they assessed damages at £750.

The council of the Medical Protection Society, which had acted for the M.O.H., decided that an appeal was useless in view of the finding on facts, and in view of the undoubted fact that despite the medical evidence being in his favour he had exceeded his statutory powers and had by his failure to notify the patient deprived her of the right to compensation.

An Action Dismissed

Two years ago[1] a brief note in this column referred to litigation against Mr. H. G. Bedford Russell in respect of money received from a deceased patient. Sums amounting to approximately £10,000 had been paid to him over two years, and the patient's executor, in taking over her affairs, felt it his duty, in the interests of her estate, to seek to recover the money. Members of the medical profession stand in a special relation to their patients and are exposed in such circumstances to allegations of having exerted undue influence.

The litigation was happily ended on July 29, when counsel for the executor announced that subsequent enquiries had shown that the patient gave Mr. Russell the money not by way of gift but for the furtherance of research into the origins of the sinus trouble (from which she suffered) and its effects upon the mind and body. Steps had been taken to give effect to this charitable purpose by a trust deed approved by the Attorney-General. Mr. Russell's counsel stated that it was reasonable for the executor to have brought the initial action; the executor declared that Mr. Russell had acted in a perfectly proper manner and that all allegations of unprofessional conduct or undue influence were entirely unfounded and unreservedly withdrawn. Mr. Justice Vaisey, dismissing the action and making the appropriate order by consent of all the parties, said the case had served the useful purpose of clearing Mr. Russell of any kind of impropriety, professional or otherwise.

Obituary

CHARLES MATHESON KENNEDY

M.B.E., F.R.C.S.

Mr. C. M. Kennedy, surgeon to the Prince of Wales's Hospital, Plymouth, died on July 26. Although within a few months of retirement, he was still in active hospital and private practice.

Born in co. Donegal in 1884, the son of Dr. David Kennedy, he was educated at Queen's College, British Guiana, and at St. Edward's School, Oxford. At the London Hospital he was an enthusiastic member of the club's union and played rugby for the hospital. In 1906 he took the Conjoint qualification, and five years later the F.R.C.S. In 1911 he became surgical registrar at the London, and two years later he was appointed to the staff of the East London Hospital for Children. His career was interrupted by the 1914–18 war, during which he served as a surgical specialist, later commanding a hospital engaged chiefly in cerebral surgery. He rose to the rank of lieut.-colonel and was appointed M.B.E. On demobilisation he returned to his hospital appointments in London, but when an opening occurred he obtained a staff appointment at the (then) South Devon and East Cornwall Hospital and settled in Plymouth.

Here he led a full life, for besides being a general surgeon he held posts as orthopædic surgeon to the South Devon and East Cornwall Hospital, to the Plymouth City Hospital, and to the Dame Hannah Rogers Hospital for Children at Ivybridge. Though his work was thus largely orthopædic, it was never predominantly so, and his writings were on abdominal surgery. In spite of heavy work he also undertook command of the Wessex Territorial field ambulance, recruited in Plymouth, and he was at various times president of the Plymouth Medical Society and of the South Western branch of the British Medical Association. An excellent committeeman and chairman, he was for several years secretary of the medical board of his hospital.

"Charles Kennedy's surgery," writes H.F.V., "was of a high standard, and he was a leading light in the West Country, where his punctuality and his ability to recollect details of cases will long be remembered. His opinion, whether upon professional matters or hospital administration, was much sought: when one went to him to discuss some difficult problem he would ponder for a few seconds only, and then give an answer which was always well balanced and advice which was worth following. A strong character, forceful but kind, he never hesitated to denounce another's views, and he could be a strong but scrupulously just opponent. Nothing if not honest, he was always a loyal and trustworthy friend."

Mr. Kennedy leaves a widow and four sons.

HUGH COLLIN DAVIES

M.D. GLASG.

Dr. H. Collin Davies died at his home in Colwyn Bay on July 29. He was born in Carmarthen in 1878, and received his early training at the University College, Cardiff, where he held an open exhibition in natural science. After graduating at Glasgow University in 1903 he spent many years in practice in South and West Wales, and during the 1914–18 war he served in the R.A.M.C. In 1925 he took his M.D. and in the same bring doctor and patient together at suitable intervals, whenever anything in the nature of a potent or dangerous drug is in question; it applies to private and public patients alike, and it assumes that doctors are reasonably interested in their patients' welfare. If we don't dispute this, what exactly are we grumbling at? That a smaller number of people than hitherto will be able to imbibe medicines to their hearts' content and without guidance? Or that the State is at fault for refusing to pay for drugs and services the usefulness of which is to be judged entirely by the patient? It seems risky enough to leave it to the judgment of the doctor, if he regards the patient's visit as a tiresome reminder that another prescription is due, instead of as an opportunity to watch progress and change or withold drugs according to the results obtained.

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[1] *Lancet*, 1946, ii, 31

The number of conditions which need constant medication with relatively innocuous drugs are relatively few—quite certainly not enough to make prescription-writing a nuisance. Where the nuisance exists, the conditions must be absent, and it just shows how wise the State is in restricting malpractice of this kind by discouraging its perpetrators.

PRACTITIONER.

BINOCULAR MICROSCOPES

SIR,—The lessened eyestrain resulting from the use of binocular microscopes has led to their being employed very largely by those of us who have to work with them all day. Until the beginning of the century the Wenham and Greenough binoculars were the only practical instruments of this kind, but they were restricted to low powers, the former (which used one objective) because of the nature of the Wenham prism, the latter because to increase stereoscopy two objectives were used. With the introduction of efficient half-silvered prisms, it became possible to make binocular attachments for the ordinary microscope, all the ordinary powers of the microscope being now usable with them. In spite of the single objective, a considerable amount of stereoscopy is obtainable in this way, and it can even be exaggerated by suitable eyepiece-caps.

In the Wenham and Greenough binoculars converging tubes were used, largely for structural reasons, but the more modern binocular microscopes, as made on the Continent and in America, have parallel eyepieces. The reason for this is clear enough. One of the most elementary pieces of instruction to beginners with the microscope is to work with relaxed accommodation, partly because this is the most restful way to work, and partly (when a monocular instrument is used) to render the image seen by the unoccupied eye as vague and ill-defined as possible so that it may be the more easily disregarded.

Lately, however, two English manufacturers have attempted to reintroduce converging oculars in their binocular microscopes, the reason given being that, since the object is ten inches away, there is a tendency to imagine that you are looking at it direct, and that therefore you accommodate and converge your eyes. Furthermore, they say that it facilitates stopping to write notes, as you do not have to bring your eyes back from infinity. There is certainly increased difficulty in doing this after the age of 45 or thereabout, but microscopes are surely not made exclusively for workers over that age, and workers over this age may well have difficulty in accommodating to the ten inches laid down by the makers. The decision to change to converging oculars was apparently made at a conference of optical manufacturers, and one can only say that it is a pity they did not consult a competent physiologist before making the decision. For it is surely impossible simultaneously to converge your eyes and relax your accommodation without resultant eyestrain. The answer I have obtained from both manufacturers in response to inquiry has been that you do not in point of fact work with relaxed accommodation at all—an answer that seems to me at variance with the facts. All the experienced pathologists of my acquaintances work with relaxed accommodation as ascertained by careful testing. Where you are working (as with a microscope) with two focusing systems—the accommodation and the fine adjustment of the microscope—both focusing on an object at no clearly defined distance away, it is obvio best to keep one fixed and move only the other. the accommodation is powerless to do any but a fraction of the huge focusing that is necessary, it clearly the accommodation that must remain fixed, it can only do so comfortably at its limit—i.e., at relaxation.

Whatever may be the theory of the matter, practical aspect is decisive. The parallel-tube i ments are comfortable to work with all day—I done so myself for many years. But I have also of the converging type, and it only takes about f minutes' work with this to make my eyes ache and

It seems to me important to get this point settl and it would be a great help if a physiologist such Professor Hartridge would give us the benefit of opinion.

London, W.1. J. W. SHACKLE.

BAL

SIR,—

Ignoramuses like me
 Think the Editor might see
Ambiguities should be
 Made as plain as plain *can* be:
Judge today then my surprise
 That you did not put us wise
Thinking that we should surmise
 What BAL might epitomise.
As a favour, Sir, you might
 For those others in my plight
Let me that key-word indite—
 *B*ritish *A*nti-*L*ewisite.

ZETA.

*** The new approved name for BAL is dimercapro (July 31, p. 193).—ED. L.

Medicine and the Law

Dismissal of Suspected Typhoid Carrier

A CASE recently heard in the High Court at Dubl underlines the need for close adherence to regulations i securing exclusion of a suspected typhoid carrier fro work involving food-handling.

In May, 1945, a medical officer of health in received a letter from another medical officer of notifying him that a young woman believed to be at a hotel in the first M.O.H.'s area had cont typhoid in the previous July and had been empl as cook "on the Great Northern dining-car with an outbreak of typhoid was connected." On disch from hospital, the letter added, she had been cert as free from *Salmonella typhi*.

On receipt of this letter the M.O.H. visited the in question and confirmed that the woman had taken up an appointment there as cook. He expl to the manageress that it might be dangerous to e her as a food-handler. When interviewed the admitted that she had been employed in the dining- After further discussion with the manageress the M.O telephoned the hospital where her condition had b investigated and was told that investigation had poi to her as the cause of the outbreak. The M.O.H. a saw the manageress and said that he was afraid would have to stop this young woman from prepa and handling food. He did not tell her to sack the He told her that the hospital doctor had said that girl should not be employed as a food-handler, and felt that it was his duty to implement this b this doctor had said that she might be a preco carrier. He telephoned the Department of Health was told by an official that the girl should not, in opinion, be employed as a food-handler, but that decision would have to rest with the M.O.H. He wrote a letter to the manageress which included t words:

> "I am sorry to say that she is possibly a carrier of typhoid fever. She must not be employed you in any position connected with the preparation handling of food."

The manageress then dismissed the girl. The M. wrote down the patient's name in his register but

INCITEMENTS TO ACTION

Examples of the new murals at Orsett Lodge Hospital, Essex, described in THE LANCET, July 24, p. 167. The elderly and infirm patients are cheered and braced by these active scenes set in the times of their youth.

that the congress has set itself two tasks. The sections dealing with the environment, occupational hazards, and diseases of the worker will set out what the doctor's job in industry is; those on the training of industrial medical officers, on the organisation of industrial medical services, and on the integration of occupational health with national and community services will discuss how he may best get on with it. At the end of the congress proper Mr. H. E. Griffiths will give the Mackenzie industrial health lecture, at B.M.A. House, on the Surgeon in Industry. In the following week the delegates will scatter all over the country from Cumberland to South Wales, visiting research units and reablement centres, and watching our industrial health services—national and private—in action. All inquiries about the congress should be addressed to Miss G. B. Mawdesley, room 501, B.M.A. House, Tavistock Square, London, W.C.1.

PERMANENT COMMISSIONS IN THE R.A.F.

THE Royal Air Force is short of officers on the permanent staff of the medical and dental branches. Doctors and dentists who have left the R.A.F. on release and who are interested in making a career in the Service are accordingly invited to apply for permanent appointments in these branches. Applications should be addressed to the Air Ministry (M.A.1). Adastral House, Kingsway, London, W.C.2. All suitable officers now serving on short-service commissions are being considered for permanencies, and permanent commissions are being offered also to doctors and dentists who served during the war and who have now returned to civilian life.

HOME HELPS

THE London County Council has inherited the results of the work on the home-help service begun by the 28 metropolitan borough councils and the City Corporation. Mr. Reginald Stamp, chairman of the L.C.C. health committee, addressing the National Association of Home Help Organisers on July 17, said that in future the service will probably be planned for the nine London divisional areas coterminous with educational divisions. Home-help organisers will be appointed in each division, and will encourage properly qualified women to give help to the infirm or to those in need during times of sickness or other difficulty. The divisions will be split up into neighbourhood units, and just as the health visitor becomes familiar with families, so it is hoped will the organiser get to know the population intimately and prepare a setting for friendly understanding between helper and helped.

Payment of home helps is being arranged on lines which will take account not only of the need of help but of the ability of the citizen to pay. The organisers must create a public opinion which will enable the home help to do her work in the right atmosphere. She must not be made to feel subservient to the householder, and she must have the right attitude towards her service. The organisers, he suggested, should offer their home helps clubs and educational opportunities, not only to train them for their work, but to give them a broad interest in the affairs of human kind.

Miss Dorothy Elliott, chairman of the National Institute of Houseworkers, agreed that one of the chief tasks facing the institute was to build up a good domestic health service under the local authorities. This institute gives a diploma, and some of those holding it are already employed by local authorities as home helps.

A FIFTH FREEDOM

To the four freedoms of the Atlantic Charter, Ilford Borough Council have added a fifth—freedom from food and drink infection. To achieve this end they are undertaking a campaign which will include lectures and demonstrations to food-handling trades and their own provision of meals and catering services. Meanwhile a small but competent leaflet, illustrated with telling pictures, is being distributed to householders. It gives 23 items of good advice, preceded by a short homily on the principles which underlie methods of safeguarding food. Among other things, householders are advised to beware of transmitting infection from dirty hands and septic sores, to avoid touching the mouth or nose when handling food, to make sure that cooking utensils are clean, to keep the dustbin covered, to wash the hands after visiting the toilet, and to kill flies and bluebottles. Some useful advice for mothers follows, on the cleansing and sterilising of bottles and teats, and the care of the baby's food, especially broth.

LIFE WITH JUNIOR

THIS American "March of Time" film sets out to give some idea of the life and behaviour of 10-year-olds. The first part shows the routine and the adventures of a schoolboy throughout one day, with the repercussions of these adventures on the family life. The second part is devoted to problem children and the way in which the Child Study Association of America tries to deal with their difficulties.

It may be that the picture presented is typical of American middle-class patterns, but it is hardly typical of the same social strata in Great Britain. The juvenile court is reminiscent of the Brains Trust—children solving problems, with admiring parents sitting round and clapping their wisecracks. All the children, especially the girls, look rather overfed and are dressed and behave like Hollywood stars in miniature. The breaking of eggs into a hat in play, the bewildering variety and choice of delicious foods the American child refuses to eat, and the sight of the science room in the school for 10-year-olds with all its elaborate contraptions can only rouse envy in the British spectator.

year he joined the staff of the Welsh Board of Health as regional medical officer, an appointment which he held until his retirement in 1945.

During the late war Dr. Davies was seconded by the Welsh Board of Health to the Emergency Hospital Service as hospital officer for North Wales and deputy for the area. As such, he was responsible for organising the Emergency Services throughout the six counties of North Wales. "The strain of this work," a colleague writes, "which came at a time of his life when he was past his prime, must have contributed to the ill health which he suffered during his retirement. His kindly disposition, however, and his constant cheerfulness were strong enough to overcome his disabilities. His long experience as a general practitioner enabled him, when he joined the Board of Health, to carry out his official duties in an outstanding way. To doctors throughout Wales he was known as a kind friend, and cases referred to him were sure not only of sympathetic consideration but also of a first-class opinion."

Births, Marriages, and Deaths

BIRTHS

BLEAKLEY.—On Aug. 1, at Bangor, co. Down, the wife of Dr. John Bleakley—a son.

CLELAND.—On Aug. 3, at Irvine, the wife of Mr. Gavin Cleland, F.R.C.S.E.—a daughter.

COLE.—On July 30, at Dorking, the wife of Dr. William Cole—a son.

CONWAY.—On July 31, the wife of Dr. James Conway—a daughter.

COURTIN.—On July 22, at Rochester, Minnesota, the wife of Dr. R. F. Courtin—a son.

HARTLEY.—On Aug. 1, at Rye, the wife of Dr. J. L. Hartley—a daughter.

KINGDON.—On July 30, at Swanwick, the wife of Dr. John R. Kingdon—a daughter.

MORRISON.—On July 29, at Sheerness, the wife of Dr. J. N. Morrison—a daughter.

NOTT-BOWER.—On Aug. 3, at Cirencester, the wife of Squadron-Leader T. M. Nott-Bower, M.R.C.S.—a son.

PARSONS.—On Aug. 3, at Bexhill-on-Sea, the wife of Dr. A. C. D. Parsons—a daughter.

PAULLEY.—On Aug. 4, in London, the wife of Dr. J. W. Paulley—a daughter.

PRICE.—On Aug. 9, at Bath, the wife of Dr. A. E. Kingsley Price—a son.

QUINTON.—On July 30, at Ipswich, the wife of Dr. John Quinton—a daughter.

RICHARDS.—On Aug. 2, the wife of Dr. Donald Richards—a daughter.

ROBERTS.—On July 29, in London, the wife of Dr. A. T. M. Roberts—a daughter.

SHAW.—On July 31, at Braunton, the wife of Dr. F. O. J. Shaw—a daughter.

STEWART.—On July 29, at Preston, the wife of Major Walter Stewart, M.B.E., R.A.M.C.—a son.

VINE.—On Aug. 4, at Cambridge, the wife of Dr. Maudsley Vine—a son.

WATKINS.—On July 31, in London, the wife of Dr. P. F. A. Watkins—a daughter.

WRIGHT.—On Aug. 1, at Woking, the wife of Dr. R. B. Wright—a son.

MARRIAGES

CRAWFORD—KELSEY.—On July 29, at Shrewsbury, Frank John Hamill Crawford, M.D., to Louise Kelsey.

DALY—McVERRY.—On Aug. 4, at Rostrevor, co. Down, Dermot Alexius Daly, M.B., to Catherine Augustine McVerry.

WILSON—MARSDEN.—On July 17, Brian Douglas Raymond Wilson, M.B., to Violet Evelyn Marsden.

DEATHS

AITKEN.—On July 29, at Plymouth, Alexander Gardner Aitken, M.B. Glasg.

ALLARDICE.—On Aug. 2, at Newcastle-under-Lyme, Staffs, William Clachan Allardice, J.P., M.D. Glasg., F.R.C.S.E.

CUNNING.—On July 29, at Reigate, Joseph Cunning, M.B. Melb., F.R.C.S., F.R.A.C.S.

FERGUSSON.—On Aug. 2, at Goldsithney, Cornwall, James Herbert Fergusson, C.B.E., M.R.C.S., surgeon rear-admiral, R.N., aged 73.

MACKIE.—On Aug. 8, at Sandown, Kenneth William Mackie, M.R.C.S.

STONE.—On July 31, Robert Dudley Algeo Stone, L.R.C.P.I., aged 85.

WACE.—On Aug. 5, in London, Richard Henry Wace, M.B., aged 80 years.

Appointments

POND, D. A. R., M.D. Duke Univ., M.B. Camb., M.R.C.P., D.P.M.: asst. physician, department of applied electrophysiology, Institute of Psychiatry, Maudsley Hospital medical school.

• MILLAR, J. H. D., M.B.E., M.D. Edin., M.R.C.P.E.: physician, Scunthorpe and District War Memorial Hospital.

• Amended notice.

Notes and News

STREPTOMYCIN REGULATIONS

REGULATIONS have been made by the Minister of the Secretary of State for Scotland, and the Minister of and Local Government for Northern Ireland, after with the Medical Research Council, bringing within the scope of the Penicillin Act, 1947. The these regulations, which came into force on Aug. 1, is streptomycin and preparations containing streptomycin be supplied to the public only by or in accordance with directions of doctors, dentists, or veterinary surgeons, registered pharmacists on the prescription of doctors, denti or veterinary surgeons, and may be administered only by in accordance with, the directions of such qualified pra tioners. Though supplies of streptomycin have increase is still generally available only through the hospital serv The regulations anticipate the time when its use may extended. As with penicillin and preparations penicillin, pharmacists and authorised sellers of poisons be able normally to dispense a prescription for stre and preparations containing streptomycin only once and more than three months after the prescription was if, however, the prescription directs that it may be di on a specified number of occasions or at specified interval a specified period, it may be dispensed in accordance that direction.

VACANCIES IN PRACTICES

EXECUTIVE councils are reminded in a letter from Minister of Health that it is for them to inform the Med Practices Committee when a doctor notifies his intention withdraw from the medical list or when his name is remo from the list. At the same time they are to report to committee on the need to fill the vacancy; and it may assumed that the committee will normally accept the coun view. The council will also have to decide whether to advert any vacancy which the Medical Practices Committee agreed exists. In the case of withdrawals from the list which normally three months' notice is required), the Minis considers that vacancies should usually be advertised in medical and local press in ample time to allow a succes to be appointed before the outgoing doctor withdra Similarly, where an area is under-doctored, councils will to use their power to advertise. In the case of sudden de however, it is suggested that, to avoid delay, the vaca should be filled from any applications already recei subject to the views of the local medical committee. W a doctor dies suddenly, one of the following three tempo arrangements may be made, normally for not more two months: (1) the executive council may arrange other doctors in the locality to conduct the practice porarily; (2) the person acting on behalf of the estate sh be given the chance of appointing a locum tenens, pen the filling of the vacancy; or (3) failing this, the exe council may themselves, after consultation with the medical committee, appoint a locum tenens. A procedure may be followed if a vacancy occurs for some rea other than death and it cannot be immediately filled. Minister has decided that, after all, applications for consen employ an assistant should not, after they have been sidered by the council in consultation with the local med committee, be referred to the Medical Practices Commit unless: (a) the doctor making the application already empl an assistant; (b) the council proposes to refuse consent, (c) the Medical Practices Committee has notified the cou that the area already has sufficient doctors. Applications assistants for inclusion in the medical list will still nec be referred to the committee.

CONGRESS OF INDUSTRIAL MEDICINE

THE ninth International Congress of Industrial Medi will meet in London from Sept. 13 to 17 under the of the Commission Internationale Permanente pour Médecine du Travail. Lord Moran, P.R.C.P., will preside the opening of the congress, when Mr. G. A. Isaacs, Min of Labour and National Service, will give an address. Webb-Johnson, P.R.C.S., will be in the chair at the clo session, when the speaker will be Mr. G. R. Strauss, Mini of Supply. Both of these meetings will take place in Central Hall, Westminster. The scientific sessions will be nearby in the Caxton Hall and the Alliance Hall. The liminary programme,

THE AGRICULTURAL WORKER

G. F. Keatinge
M.A., M.D. Dubl., M.R.C.O.G., D.I.H.
CHIEF MEDICAL OFFICER TO THE BUTTERLEY CO. LTD
R. Littlewood

"One of the great lessons of history is that no nation can be stronger than its agriculture."—President Truman.

This country is short of food now and probably will be for some years. Increased food production is essential not only to save dollars but also to avert famine. Estimates of the additional labour force needed in agriculture this year vary from 20,000 to 80,000 regular workers, but no-one can say where even 20,000 workers are to be found. If they cannot be found, as seems probable, there are two alternatives—severe undernourishment within the next few years, or such an increase in the output per man-year as will enable the farming industry to reach the targets it has been set.

This paper is an attempt to investigate what contributions industrial and social medicine can make to assist British agriculture in its task. It analyses the causes, economic, political, and social, of the drift from the land which is the cause of today's shortage of agricultural workers, and, reviewing the conditions under which the farm worker earns his living, suggests ways by which his efficiency and status can be improved. Though we have felt for some time that such a study should be made we must acknowledge that the impetus came from the inspiring article on coalminers (Morris 1947) and the reflection that food is as important as coal to the national recovery.

The years 1840–70 were a golden age for British farming. About 1873 a period of depression began which, except for the artificial boom during and immediately after the first world war, lasted until 1939. Despite occasional good years farming continuously declined in importance and prosperity. Our farmers fought a losing battle against overseas farmers, who, cultivating fertile virgin land, had low costs of production and had, for allies, improved and new methods of transport, long periods of falling prices, a run of bad harvests in Great Britain, and, above all, our policy of free trade, which lasted from 1846 to 1931.

Owing to the rapid growth in population and the changes in the types of food demanded by workers with rising standards of living, our food requirements increased until by 1931 they were almost double what they were in 1861; and imports were essential because by 1870 there was as much land under cultivation as was possible under free trade (Astor and Rowntree 1938). Cheap food, moreover, was vital for the maintenance of the vast wage-earning community.

The battle against foreign competitors became a series of rearguard actions in which the British farmers fell back on products in which they enjoyed a naturally sheltered market. Since it was useless to compete with the American and antipodean producers of wheat and after the development of cold storage) meat, they concentrated on perishable foods, such as dairy produce, eggs, vegetables, and on the more expensive fresh meats. This involved a change from arable to grass farming. The acreage under permanent grass increased by over 0% between 1870 and 1938 (Addison 1939). Nearly ,500,000 acres, an area greater than the whole of Wales, was lost to the plough.

The more the land was laid down to grass, the less was the amount of employment offered by the industry. The conversion of ploughland to pasture reduced the labour employed by 7–9 men per 1000 acres (Ernle 1927), but this was often counterbalanced by the additional labour needed to look after the increased number of stock. The change, accompanied by a more efficient use of labour and by increasing mechanisation, was bound to reduce the number of agricultural workers. But the fall was an absolute decline, which was all the more surprising in view of the unprecedented growth of the population, which increased from 26,000,000 in 1871 to over 46,000,000 in 1937.

The Drift from the Land

The drift from the land was not confined to the nineteenth century or to this country. Movement away from the land has been, and still is, a feature of all developing countries, and such movement seems inevitable in a competitive world economy. Industrialisation, with its demand for labour, inevitably brings a flow of workers from agriculture to the factories of the towns. The decline in the rural population from 1881 to 1921 in some leading industrial countries was as follows (White and Shanahan 1932).

Rural population as percentage of total population

	1881	1891	1901	1911	1921
England and Wales..	32·1	28·0	23·0	21·9	20·7
Canada	..	68·3	62·6	54·6	50·5
U.S.A.	71·4	64·6	61·0	54·2	48·6

The industrial revolution began earlier in Great Britain than it did elsewhere and developed more rapidly. It speeded up the drift to the towns which the enclosures of the eighteenth century had already quickened. The Education Act of 1870 and the enfranchisement of the agricultural worker in 1884 gave additional impetus. Compulsory education and the possession of a vote meant that the countryman was at last brought into contact with the outside world and learned of the opportunities which it offered. When he lost his job or wanted to better himself he emigrated or, more often, migrated to the towns. The rural exodus varied from time to time and from place to place, being greatest in bad seasons and in districts adjoining industrial areas. It was most notable in the inter-war years. In 1921–24 the total number of workers, male and female, averaged 816,000, whereas in 1938 the number had declined by over 25% to 593,000 (Committee on Land Utilisation in Rural Areas 1942).

LOW WAGES AND LONG HOURS

One of the principal causes of this drift was the disparity between agricultural and industrial wages. There was a wide difference between the average wage of an agricultural worker and that of an unskilled labourer in industry, in spite of the fact that in agriculture even the general worker must be highly skilled. Throughout the nineteenth century the wages of town labourers were generally about half as high again as those of farm workers (Astor and Rowntree 1938). In the twentieth century the wages position can be seen from the following estimates made by Bowley (1937):

Average earnings of men and boys (shillings per week)

	1906	1924	1931	1935
Coalmining ..	31·5	53·0	45·2	44·5
Building	..	59·9	58·2	56·2
Textiles	22·9	51·0	48·0	49·2
Agriculture ..	18·3	31·5	35·0	35·7

Regulation of wages, introduced during the 1914–18 war, was made permanent by the Agricultural Wages (Regulation) Act, 1924, which empowered county committees to fix minimal wages. This brought some improvement in the level of wages, but in 1936, when unemployment insurance was first extended to agricultural workers, in some counties a land worker with a family, by obtaining an industrial job and qualifying for benefit, could receive more as an unemployed industrial worker than as an employed agricultural worker (Astor and Rowntree 1938). It is true that some agricultural workers had certain perquisites, such as low rent and

In the second part of the film this difference of cultural standards becomes even more apparent. The office of the Child Study Association, where parents apply for first-aid regarding their children's behaviour and upbringing, is impressively large and has about it the busy bustle of a railway station before Bank holiday. Mothers are interviewed by what are apparently social workers, and the children are not seen at all and there is no hint of psychiatric help for anyone. Rather curiously the only child shown in a clinical set-up is doing a Rorschach test.

From the comfortable bourgeois families to the rapid and easy successes in treatment, there is little that a British child-guidance worker will recognise as typical of her work. In fact, as a presentation of child guidance the film is so misleading that it would be a pity if it were widely shown in this country. It would be helpful to know how it is viewed by serious child-guidance workers in America.

TELEPHONE RELAY

Ilford Medical Society has arranged for a telephone operator to take urgent calls from local patients whose doctor is off duty, and to put them in touch with another doctor. By this arrangement, forty-four of the fifty doctors in the area are free on Thursday afternoons and evenings and all day on Sundays. Each works at these times one week in twelve. The operator's number is Valentine 1380.

At Birmingham the executive council is reported to have considered a proposal for a telephone system whereby members of the public unable to locate their local practitioner would dial a special number through which they would be connected with another doctor. This system, it has been suggested, should be integrated with that to be operated for the ambulance service, and possibly also with that of the bed bureau.

University of Oxford

On July 31 the following degrees were conferred:

D.M.—G. I. M. Swyer.
M.Ch.—G. O. Jolly.*
B.M.—R. A. Bruce, J. P. Horder, W. G. H. Leslie, M. C. Manifold, David Razzak, C. G. A. Thomas, H. W. James, A. W. Lindsay, M. G. M. Venables, W. H. Taylor, D. P. Winstanley, N. S. C. Gent, F. D. Kelsey, J. R. Sudbury, F. J. C. Roe, Leon Bagratuni, G. E. S. Jones, D. R. Richard, Katharine M. S. Ainley Walker, Barbara E. Porritt, D. F. Magee,* Harold Ellis,* J. E. Cotes,* P. D. Wall, Peter Harrison-Hall,* M. A. Peyman,* John Swithinbank,* B. L. Day,* J. N. Micklem.*

* In absentia.

University of London

Dr. E. P. Sharpey-Schafer, whose appointment to the chair of medicine at St. Thomas's Hospital medical school we announced last week, has been for the last twelve years on the staff of the Postgraduate Medical School of London, where he is now physician and senior lecturer in medicine.

Dr. Sharpey-Schafer, who qualified in 1933, received his medical education at the University of Cambridge and at University College Hospital, where he was awarded the Fellowes gold and silver medals for clinical medicine. Two years later he took the M.R.C.P. After holding house appointments at his own hospital he became R.M.O. at the National Hospital for Diseases of the Heart in London. He has published papers on endocrinology, dealing mainly with thyroid disturbances, and in recent years his research interest has been mainly on circulatory dynamics. He has also published many papers on the circulatory effects of hæmorrhage, the circulation in anæmia, and (jointly) on the pharmacological action of digitalis and other substances in heart-failure.

Royal College of Surgeons of England

Faculty of Anæsthetists.—On July 8 the council of the college admitted the members of the board of the faculty to its new established fellowship (F.F.A. R.C.S.).

Edinburgh Post-Graduate Board for Medicine

On Friday, Aug. 20, at 3.30 P.M., in the anatomy theatre of the university, Prof. E. B. Verney, F.R.S., will give a lecture on Urine Secretion.

Patients' Pictures

A collection of pictures by patients of Netherne Hospital, which have been used as an aid to the understanding of emotional disturbances and are of diagnostic and therapeutic value, will be on view at 1, Grosvenor Crescent, London, S.W.1, from Aug. 16 to 21. The exhibition will be open daily from 10.30 A.M. to 4.30 P.M. and on Saturdays from 10.30 A.M. to noon. Visitors to the exhibition will also be able to see some aspects of the work of the British Red Cross Society picture library and the St. John and Red Cross hospital library.

London College of Osteopathy

A nine-month course, open to registered medical pract tioners, on the theory and practice of osteopathy will begi at the college on Oct. 3. Further information may be ha from the secretary, 24, Dorset Square, London, N.W.1.

British Association of Physical Medicine

A course of lectures suitable for candidates preparing f part II of the diploma in physical medicine will be held o Tuesdays and Thursdays from Sept. 2 to Oct. 7, at 5 P.M. Further details can be had from the honorary secretary of th association, 45, Lincoln's Inn Fields, London, W.C.2.

Royal Institute of Public Health and Hygiene

Dr. Paul Banzet, surgeon to the Hôpital Broussais, Pari will deliver the Bengué lecture for 1948 on Wednesda Sept. 22, at 3 P.M., at the institute, 28, Portland Plac London, W.1. He will speak on the Surgical Treatment o Gastric Ulcers.

Alvarenga Prize

The College of Physicians of Philadelphia have awarde this prize to Prof. Melvin H. Knisely, of the University o Chicago, for his work on sludged blood (see *Lancet*, 194 i, 26).

Foreign Medical Scholarships

The British Council have been asked by 9 foreign countri to recommend candidates for some 40 scholarhips. Th scholarships are given to reciprocate scholarships or othe assistance given by the council and provide for a period of study abroad which varies from four months to two years. The following awards have been made:

The Belgian government a scholarship in tropical medicine to Dr. H. F. Lyon (Edinburgh) and another in dermatology to Dr. R. P. Warin (Leeds); the government of Sweden and the Swedish Institute a scholarship in surgery to Dr. C. Dafoe (Ontario), and in surgery to Dr. J. Scott Baker; the Netherlands government a scholarship in ophthalmology to Miss L. Hodgson (Leeds).

Conference on Infertility

The Family Planning Association are holding their annual conference on this subject at Exeter on Sept. 25 and 26. The speakers will include Mr. D. Young (Congenital Absence of the Vas); Mr. Albert Sharman (Uterotubal Insufflation); Miss Josephine Barnes (Hysterosalpingography in Water-soluble Radio-opaque Media); Dr. M. Hadley Jackson and Dr. H. A. Davidson (Vitamin-E Therapy for Subfertility in the Male); Dr. Mary Barton (Value of the Sims Test in the Diagnosis of Male Infertility); Dr. E. Friedman (Testicular Biopsies); Miss M. Moore White (Testosterone Implants); Dr. R. G. Harrison (Blood-supply of the Testis and its Relation to Sterility); Dr. G. I. M. Swyer (Assessment of Infertility Data). Further information may be had from the secretary of the association, 69, Eccleston Square, London S.W.1.

National Association for the Prevention of Tuberculosis

The jubilee of the association will be celebrated next year, and one of the principal functions will be the Commonwealth and Empire Health and Tuberculosis Conference to be held at the Central Hall, Westminster, London, S.W.1, on July 5, 6, and 7, 1949. The programme will include the following subjects: tuberculosis as a world problem; modern treatment and its results, including P.A.S. and streptomycin; mass X-ray methods; regional county tuberculosis schemes, organisation of comprehensive tuberculosis schemes in British colonies; tuberculosis among nurses and students; eradication of bovine tuberculosis.

A prize of 100 guineas will be awarded for an essay on the control of tuberculosis in a British colony.

The competition is open to doctors of either sex in the British Colonial Medical Service of not more than ten years', nor less than five years' medical standing, of which at least three have been spent overseas. Essays should reach Dr. Harley Williams, N.A.P.T., Tavistock House North, London, W.C.1, not later than March 1, 1949.

Last year the Institution of Mining Engineers and the Institution of Mining and Metallurgy held a conference on Silicosis, Pneumoconiosis, and Dust Suppression in Mines (*Lancet*, 1947, i, 641). The proceedings have been published and are obtainable, price £1, from these institutions at Salisbury House, Finsbury Circus, London, E.C.2.

rather below the average in the list of recorded occupations. The situation is different, however, in the case of women agricultural workers, who, with domestic servants, have the highest rate of illness for any recorded occupational group.

The high labour turnover in the Women's Land Army, much of which is due to sickness and accident, is another indication of the high incidence of sickness among women engaged in agricultural occupations. Exact figures are not available, but a special analysis made in January, 1945, showed the resignation-rate from all causes to be 3·22%, of which 1·22% was represented by sickness and accident (Ministry of Agriculture and Fisheries 1948).

Forestry work is more exacting than the average work performed by a woman on a farm, but it is not without relevance that an investigation into the health of women forestry workers showed their sickness-rate to be high, averaging a loss of twenty days a year by each worker. Many of the women engaged in this work had also lost weight. Though the figures were too small to be of statistical value, 40% of all releases from the Women's Timber Corps in the administrative divisions visited were on medical grounds (Swanston 1944).

Though the mortality-rate for the whole male population in rural areas in England and Wales was 81, that of agricultural occupations was even more satisfactory, being only 73 (Registrar-General 1931). Despite the high level of sickness among single women employed in agriculture, they show a favourable mortality-rate of 87, compared with 100 for all single women living in rural districts.

Nevertheless the mortality among farmers was significantly above the average for septicæmia, suicide, and diabetes, and probably for blood diseases and appendicitis. The mortality among farmers' wives was significantly above the average of that among all married women for maternal causes and exophthalmic goitre, and probably for influenza and non-respiratory tuberculosis. The agricultural labourers had a mortality probably indicating a significant excess for hernia, and an excess not statistically significant for cancer of the skin and non-respiratory tuberculosis. The wives of agricultural labourers showed a probably significant excess for pernicious anæmia and maternal diseases.

The significant excess noted in the farmer for septicæmia and appendicitis, in his wife for maternal causes, and in the agricultural labourer for hernia may well be explained by the difficulty in obtaining prompt and adequate treatment under proper conditions by those living in isolated areas. It is less easy to explain the significantly high incidence of suicide in the farmer, which had also been noted in 1921–23 (Registrar-General 1931). It may be due to solitude and the lack of social contacts in certain cases; on the other hand, the fact that the main motive for attempted suicide was a material one in 87 out of 100 cases investigated by Von Andics (1947) suggests that suicide in the farmer may reasonably be attributed to the anxieties with which he had to contend in the critical years from 1921 onwards. Perhaps the significant excess of exophthalmic goitre in the farmer's wife may bear some relation to the same cause. The excess of non-respiratory tuberculosis noted in the agricultural labourer and the farmer's wife can hardly be dissociated from the ingestion of infected raw milk. Among the conditions showing an excess mortality in farmers and agricultural labourers, however, only cancer of the skin can be held to have a possible occupational basis.

Toxic Hazard.—Despite the favourable situation of the agricultural worker as regards both incapacitating sickness and mortality, the occupational hazards to which he is exposed are not few, and among them toxicological risks have become more frequent owing to the application of scientific and engineering methods to farm work. Thus the use of mercurial compounds, such as tolyl mercuric acetate in treating seeds (Goldblatt 1945) and methyl bromide as a fumigant to destroy insects likely to damage picked fruit, have already caused serious effects on workers (Johnstone 1945). Among other dangerous insecticides are certain of the fluorine compounds which also serve as artificial fertilisers (Hunter 1939), and dinitro orthocresyl, which as a spray has been responsible for the deaths of several workmen. The internal combustion engine has brought with it the risk of exposure to oils capable of causing dermatitis and keratotic changes in the skin (Twort and Lyth 1933). Other toxic hazards are the use of arsenical compounds as sheep dip (Paufique and Bonamour 1946) and the use of tar derivatives in the preservation of timber (Henry 1946).

Diseases of Animals.—The fact that farmers and agricultural workers show a high incidence of certain diseases communicable from animals to man, such as abortus fever, glanders, and anthrax, is comparatively well known; yet the diagnosis is often overlooked, at any rate in the early stages, and this may have serious consequences. In the case of anthrax, for example, though the causal organism is sensitive to penicillin (Murphy et al. 1944), delay in beginning its administration greatly reduces the chances of recovery. Though man is relatively immune to infection with *Erysipelothrix rhusiopathiæ*, the causal organism of swine erysipelas (Barber 1948), it is probable that a good many cases pass unrecognised and that the incidence is greater than is generally supposed (Glover 1948). Aphthous fever occasionally occurs in man (Dlugosz 1943), and ringworm can be transmitted from various animals. Few farms are free from rats, and the farm worker is bound to come in contact with them directly or indirectly. In the former case rat-bite fever may result, and in the latter Weil's disease may be contracted, for it has been shown that contamination of rivers and water-ways is a common cause of this condition (Robertson 1946). There is also reason to believe that the virus causing sway-back in sheep may give rise to disseminated sclerosis in man (Campbell et al. 1947).

Fungi.—Among other fungi especially likely to affect workers on the land is aspergillus, which on inhalation causes "farmer's lung" (Fawcitt 1936).

Accidents.—No reliable statistics are available about accidents in farm work. Though there is reason to think that the accident-rate is not high, some farm accidents can cause very severe injuries and may be followed by tetanus.

Allergy.—Though plants are more liable to cause allergic conditions in gardeners, the agricultural labourer is not immune and may also be affected by animal hairs which can cause a severe reaction in a sensitive person (Britton 1947).

Occupational Disease.—What seems to be a true occupational disease has been described by Bellesini (1947), who states that the hands of milkers show arthritic changes in the terminal interphalangeal joints of the index and middle fingers. He attributes this condition to faulty technique in milking and advocates proper instruction.

Though incomplete, this is a formidable list of hazards; but, when in addition to them the social conditions are borne in mind, it is indeed surprising that the health of the agricultural worker is so good.

The Position Today

The outbreak of the 1939–45 war involved the agricultural industry in a "ploughing up" campaign to lessen the nation's dependence on food imports and to save shipping space. In 1939–44 the arable area was free produce from the farm: but, even when allowance is made for these, the disparity remained great.

The working week in agriculture also compared unfavourably with the industrial working week, which was progressively shortened by the various Factory Acts and the efforts of strong trade unions. By the nineteen-thirties the eight-hour day had been widely secured, but in agriculture the standard hours varied from 48 to 60 a week. In some districts they were considerably more, the West Riding, for example, having customary hours of 67½ a week in summer and 63 a week in winter (Addison 1939). A seven-day week was the rule rather than the exception, and even Christmas Day and Good Friday were holidays with pay only in some counties, in spite of all the efforts of the National Union of Agricultural Workers.

The farm worker had little prospect of rising in the world. With wages barely sufficient to live on it was almost impossible to accumulate capital to farm on his own account, nor could he often hope to rise to the position of foreman or manager, since few farms were large enough or prosperous enough to support such posts.

SOCIAL CONDITIONS

Housing in country areas was generally bad, and many cottages were not even worth the 2*s.* rent charged in some counties. Though some improvements were made during the inter-war years, many rural houses in 1939 had no electricity, no gas, and no water. Surveys made in the 'thirties emphasised repeatedly the shocking housing conditions. The Northamptonshire survey condemned no fewer than 5000 cottages out of 25,400 examined, and in the New Forest out of 700 cottages examined 255 were entirely unfit for human habitation and 208 others needed reconditioning (Addison 1939). A survey carried out four years ago speaks of "conditions dangerous to health and offensive to decency," "water contaminated by sewage and cattle pollution," and "pail closets shared by two or more families, their contents shot onto the nearest rubbish heap or carried through the house for a fortnightly street collection" (National Federation of Women's Institutes 1944). Overcrowding was common, 41,928 houses in rural areas being scheduled as overcrowded under the Overcrowding Act, 1935.

Urban houses were by no means always ideal, but at their worst they usually had artificial lighting and piped water, all too often absent in the country. And even the slum-dweller, overcrowded and insanitary though his home might be, lived in a community and could enjoy the amenities, amusements, and social services that increasingly became the concomitants of town life. The rural community in this respect was only too obviously at a disadvantage.

> It "received unequal treatment in respect of certain important public services, partly because it has been ill-organised for pressing its claims, partly because it has been unable to pay as large a share of the costs as urban communities can, and partly for the obvious reason that such services are more expensive to provide where the population is scattered" (Astor and Rowntree 1938).

Education.—From the educational standpoint rural areas compared unfavourably with the towns. Some schools were closed down owing to the decline in population, and children had to walk miles to school. Others had buildings and sanitation far below modern standards —in 1944 half had nothing but earth-and-bucket closets and often not enough of them (National Federation of Women's Institutes 1944). Rural children were handicapped when competing for scholarships for higher education because the better teachers tended to prefer the towns, where conditions were more congenial (Astor and Rowntree 1938). And our system of education "devised and inspected by city folk intent on producing not peasants but clerks" did not meet needs and made no attempt to foster "an intell and loving interest in country life" (Trevelyan 19,

Health services were also denied to the country-d to some extent. Though the health surveys of 1945 that before the war the agricultural areas were at as well served as the industrial areas on the ba number of inhabitants per hospital bed, the ge hospitals, being in the larger towns, were too far for the countryman. Small villages had no docto baby-welfare clinic, and no maternity home. The di nurse often served two or more parishes, and the mi was not infrequently "the woman from down the l

General Conditions.—The agricultural worker, b educated than his forebears and no longer absorb his own surroundings, suffered from a feeling of isol which, paradoxically, the spread of road transport increased. His stake in the agricultural community vanished with the enclosure movement of the nineteenth century, and he saw before him only ' unending vista of a gradual process of physical exhau in another's service" without any of the compensa that sweetened the existence of the town worker (E 1927). He was the helot of the nation and escaped his slavery whenever he could. Farmers, often weig down with mortgages, could do little to improve co tions for their workers. Higher wages, shorter ho repairs to cottages, all meant increased costs w could not be supported by the low prices they recei for their produce. The nation as a whole seemed indiffe to their plight. A town-bred electorate saw in the de of agriculture the downfall of an aristocratic syst and the natural outcome of the policy of laisser fa and "statesmen regarded the fate of agriculture w all the more indifference because it involved no sc problem of unemployment" (Trevelyan 1944).

AN AGEING LABOUR FORCE

Between the wars agriculture, in common with other depressed industries, was faced with the prob of an ageing labour force.

> "The greatest cause of the drift from the village that been going on for a long time past," declared a former Mini of Agriculture in 1939, "is the feeling of the young men women that they may have a better chance somewhere Where there were 100 employed who were under 21 in there were only 73 in 1931, and the figure has become sm since then" (Addison 1939).

The number of regular workers under 21 decrea by some 75,000 (nearly 44%) between 1921–24 and (Committee on Land Utilisation in Rural Areas 19 Agriculture had always relied for its new entrants family recruitment, but "just as in coalmining, children of farm workers when leaving school chose ot occupations—any work other than farming where wa were so bad and prospects so poor" (Macpherson 1947

Fertility and Health

In view of all these conditions it is surprising to that the traditional fertility of the farm labourer wa little affected. The declining birth-rate common every social and occupational class in the last h century showed the least decrease in the agricult districts (Martin 1937). Innes (1941) has calcula that the decrease in the birth-rate in 1921–31, a per of great agricultural depression, was 21% for agricultu labourers compared with 43% for semi-skilled text workers and 50% for semi-skilled miners.

SICKNESS AND MORTALITY

The Department of Health for Scotland (1937) sho that the incidence of sickness was not unduly h among male agricultural workers, who in 1935, w 14 cases per 1000 men employed, occupied a positi and though school-children and holiday workers under the "Lend a Hand on the Land" schemes give some assistance they are only obtainable in the summer months. The realist policy is, therefore, not "more men," for in the absence of some form of conscription they are unobtainable, but "better men."

BIGGER UNITS

How, then, is the agricultural industry to obtain its better men? Both the Government and the industry are doing much to attain this objective, but in our opinion their improvements do not go far enough.

Omitting all holdings of less than 5 acres, 74% of all farms in Great Britain do not exceed 100 acres, and only 4% are over 300 acres. Agriculture has seen few of the amalgamations and concentrations that have characterised all our other large industries in the last century. The unit of British farming is still the small farm.

There have been good reasons for this in the past. Returns from farming have been too low to attract or to provide the capital which large-scale farming requires; it is physically impossible to extend some farms; and the present system of land tenure favours small farms because there are more prospective small tenants than large ones (Astor and Rowntree 1938). There has been opposition on both sentimental and political grounds. Many people still believe that the yeoman is the backbone of England, and proposals for large-scale farming have usually been condemned as "socialistic," as was the case with the Large-Scale Farming Corporation embodied in the Land Utilisation Bill, 1930 (Addison 1939).

Nevertheless, as an economic proposition there is no question of the advantages of the large farm both for the employment of capital and the remuneration of labour. The small farm is an anachronism which the nation cannot afford to perpetuate in a period of world-wide shortage of food. Nothing so sweeping as collectivisation or nationalisation is advocated, but we suggest that a gradual aggregation of farms into bigger units will benefit both the farming industry and the nation. It is beyond our scope to suggest how this should be done, but it is difficult to imagine its being carried out without some form of compulsion.

Such aggregations of units would give farmers the advantages of easier marketing, bulk-buying, lower overheads, &c. They would facilitate the provision of scientific and technical advice, efficient direction, and up-to-date business methods, such as costing, which is particularly lacking on many present-day farms. They would ensure that the best use was made of machinery and expensive equipment, for, now that the tractor has taken the place of the horse as the unit of farm power, " 200–300 acres of arable land, according to soil, is a minimum for the most efficient utilisation of the implements and machines employed today in the various operations of cultivation and harvesting (Astor and Rowntree 1938). The present trend of scientific and mechanical invention, too, will increasingly favour larger units of production.

Larger farms would do much to raise the status and prestige of the industry. The farm worker would have more opportunity to learn modern methods, and there would be more opportunities of promotion to managerial and supervisory jobs. Agriculture would become even more mechanised and highly skilled, and would require greater knowledge about breeding, nutrition, chemistry, &c. As its "professional" status grew, it would attract men and women who were interested in the land as a way of life that was intellectually as well as spiritually rewarding.

Above all, larger units would make it possible to maintain small communities in which farm workers could lead a social life and continue the team spirit which large-scale farming would both demand and develop. Such communities would not only facilitate the extension of essential services and amenities but also would provide the corporate life which gregarious man needs if he is to give of his best.

MEDICAL SERVICES

Supervision of the worker's health at his place of work has now become a commonplace in many industries, and medical services are firmly established in undertakings under the control of large organisations, such as the big combines and the Ministry of Supply. It has already been shown that the hazards of the agricultural worker are not small, but specialised medical supervision of the occupational health of the agricultural worker has not been practicable in the past owing to the small size of the British farm. If, as we believe is possible, larger farming units can be organised, the principles of industrial medicine can be put into practice.

The new entrant to the agricultural industry can be properly placed in work within his powers only if all workers are medically examined. It is our experience that it is even possible to place disabled persons with certain kinds of defect in suitable jobs despite the arduous nature of much farm work.

Medical examination is of special importance for young persons, who will be spared the disappointment and waste of time entailed in taking up work for which they are not suited. Medical examination of the young person in a factory within fourteen days of starting work is obligatory under the Factories Act, and what is required in a factory is at least as necessary for the farm. Similar precautions are especially necessary in the case of women seeking employment on the farm, and the high incidence of sickness to which attention has been drawn could probably be reduced greatly by proper placement of women in suitable occupations.

The risk of ill effects on the health of man or animals if grain, fruit, or vegetables treated with toxic materials are eaten by them is not so great as might have been anticipated. Thus Spencer et al. (1948) show that, however toxic dinitro orthocresyl may be to the operators using it as a spray, the crops treated with it are harmless by the time they are used as food. Nevertheless, medical advice should be available on the hazards to the consumer in the use of toxic substances for this purpose.

First-aid material and equipment, though almost unheard of on the farm, are as necessary as elsewhere, and the training of workers in their proper use is easy to arrange where there is a medical service. Moreover, if the farm worker of the future is to live a community life, not only will his social conditions and those of his family improve but also his health should be better, provided that the communities in which he lives are not too large. In fact he ought to have the best of both worlds, enjoying, on the one hand, the open-air life of the countryman and the valuable perquisites which provide him with a diet above the average, and, on the other hand, the improved housing, sanitation, water-supply, and general services of the town.

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Continued at foot of next page

increased by over 6,000,000 acres, and the number of workers by 172,000—an increase of 21% (Agricultural Statistics 1947). Owing to the demands of the Services the number of regular male workers fell by 20,000, and the increased labour requirements were met by an increase of well over 100% in female workers (mainly in the Women's Land Army), by the employment of prisoners-of-war, and by an increase in the amount of casual labour (Agricultural Statistics 1947).

The increase in the volume of output over 1939 has been estimated at about 30%, and the increase per man at the highest point was about 10–15% (Ashby 1947). This was largely made possible by increased mechanisation. At the end of the war British agriculture was more mechanised than any other agricultural system in the world (Parker 1947).

To meet the rise in the cost of living and to keep workers on the land wages were periodically increased. When the war ended, a national minimum wage of 70*s*. for a 48-hour week was in force for the male worker.

MAN-POWER

The agricultural industry has been given a target of £100,000,000 worth of extra food by 1951–52. On present prices this represents an increase in production of 20%.

The Economic Survey (1948) assesses labour requirements for this programme as 1,110,000 workers in 1948, rising to 1,170,000 in 1951. Allowing for the recruitment of Poles and E.V.W.'s and for the retention of ex-prisoners under civilian contract, some 10,000 British workers will be needed to achieve this year's total. But the figure is likely to be larger than this, since there may be some loss of regular women workers and, owing to the raising of the school-leaving age, there will not be the usual intake of 15,000 juveniles (Economic Survey 1948).

To prevent withdrawals from the industry the call-up of farm workers for military service has been cancelled for the next two years, and the duration of the Essential Works Order has been extended. The Government's main stimuli for recruitment are propaganda, the improvement of conditions of service in the Women's Land Army, and priority for new houses and hostels for agricultural workers. There is also a system of direction under which directees can choose agriculture from a long list of other undermanned essential industries.

Today's battle for output is partly the problem of *obtaining man-power and getting it into the right places* (Economic Survey 1947). The over-all labour force falls substantially short of what is needed to reach the national objectives; and, in the absence of a system of complete direction such as obtained in war-time, the movement from non-essential to essential industries can be influenced only indirectly. In effect, labour still has freedom of choice, and those undermanned industries which are the most congenial or offer the best opportunities will gain most recruits.

CONDITIONS

Farmers, assured of a schedule of guaranteed prices that gives them the greatest opportunity for good farming that they have ever had (Street 1947), can at last afford to pay decent wages. With a minimum wage of 90*s*. the farm worker is as well off financially as most of his counterparts in the towns. But, though in these days of rationing his perquisites (low rent, free milk, potatoes, &c.) increase his real wages substantially, farm wages are still not high enough to override the attractions of urban industries or to compensate for the lack of amenities in rural England.

The working week in agriculture is much longer than in other industries. Weekend work is necessary for milking and stock-feeding, and overtime is inevitable
during the harvests. The farm worker avera
more than his minimal 48 hours; and, thou
paid for any overtime, he has little leisure
with the factory worker, who often has a five
and invariably enjoys an uninterrupted weeker

Farm work is strenuous and often unpleasant
some men may find an innate satisfaction in
on the land, such reward has its reverse sid
drudgery and monotony entailed in many farn
cesses. The open-air life, too, is not without its di
The sun is not always shining, and the agricultur
necessarily works long hours in inclement weat
no facilities for changing his clothes and no ch
hot bath afterwards.

Adam Smith's dictum that "many inferior
of country labour require much more skill and e
than the greater part of mechanic trades" i
today as it was in the nineteenth century, y
many of us the farm worker is still "Hod
farming is work that any fool can do. This
prestige and status cannot be entirely attribut
"white-collar" scale of social values, for the
itself is in some measure to blame. Though mode
ing demands a high standard of intelligence and me
as well as technical skill, there is no apprentice
no recognised method of *training* (Agricultural E
Research Institute 1942). Nor is the new
certain of obtaining the best advice and instr
for more than half the farms in England and We
farmed by "B" or "C" farmers (Bateson
Above all, owing to the predominance of the sm
medium-sized farms, agriculture offers fewer opport
for promotion than do our other industries. No
that "the boy drifts into it because there is litt
to do, with a determination on his own part, ver
fortified and reinforced by the advice *and encoura*
of his parents, to get out of it directly he is *old*
to leave home and fend for himself" (Agric
Economics Research Institute 1942).

Seventy years of rural neglect have left a trem
back-log, which six years of war and two years of
peace have only too obviously been unable to ma
The social conditions and the amenities of the co
side are very much as they were in 1939. Many im
ments are contemplated, and some are in han
they will all take time and need *labour* and *ma*
which are either unobtainable or scarce. The p
of houses for farm workers affords an example
difficulties with which the industry has to co
Though the Government recognises that there is pr
no single factor of greater importance in the re
and recruitment of agricultural labour than their
to provide the necessary accommodation, so gre
the various shortages that by November, 1947
3075 new houses had been allocated to farm w
(De La Warr 1947).

Future Needs

BETTER MEN

It is not surprising, then, that agricultural emplo
is generally unattractive to urban workers. A m
of its unattractiveness can be seen in the failure
Government's agricultural training scheme for ex-S
men, and in the exodus from the Women's Land
when the war ended. Not until the industry ca
amenities and conditions comparable with those e
by workers in other industries will it obtain the n
of regular male workers it needs. Nor can female
bridge the gap, for not only is it unsuitable for
farm work, as is shown by the wastage-rates f
Women's Land Army and the Women's Timber
but also it is scarcer than in the war years.
unlikely, *too, that in a society of full employment*
labour will be available to the same extent as forn

and though school-children and holiday workers under the "Lend a Hand on the Land" schemes give some assistance they are only obtainable in the summer months. The realist policy is, therefore, not "more men," for in the absence of some form of conscription they are unobtainable, but "better men."

BIGGER UNITS

How, then, is the agricultural industry to obtain its better men? Both the Government and the industry are doing much to attain this objective, but in our opinion their improvements do not go far enough.

Omitting all holdings of less than 5 acres, 74% of all farms in Great Britain do not exceed 100 acres, and only 4% are over 300 acres. Agriculture has seen few of the amalgamations and concentrations that have characterised all our other large industries in the last century. The unit of British farming is still the small farm.

There have been good reasons for this in the past. Returns from farming have been too low to attract or to provide the capital which large-scale farming requires; it is physically impossible to extend some farms; and the present system of land tenure favours small farms because there are more prospective small tenants than large ones (Astor and Rowntree 1938). There has been opposition on both sentimental and political grounds. Many people still believe that the yeoman is the backbone of England, and proposals for large-scale farming have usually been condemned as "socialistic," as was the case with the Large-Scale Farming Corporation embodied in the Land Utilisation Bill, 1930 (Addison 1939).

Nevertheless, as an economic proposition there is no question of the advantages of the large farm both for the employment of capital and the remuneration of labour. The small farm is an anachronism which the nation cannot afford to perpetuate in a period of world-wide shortage of food. Nothing so sweeping as collectivisation or nationalisation is advocated, but we suggest that a gradual aggregation of farms into bigger units will benefit both the farming industry and the nation. It is beyond our scope to suggest how this should be done, but it is difficult to imagine its being carried out without some form of compulsion.

Such aggregations of units would give farmers the advantages of easier marketing, bulk-buying, lower overheads, &c. They would facilitate the provision of scientific and technical advice, efficient direction, and up-to-date business methods, such as costing, which is particularly lacking on many present-day farms. They would ensure that the best use was made of machinery and expensive equipment, for, now that the tractor has taken the place of the horse as the unit of farm power, "200–300 acres of arable land, according to soil, is a minimum for the most efficient utilisation of the implements and machines employed today in the various operations of cultivation and harvesting (Astor and Rowntree 1938). The present trend of scientific and mechanical invention, too, will increasingly favour larger units of production.

Larger farms would do much to raise the status and prestige of the industry. The farm worker would have more opportunity to learn modern methods, and there would be more opportunities of promotion to managerial and supervisory jobs. Agriculture would become even more mechanised and highly skilled, and would require greater knowledge about breeding, nutrition, chemistry, &c. As its "professional" status grew, it would attract men and women who were interested in the land as a way of life that was intellectually as well as spiritually rewarding.

Above all, larger units would make it possible to maintain small communities in which farm workers could lead a social life and continue the team spirit which large-scale farming would both demand and develop. Such communities would not only facilitate the extension of essential services and amenities but also would provide the corporate life which gregarious man needs if he is to give of his best.

MEDICAL SERVICES

Supervision of the worker's health at his place of work has now become a commonplace in many industries, and medical services are firmly established in undertakings under the control of large organisations, such as the big combines and the Ministry of Supply. It has already been shown that the hazards of the agricultural worker are not small, but specialised medical supervision of the occupational health of the agricultural worker has not been practicable in the past owing to the small size of the British farm. If, as we believe is possible, larger farming units can be organised, the principles of industrial medicine can be put into practice.

The new entrant to the agricultural industry can be properly placed in work within his powers only if all workers are medically examined. It is our experience that it is even possible to place disabled persons with certain kinds of defect in suitable jobs despite the arduous nature of much farm work.

Medical examination is of special importance for young persons, who will be spared the disappointment and waste of time entailed in taking up work for which they are not suited. Medical examination of the young person in a factory within fourteen days of starting work is obligatory under the Factories Act, and what is required in a factory is at least as necessary for the farm. Similar precautions are especially necessary in the case of women seeking employment on the farm, and the high incidence of sickness to which attention has been drawn could probably be reduced greatly by proper placement of women in suitable occupations.

The risk of ill effects on the health of man or animals if grain, fruit, or vegetables treated with toxic materials are eaten by them is not so great as might have been anticipated. Thus Spencer et al. (1948) show that, however toxic dinitro orthocresyl may be to the operators using it as a spray, the crops treated with it are harmless by the time they are used as food. Nevertheless, medical advice should be available on the hazards to the consumer in the use of toxic substances for this purpose.

First-aid material and equipment, though almost unheard of on the farm, are as necessary as elsewhere, and the training of workers in their proper use is easy to arrange where there is a medical service. Moreover, if the farm worker of the future is to live a community life, not only will his social conditions and those of his family improve but also his health should be better, provided that the communities in which he lives are not too large. In fact he ought to have the best of both worlds, enjoying, on the one hand, the open-air life of the countryman and the valuable perquisites which provide him with a diet above the average, and, on the other hand, the improved housing, sanitation, water-supply, and general services of the town.

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MENGO ENCEPHALOMYELITIS

A HITHERTO UNKNOWN VIRUS AFFECTING MAN

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MENGO encephalomyelitis virus was originally isolated from a paralysed rhesus monkey (UR 22) which had been captive in the outside monkey runs in the compound of the Yellow Fever Research Institute in Entebbe (Dick et al.). This monkey had not been subjected to any experimental procedures. Subsequently a strain of Mengo encephalomyelitis virus was isolated from mosquitoes of the *Tæniorhynchus* (*Coquillettidia*) *fuscopennatus* Theobald species captured in the monkey runs in the same compound. Strains of the virus were also isolated from another lot of tæniorhynchus (consisting mainly of *T.* (*C.*) *fuscopennatus* Theo.), from a mongoose (ichneumia sp.), and, about a year after the first isolation, from another unused captive rhesus monkey which was febrile but showed no evidence of paralysis. The isolation of Mengo encephalomyelitis virus, its immunological specificity, its pathogenic and physical properties, and the histological lesions which it produces will be described elsewhere. A case of human infection with Mengo encephalomyelitis virus, the isolation of the virus from the patient, and the results of preliminary studies on human immunity to this virus are reported here.

The infection took place in one of us (G. W. A. D.), who was living in the compound where Mengo encephalomyelitis virus was isolated from the rhesus monkeys, the mongoose, and the batch of *T.* (*C.*) *fuscopennatus* mosquitoes, and who had been handling the virus more extensively than had the rest of us. No other infections with this virus have occurred among the European, Goan, or African staff members who have taken part in experiments with the virus or who have lived in the compound.

CLINICAL FEATURES

Incubation Period.—No definite information on incubation period of the infection in man is availal but, if the infection was naturally acquired, and if seems most probable, it took place at Entebbe, maximal incubation period was probably nine d because before that the patient had been absent fr Entebbe for eleven days. If the infection was contra in the laboratory the incubation period was proba five to eight days, estimated from the dates on wh the patient was handling Mengo encephalomyelitis vi before the beginning of his illness.

Onset.—The patient had had an attack of bronchitis, fr which he had practically recovered. On Nov. 22, 1946, felt slightly "out of sorts" physically, but towards even he became mentally very alert. He experienced sl shivering at night. Next day he awoke with a very sev headache, of a "bursting" type, which was aggravated coughing or by quick movements. Later the heada became so violent that he hesitated to cough or to str in any way. He had no fever and proceeded on saf driving 240 miles. On the journey he took repeated doses of aspirin but these did not relieve the headache, though subsequently its intensity was somewhat diminished by alcohol. He took his usual daily tablet of mepacrine at night.

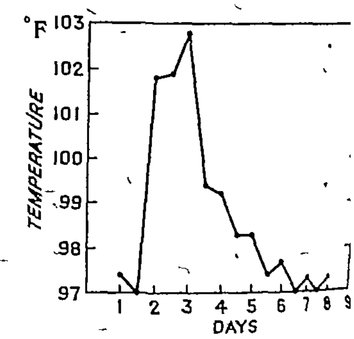

Fig. 1—Temperature chart in human case Mengo encephalitis.

Course.—On the morning of Nov. 24 the patient's headache was still severe and throbbing. About noon he began to shiver, could not walk about, and felt better lyi down in a dark room. He took some 'Veganin' and 2 of sulphadiazine.

He was examined by one of us (A. M. B.) on Nov. 24, whe his general condition was good, though his temperatu was 101·8°F (fig. 1). His pulse-rate was 84 per min. and th pulse was of good volume. His face was flushed and h conjunctivæ injected. His pupils were equal and react briskly to light and accommodation. He had some hyp æsthesia over the scalp and forehead. By the evening h headache was worse and he was delirious, with irritabilit restlessness, and delusions. He vomited three times betwe 7 and 10 P.M. Repeated blood slides were negative fo malaria and other parasites. The patient was given a tablet veganin and morphine gr. $^1/_4$ and had four hours' heavy sle

On Nov. 25 his headache was intense, generalised, an bursting in type, and he had severe photophobia. H tongue was moist and moderately furred. There was defin rigidity of the neck on flexing the chin on the chest. A arm and leg reflexes were sluggish. The plantar reflex wa flexor, and the abdominal reflexes were brisk. Hyperæsthes of forehead and scalp was still present. No abnormality o the cranial nerves was found, but the optic discs were blurred. Blood slides were again negative for parasites. The tota white-cell count was 7300 per c.mm. (polymorphs 65%, lymphocytes 33%, monocytes 2%). The patient was st very restless and mildly delirious and his temperature wa 102·8°F. He had a poor night in spite of medication wi morphine and potassium bromide, but by next morn (Nov. 26) his temperature had fallen to 99·4°F, his headach had become less severe, and he was more relaxed. Pho phobia, neck-rigidity, mild œdema of the optic discs, an hyperæsthesia of the head were still present.

Next day all signs and symptoms diminished, and th patient's temperature was normal, but in the evening he tingling of the right forearm and hand, with some numbn No abnormality of sensation or motor function was dete The white-cell count was 8400 per c.mm. (polymorphs 58 lymphocytes 39%, monocytes 3%).

By the 28th the patient had further improved. He had only occasional twinges of headache, and his

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was still normal. He was allowed to get up. Next day he did not complain of any symptoms apart from paræsthesia of the right forearm. On Nov. 30 he discovered that he was deaf in the right ear and had some weakness of the upper fibres of the trapezius muscle on the right side. The deafness was subsequently shown to be of nerve type.

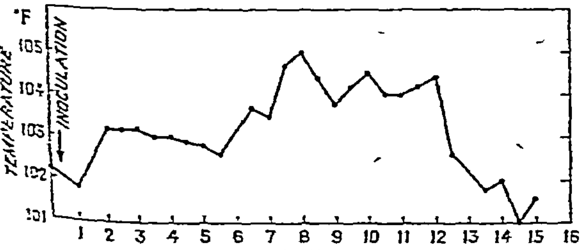
During the first fortnight of convalescence there was some weakness of the muscles of deglutition, but this and the weakness of the trapezius muscle disappeared within about three weeks. Convalescence was uneventful, and the only sequela was slight residual nerve deafness on the right side.

ISOLATION OF VIRUS

In Mice[†]

Blood was taken from the patient on the first day of illness, and the serum was inoculated intracerebrally in 0·03 ml. quantities into each of 8 six-day-old mice and intraperitoneally in 0·1 ml. quantities into 8 other mice of the same age. Of the mice inoculated intracerebrally 1 died on the first day. On the second day 2 of the mice died and 1 was incoördinated and had paralysis of the hind legs; 1 mouse died on the fourth day; 2 mice were sick on the eighth and ninth days and were sacrificed, successful intracerebral transfers being made. There was 1 survivor on the thirtieth day. Of the 8 mice inoculated intraperitoneally with the patient's serum 1 died on the second day and was used for subinoculation purposes. The other 7 mice remained well for thirty days. From the dead mouse a successful intracerebral transfer was made, a 10% Seitz-filtered suspension of the mouse brain being used. By the second passage there was 100% mortality among inoculated mice.

The average survival time from the second up to the tenth passage in mice inoculated with 10% Seitz-filtered mouse-brain suspensions was 1·2, 1·4, 1·0, 1·4, 1·2, 1·0, 1·4, 1·0, and 1·0 days. From the tenth to the twenty-sixth passage (when mouse-brain passage was stopped) the average survival time was usually less than a day. The average survival time of mice inoculated with the human strain of the virus was at first shorter than that of mice inoculated with any of the other strains except the mongoose strain (Dick et al.). Apart from this the clinical signs in mice inoculated with mouse-brain suspensions of the human strain were similar in all respects to those produced by other strains of the virus (Dick et al., Dick (a)).



In Rhesus Monkeys

On the second day of illness the patient was again bled, and rhesus monkey (MR 739) was inoculated intracerebrally with 0·1 ml. of the serum. On the seventh day after inoculation MR 739 had a slight rise of temperature (103·8°F) and next day its temperature was 105°F. Fever continued for five days (fig. 2), but no other manifestations were noted.

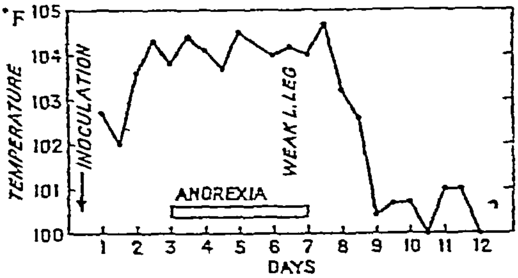


Fig. 3—Temperature chart of rhesus monkey MR 600 subinoculated with eighth-day serum of MR 739.

MR 739 was bled on the eighth day, and mice and a rhesus monkey (MR 600) were subinoculated with its serum. Mice inoculated intracerebrally with 0·03 ml. quantities of this serum behaved similarly to those receiving other strains of Mengo encephalomyelitis virus (Dick et al.). Passages of 10% Seitz-filtered mouse-brain suspensions were successful. The average survival time of the first group of mice inoculated with serum of MR 739 was a day; in the next six passages, in which mouse-brain suspensions were used, the average survival time was less than a day. From the eighth to the twenty-first passage mice were inoculated intraperitoneally with mouse-brain suspension, and the average survival time remained at about a day. Mouse-brain passages were then discontinued, and mouse-brain virus was preserved by freezing and drying and in 50% glycerin (Dick (b)).

MR 600 was subinoculated intracerebrally with 0·1 ml. of eighth-day serum of MR 739. MR 600 exhibited daily pyrexia from the second to the eighth day (fig. 3) after inoculation, and circulating virus identified as the Mengo encephalomyelitis agent was demonstrated in its serum on the second day (no other tests were made for circulating virus). From the fourth to the sixth day after inoculation MR 600 had anorexia, and some weakness in the left lower limb was evident on the seventh day. This monkey recovered completely, and both it and MR 739 developed immunity to Mengo encephalomyelitis virus as demonstrated by an intraperitoneal protection test.

In Guineapigs

Two guineapigs (nos. 173 and 174) were inoculated intracerebrally with 0·1 ml. of second-day acute-phase serum of MR 739; they died within 24 and 48 hours after inoculation. Passage of the brain of guineapig no. 173 was made to two other guineapigs (nos. 175 and 176), which were found dead 24 hours later. In all cases Mengo encephalomyelitis virus was identified in the brains of the dead guineapigs. The human strain of Mengo encephalomyelitis virus was much more virulent to guineapigs (Dick (a)) than was the original strain of virus isolated from the paralysed rhesus monkey (UR 22).

IDENTITY OF THE VIRUS

The serological individuality of Mengo encephalomyelitis virus and the relationship of the monkey, mongoose, and mosquito strains were established by neutralisation tests (Dick et al.).

The virus neutralisation test is used to demonstrate specificity of antibody for a known virus, or, with known antibody, to identify an unknown virus.

Briefly, serum which is suspected of containing antibody is added to a suspension of known virus, or vice versa, suspensions of unknown viruses are added to sera containing known antibody. The serum-virus mixtures are usually allowed to stand at room or incubator temperatures for a certain time, and animals (for the encephalitis viruses usually Swiss white mice) are then inoculated with these mixtures by a route which depends on the pathogenicity

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[†] The mice used in all experiments were descended from the original stock of Swiss white mice from Carworth Farms near New York City. Mice used for experiments were 35–42 days old unless otherwise stated. A group of mice consists of 6 which, under routine, are caged together on weaning at 21 days.

SURVIVAL RATIOS OF MICE IN PROTECTION TESTS USING ACUTE-PHASE AND CONVALESCENT HUMAN SERA NORMAL AND IMMUNE MONKEY SERA MIXED WITH THE HUMAN STRAIN OR UR 22 STRAIN OF ENCEPHALOMYELITIS VIRUS

Virus-serum mixture	Survival ratio* of mice inoculated with serum mixed with virus diluted 1 in							Titr
	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	
Human virus and human convalescent serum	2/6	5/6	..	..	..	..	..	
Human virus and inactivated second-day acute-phase serum ..	..	0/6	0/6	1/6	0/6	..	..	3,170,
M.E. virus (UR 22 strain) and human convalescent serum ..	5/6	5/6	6/6	6/6	6/6	..	..	
M.E. virus (UR 22 strain) and inactivated second-day acute-phase serum	..	0/6	0/6	2/6	2/6	3/6	6/6	2,510,
M.E. virus (UR 22 strain) and third-day acute-phase serum ..	..	..	..	0/6	6/6	..	..	317,
M.E. virus (UR 22 strain) and human immune serum	..	5/6	6/6	6/6	6/6	..	..	1
M.E. virus (UR 22 strain) and normal monkey serum (MR 629) ..	0/6	0/6	0/6	0/6	2/6	6/6	6/6	2,520,
M.E. virus (UR 22 strain) and immune monkey serum (MR 621) ..	6/6	6/6	6/6	6/6	..	..	..	1

* Numerator indicates the number of surviving mice, the denominator indicates the number of mice inoculated.
† Calculated by the method of Reed and Muench (1938). M.E. = Mengo encephalomyelitis. .. = no test made.

of the virus under test. Normal and immune control serum-virus mixtures are also set up and inoculated into groups of mice, the former to determine the titre of the virus suspension used and the latter to check the specificity of the reaction. The number of virus particles neutralised by the known and unknown sera may then be calculated from the mortality ratios of the inoculated mice (Reed and Muench 1938, Paul 1944), and the neutralising effect of the unknown serum may be compared with that of the normal and immune control sera. Similarly the degree of neutralisation of an unknown virus by a specific immune serum may be calculated.

The details of the methods used in immunological studies of Mengo encephalomyelitis virus are described by Dick et al. For the purpose of identifying the virus isolated from the above-mentioned patient the following experiments were done:

A 1 in 100 suspension in saline was made with the brain of a sick mouse which had been inoculated with fifth-passage mouse-brain suspension of the infective agent recovered directly from the human patient. The mouse-brain virus suspension in 0·25 ml. quantities was added to 0·5 ml. portions of known normal and immune sera. The virus-serum mixtures were allowed to stand at room temperature for 20 min., and mice in groups of 6 were inoculated intraperitoneally with 0·06 ml. each of a mixture. All mice remained well after inoculation with the mouse-brain virus suspension mixed with convalescent serum from a monkey (MR 692) which had been inoculated with a known strain (UR 22) of Mengo encephalomyelitis virus. There was no neutralisation of the human strain of virus by sera from known non-immune animals.

A similar experiment was done with second-passage mouse-brain virus recovered from the human patient through rhesus monkey MR 739. The virus was again neutralised by serum from a monkey (MR 692) known to be immune to Mengo encephalomyelitis virus, but not by normal sera.

The final proof of the identity of the infective agent from the human patient was achieved when it was shown that the patient's convalescent serum neutralised both the virus isolated from the patient and a known strain of Mengo encephalomyelitis virus (UR 22 strain); inactivated second-day acute-phase serum from the patient had no such neutralising power. This latter serum was inactivated by heating at 64°C for an hour. At the time of this test the pronounced stability of Mengo encephalomyelitis virus was not known, and it is conceivable that active virus may have been present in the "inactivated" specimen. Accordingly, about a year after these tests were made, another protection test was done, in which the neutralisation effect of human immune serum on the UR 22 strain of virus was compared with that of (1) a known monkey immune serum, (2) a normal monkey serum, and (3) serum taken from the human patient on the third day of illness and stored in a refrigerator. No virus was isolated from this third-day acute-phase serum, and any objection such as m be raised in the case of the original protection t could not apply. The results of these intraperito protection tests are presented in the accompany table, which shows that the convalescent human se protected mice against a test dose of 25,000 M.L.D. UR 22 strain of Mengo encephalomyelitis virus and agai at least 3170 M.L.D. of the strain isolated from human patient.

HUMAN IMMUNITY TO MENGO ENCEPHALOMYELITIS

No specific surveys have been made for the purp of studying the incidence of human immunity to Me encephalomyelitis virus; but sera collected for yell fever immunity tests have been tested for neutrali antibodies to the Mengo encephalomyelitis virus. technique used in testing these sera was similar to t of the neutralisation tests described above and has b discussed by Dick et al. The test dose of virus wa all cases greater than 100 M.L.D. per mouse; usu it was about 1000 M.L.D.

Sera from 237 persons have been tested, and 3 h been found to be immune: 1 from the patient wh case is described here; and 2 from children aged 4 an years, both living on the edge of the Budongo Fores Siba village, Western Province, Uganda. The res of the protection tests, excluding the case described, w as follows:

Area where sera were collected	*No. tested*	*No immune*
Uganda:		
Bwamba County ..	20 ..	0
Budongo Forest ..	61 .	2 (3 3%)
Toro District .. .	20	0
Kalinzu Forest	28 .	0
Various areas	30	0
Northern Rhodesia ..	39 ..	0
Tanganyika	0 ..	0
Miscellaneous	20 .	0
Total ..	236 ..	2 (0 8%)

Dr. C. R. Rainsford, senior medical officer, West Province, Uganda, kindly examined the two immu children and reported that they had no neurolog symptoms. It is planned to carry out more extens studies on the distribution of human immunity to Me encephalomyelitis virus.

DISCUSSION

The Mengo encephalomyelitis virus is so called beca it was first isolated in Mengo District in Bugan Uganda (Dick et al.), but the name is not intend to indicate that the activity of the virus is confined that district, since human immunity towards it has b demonstrated in the Western Province of Uganda.

The symptoms of the illness were those common to all forms of acute encephalitis: headache, irritability, delirium, and vomiting. Symptoms of paralysis were also present. Virus was isolated directly from the patient's blood on the first and second days of illness and identified as Mengo encephalomyelitis virus. Neutralising antibodies to that virus appeared in the patient's serum during convalescence and could still be demonstrated more than a year after the acute stage of the illness.

The source from which the patient acquired the infection is not known, and probably never will be. The patient had more laboratory contact with the virus than any of the other professional or technical staff of the Institute, yet some of the others also had considerable contact. In the period immediately preceding the illness caused by the virus the patient was the only person in residence in the Institute compound. That there was "free" Mengo encephalomyelitis virus in the vicinity about this time is attested by the isolation of the virus from a naturally infected rhesus monkey kept out of doors in the Institute grounds, from mosquitoes caught round the monkey runs, and from a mongoose trapped in the compound (Dick et al). The infection may therefore have been contracted either in the laboratory or naturally. The point is only of academic interest, since immunological studies have already shown that man can acquire the infection naturally.

The virus encephalitides of man may be divided into (1) primary virus infections with a known clinical syndrome, (2) suspected primary virus infections, and (3) infections with ordinarily non-encephalitogenic viruses (Olitsky and Casals 1947). Included in the first group are the encephalitides caused by such viruses as those of eastern (Ten Broeck and Merrill 1933), western (Meyer et al. 1931), and Venezuelan encephalomyelitis (Kubes and Rios 1939), lymphocytic choriomeningitis (Armstrong and Lillie 1934), St. Louis encephalitis (Muckenfuss et al. 1933), Japanese B encephalitis (Takaki 1926), louping ill (Pool et al. 1930), and Russian far-eastern tick-borne spring-summer encephalitis (Silber and Soloviev 1946), and by Sabin's B virus (Sabin and Wright 1934). There is evidence (Dick et al., Dick (a) and (b)) that Mengo encephalomyelitis virus is not identical with any of the known neurotropic viruses, and it may therefore be included in the list of primary virus infections of man.

The viruses responsible for most of the suspected primary encephalitides have been isolated in this laboratory. One of these, West Nile virus, was isolated from a human (Smithburn et al. 1940); and two of them, the Semliki forest virus (Smithburn and Haddow 1944) and the Bunyamwera virus (Smithburn et al. 1946), from mosquitoes. The origin of another (Dick unpublished) is uncertain, but humoral immunity to each of them has been found in man. (It is suggested that Bwamba fever (Smithburn et al. 1941) should not, strictly speaking, be included among the encephalitis viruses, since there is evidence that this virus, though highly neurotropic in mice, does not produce encephalitis in man.) Mengo encephalomyelitis virus might have remained in the group of suspected primary encephalitides if immediate and energetic steps had not been taken to find out the cause of a pyrexia of unknown origin in a man, with signs referable to the central nervous system, which was subsequently shown to be due to this virus.

Though, as already stated, humoral immunity in man has so far been demonstrated to four of the suspected primary encephalitis viruses isolated in Central Africa, nothing is known of the symptoms, if any, which these viruses may produce in man. We are therefore apparently in the unique position of having discovered the ætiological agents of several diseases whose clinical picture remains unknown. This in itself is sufficient indication for the necessity of intensified laboratory and field studies on the virus ætiology of disease in East and Central Africa.

SUMMARY

A case of encephalitis in a laboratory worker was found to be caused by a virus first isolated from animals in the Mengo District of Uganda.

The isolation and identification of this virus are discussed.

Preliminary studies on the distribution of human immunity to this virus have revealed the presence of neutralising antibodies in two children living in the Western Province of Uganda. It is therefore established that the human infection can be contracted naturally.

We wish to thank the Director of Medical Services, Uganda, and the Director of Colonial Medical Research for permission to publish this paper.

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PERFORATED PEPTIC ULCER

REVIEW OF 105 CASES

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PERFORATION remains the most calamitous complication of peptic ulcer. Mortality figures vary from 1·1% (Baritell 1947) to 7·7% (McClure 1940) and to 26% (Martz and Foote 1940), while Monro (1945) states that most hospital series have a mortality of 20–25%.

In 1939 I reported on 100 perforations with 24 deaths (Sangster 1939). I now review 105 with 4 deaths. The reason for this drop in mortality is at first not easy to see, but I believe it to be due to two main factors: patients in the first part of this series, being Service personnel, were in good general health; and cases in the latter half occurred after improvements in anæsthesia and postoperative care had come into use.

The average age in this series was 33·7 years, the youngest patient being aged 15 and the oldest 66 years. The general health of our patients was better than usual. Nearly half of them were in one of the Services, young, active, and outwardly healthy people. Symptoms of peptic ulceration had been present in most of the cases for less than a year. The actual figures are:

No history	24%
History of a year or less	46%
„ „ 1–5 years	25%
„ „ more than 5 years ..	5%

In 3 patients an ulcer had perforated on a previous occasion. The history of 82 patients shows that the average duration of perforation before operation was 8·7 hours. I believe this to be somewhat shorter than is usually found. Two patients in the series were not operated on. The history was typical, and radiography showed gas under the diaphragm, but all the symptoms had subsided by the time of admission. Both patients had travelled to hospital by air.

OPERATION

Operation was performed in 103 cases. It is our custom not to delay operation. Supportive measures, such as fluid replacement, serum-protein restoration, &c., are begun immediately and are continued during operation as necessary, but the operation is performed as soon as the anæsthetist is satisfied with preoperative medication.

The anæsthetist carries a great responsibility. He is entirely responsible for preoperative medication and for the choice of anæsthetic. The usual anæsthetic is nitrous oxide, oxygen, and ether. Curare has been used ever since its introduction and has definitely proved its worth in the 27 cases where it was given.

The operation has in many cases been done by one of the surgical registrars, and in some by the assistant surgeon. The essentials of the operation have been the same. The perforation is closed as rapidly as possible. No attempt is made to clean the peritoneal cavity, nor was drainage ever used. No drugs are ever placed inside the peritoneum.

The method of closure is to take a double bite of the involved viscus, with an atraumatic needle, well wide of the lesion. This suture is tied and left long. The procedure is repeated on the opposite side of the perforation. When these two stitches are lifted up, the perforation sinks into a valley. Two or three further stitches may be inserted to keep the sides of the valley in apposition. The two long end stitches are then used to tie a portion of omentum over the area.

There were 79 duodenal ulcers and 13 gastric, and 8 were placed in a category labelled pyloric. This last group includes those ulcers whose exact location could not be determined without unwarranted dissection.

The above operation was used in all but 5 patients. Four gastrectomies were performed because of massive induration; and one gastro-enterostomy. All these patients recovered.

POSTOPERATIVE TREATMENT

A postoperative régime has been instituted which, we believe, has aided the recovery of many patients—not only those with perforations.

Chest complications are largely prevented by our physiotherapists, who institute supervised exercises the day after operation. There were 7 cases of pulmonary atalectasis, none of which was serious, nor did any call for active interference. Pneumonia developed in 2 patients; one recovered, but one did not (see below).

No patient is instructed to leave his bed, but all are encouraged to do so the day after operation, and we have found that, once early rising is instituted in a ward, practically all patients wish to get up as soon as they are allowed.

Diet is important. A high-protein low-fat diet is instituted 48 hours after operation. Our dietitians provide a high-protein fluid diet based on Varco's (1946) plan modified by peace-time scarcities. The following is the fluid diet devised by our catering officer and dietitians:

VARCO I

		Composition (g.)		
		Carbo-hydrate	*Pro-tein*	*Fat*
7 A.M. ..	1/4 cup oatmeal (strained) ..	0·8	1·4	0·75
	3/4 " skimmed milk	9·0	6 3	0·4
	Glucose	—	—	—
9 A.M. ..	1 cup orange juice	24·0	—	—
	Glucose 15 g.	15 0	—	—
10 A.M. ..	Skimmed-milk powder 120 g. ..	58·8	40·4	1·2
	1 cup skimmed milk	12·0	8·4	0·5
12 (noon)	1 cup orange juice..	24·0	—	—
	Glucose 15 g.	15 0	—	—
2 P.M. ..	1 egg	0·4	6·4	5
	Skimmed-milk powder 30 g. ..	14·7	10 1	0
	Glucose 15 g.	15·0	—	—
	1 cup skimmed milk	12 0	8 4	0
4 P.M. ..	Skimmed-milk powder 120 g. ..	58·8	40 4	1
	1 cup skimmed milk	12·0	8 4	0
	Marmite	—	—	—
6 P.M. ..	1 glass fruit juice	44 0	0 8	—
8 P.M. ..	As at 2 P.M.	42·1	24·0	4
	Calories 2471 ..	303 6	155 9	17

VARCO II

Night Feed—			
Skimmed milk 30 oz.	43·5	29·0	2
4 dried eggs	—	24·0	21
Skimmed-milk powder 6 oz...	87·5	60·0	1
Sugar 200 g.	200 0	23·5	12
'Horlick's malted milk' 5 oz.	90·5	—	—
Calories about 2700 ..	427·5	130 5	41

The use of this diet has been worked out by Mr. Gav Cleland, F.R.C.S., the assistant surgeon, as follows:

1st day ..	Water
2nd day ..	Varco 2 : 2-hourly feeds of 2 oz.
3rd day ..	Varco 2 : 2-hourly feeds of 3 oz.
4th day ..	Varco 1
5th day ..	Varco 1
6th day ..	Gastric (light and high-caloric)

COMPLICATIONS

Thrombosis.—In the last two or three years we ha become thrombosis-conscious; we carefully watch fo thrombosis anywhere, but particularly in the calf muscles The nurses routinely palpate the calves of all post-operative patients, and the finding of tenderness i considered an urgent indication for heparinisation. have no experience of venous ligation for thrombosis.

Subphrenic abscess occurred twice. Drainage in on resulted in recovery, but in the other further complica tions ensued and death followed.

Paralytic ileus was found in 4 patients. All recover after the use of intestinal suction, morphine, and intr venous fluid and protein replacement. One of the patients had sprue, and great difficulty was experience in getting the bowels opened, even after bowel soun had returned to normal.

FATAL CASES

(1) A man, aged 41, admitted having perforated 72 ho before. He was a mental defective and had locomo ataxia. He was "in extremis" and died shortly af operation.

(2) A Polish soldier, aged 24, had perforated 11 hours bef admission. After operation he developed a subphrenic abs which was drained. Two weeks later further exploration the subphrenic space revealed a big necrotic area in liver. Four weeks later he developed pneumonia, follow by empyema. Toxæmia was the cause of death, but th was evidence of gross liver damage before the pneumo appeared.

(3) In a man, aged 56, necropsy showed a fulminati pneumonia.

(4) A man, aged 47, operated on for perforation h hæmatemesis on the 8th, 13th, and 21st postoperative da Transfusions kept him in fair condition, but continu bleeding set in 22 days after operation. Gastrectomy performed 30 days after operation, because blood-tra fusions could hardly replace the amount of blood lost. H way through the operation mobilisation of the duoden opened an abscess. The man died four days later fr peritonitis.

In my former series of perforations (Sangster 19 a patient died from hæmatemesis. It may not be w for one reason or another to perform gastrectomy a particular patient, but I consider that postoperati hæmatemesis should make the surgeon consider procedure.

SUMMARY

A series of 105 cases of perforated peptic ulcer are reviewed.

Of these, 103 patients were operated on, of whom 4 died.

It is suggested that recent advances in anæsthesia and postoperative care were mainly responsible for reducing the mortality to this figure from the 29% found in a former survey.

I wish to thank the medical superintendent for permission to publish this article; and the members of the staff whose efforts have so largely been responsible for the happy results obtained in most of these cases.

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POLYARTERITIS NODOSA

REPORT OF A CASE

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IT is curious that the presence of palpable skin nodules and eosinophilia should still be regarded as the essential diagnostic criteria of polyarteritis nodosa because for many years now the various authorities who have reviewed the subject (Strong 1928, Curtis and Coffey 1934, Harris et al. 1939, and Miller and Daley 1946) have all shown that in only a small proportion of cases is either of these features present.

Furthermore, few people realise that polyarteritis nodosa by no means carries the high mortality originally ascribed to it. Over half the patients recover, and this recovery may include complete resolution of the pathological lesions in the arteries.

Believing that the condition is about to take greater prominence in clinical diagnosis, we offer a brief outline of a further proved case.

CLINICAL RECORD

Mrs. A., aged 25, was admitted to Westminster Hospital on Feb. 2, 1947, in a state of coma, with a history of having had two fits within the past two hours. She had complained of abdominal pain over the preceding three weeks, and this had been unrelieved by alkalis. In the early hours of the morning of Feb. 2 she had a fit lasting a few minutes, after which she recovered consciousness. A second fit followed closely on the first.

An hour later, on admission to hospital, she presented the clinical picture of "rousable" cerebral irritation, but without any localising signs. Apart from incontinence, there were two outstanding clinical findings—hypertension (165/100) and massive albuminuria. There was slight fever, but of far greater significance was the fact that she showed a tachycardia out of proportion to this fever, and irregularity of rhythm. There was also early papillœdema of the left optic disc. The other systems were normal.

Next day she had a succession of ten epileptiform attacks at intervals of about ¼ hour. These ceased after the intramuscular administration of soluble phenobarbitone gr. 3.

She exhibited an irregular pyrexia over the next few days, but improved gradually to the point of coöperation. However, the disproportionate tachycardia and the heavy albuminuria persisted, and the hypertension became progressively more evident, there being a rise in the diastolic pressure to 130 mm., a level which persisted until her death three weeks later. Macroscopic hæmaturia was present on two occasions, and repeated microscopy of the urine in the interval revealed a moderate pyuria with some red cells and a few hyaline and granular casts. The blood-urea level was only 25 mg. per 100 ml.

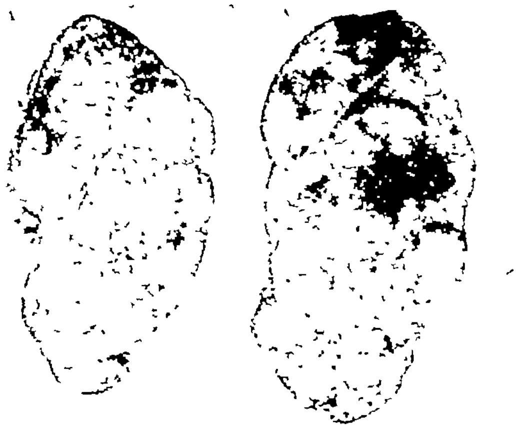

Fig. 1—Macroscopical appearance of kidneys (half-scale).

Within a few days it became apparent that she had developed a peripheral neuritis involving the left foot. The knee-jerk was weak, the ankle-jerk absent, and the plantar response lost in consequence of a cutaneous sensory loss over the foot and extending up the outer side of the lower leg.

The Wassermann reaction was negative, and the cerebrospinal fluid was normal in pressure and content. Radiography revealed no abnormality in skull, but some enlargement of the left cardiac border; the lung fields were clear.

Electrocardiography gave confirmatory evidence of widespread myocardial involvement: there were multiple premature beats in the presence of a rapid nodal rhythm, and arising from various foci. Serial tracings were taken and there was a constant change. One taken three weeks later showed definite right axis deviation, in spite of the fact that the outstanding clinical finding was that of systemic hypertension. The P waves were large and the P-R interval prolonged.

Over the next week or so the hypertension and the albuminuria remained unchanged, the blood-urea rose to 60 mg. per 100 ml., the disproportionate tachycardia persisted, and the leucocyte-count remained raised in the region of 16,000 per c.mm (polymorphs 89%). There was no eosinophilia.

The patient repeatedly asserted that she had no headache, and she was in fact remarkably free from any subjective complaints. Her indifference to her predicament as a whole, and to the paralysis of the left foot in particular, was noteworthy.

On the 16th day she developed acute left heart-failure with presystolic gallop, and extensive pulmonary œdema, but responded very satisfactorily to digitalisation. However, five days later her general condition began to deteriorate rapidly. The blood-pressure rose even further (200/130), epileptiform attacks came on again, and papillœdema became unmistakable in both eyes. A blood-count showed a persistence of the leucocytosis at 18,000 per c.mm. (polymorphs 91%),

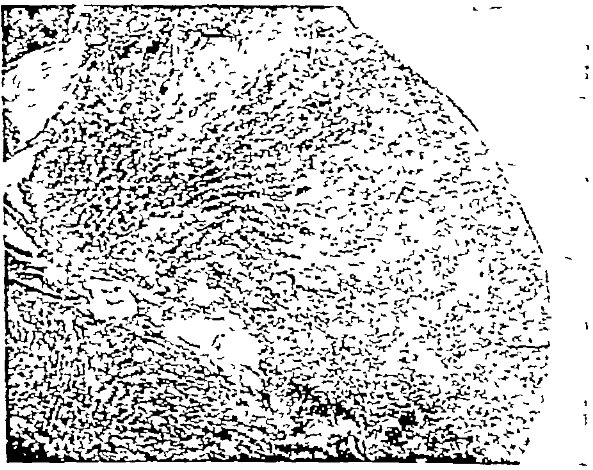

Fig. 2—Section of kidney, showing multiple small infarcts.

and blood-urea remained at 60 mg. For the last few days of life continuous morphinisation was required to control the epileptiform attacks. The blood-pressure rose further, until as a result of myocardial failure it fell shortly before death.

The total duration of illness was about seven weeks. The patient maintained a tachycardia throughout her illness, and that this was constantly disproportionate to the temperature.

POST-MORTEM FINDINGS

The outstanding macroscopical finding was extensive infarction in the kidneys (fig. 1). The infarcts were both old and recent and caused contraction and gross lobulation of the kidneys. Fig. 2 is a section of one of the kidneys, and strikingly demonstrates the secondary effects of the vascular lesions. It shows multiple infarcts, surrounded by a zone of hyperæmia, with areas of normal kidney tissue intervening.

The heart showed considerable hypertrophy of the left ventricle and minute white nodules just under the visceral pericardium and arranged along the track of small superficial blood-vessels (fig. 3); microscopy revealed that these consisted of a fibrous reaction round the vessels where the walls had given way as a result of fibrinoid necrosis. There was also a small area of infarction in the muscle of the left ventricle at the apex. The main branches of the coronary arteries were normal.

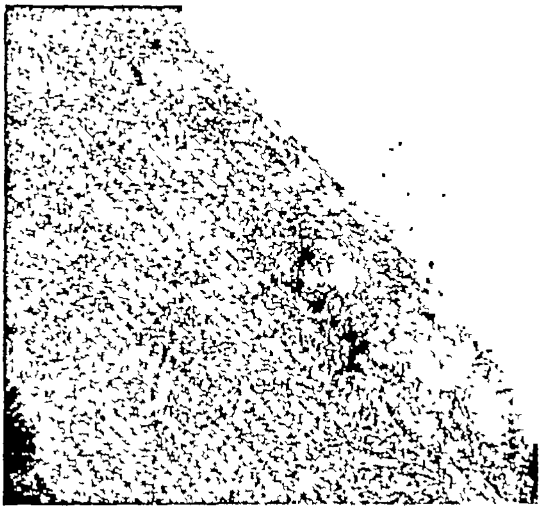

Fig. 3—Surface of heart, showing nodules along course of small pericardial vessels.

The spleen showed a solitary healed infarct. No significant abnormality was discovered in the brain.

The microscopical appearances were essentially similar in all parts, but were best illustrated in the small myocardial and renal vessels. At points along the course of the arterioles areas of necrosis in the walls were found, and segments of the circumference were absent. Thrombosis occurred within the vessel, and at the point of a local breach in the wall the neighbouring tissues had been invaded. Various stages of this process were seen in different sections: in some places fibrinoid necrosis of the wall and early thrombus formation; in others organisation of thrombus and surrounding inflammation. Most of the lesions, however, were in the stage of "healing"; the thrombus within the vessel was well organised and in some cases had even recanalised, and considerable fibrosis surrounded the lesions.

Fig. 4 shows a section of a subpericardial vessel cut diagonally. The vessel wall has given way in several places, thrombosis has occurred, and there is much fibrous reaction round the lesions. Portions of the original vessel wall remain intact. Fig. 5 shows a further stage of healing, in that the thrombus has been recanalised.

In the parts of the kidney which were not involved in the infarction the glomeruli were normal—i.e., there was no associated glomerulonephritis. This is by no means uncommon in cases of manifest polyarteritis nodosa.

DISCUSSION

Though the lesions in polyarteritis nodosa are extremely localised and constant they are very widespread and profuse. Hundreds of small arterioles in all parts of the body are occluded, with consequent production of many small infarcted areas. Since any organ in the body may be involved, the symptoms are protean; and it is this that makes diagnosis during life so difficult.

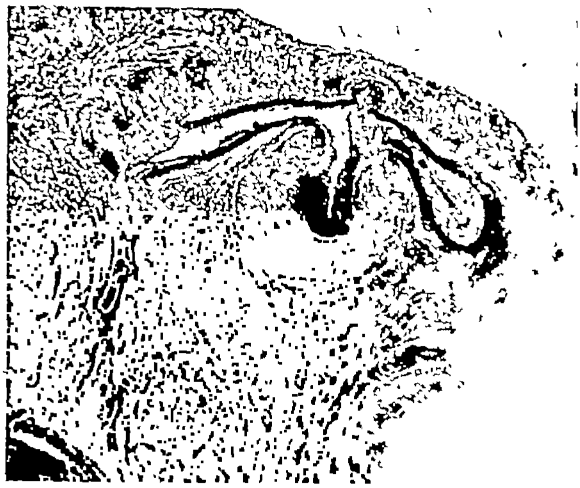

Fig. 4—Oblique section through pericardial arteriole, showing several areas where wall has necrosed and thrombus has invaded neighbouring tissue.

Many observers have attempted to classify polyarteritis nodosa into different types; but, as Miller and Daley (1946) point out, it is questionable whether this is helpful. Nevertheless it is necessary to have some basic framework on which to develop a clinical picture, for it is scarcely scientific to say that a diagnosis of polyarteritis nodosa must be considered when a plethora of symptoms is present not conforming to any established syndrome.

Harris et al. (1939) demonstrated by necropsy that pathologically the kidneys are the organs most often involved; they found lesions in 87% of cases. Polyarteritis nodosa is therefore a diagnosis that should be considered in any case which presents with a "nephritic syndrome" (in its broadest sense), and in which there are one or more additional and apparently incongruous features. The more important of these features are (1) fever; (2) persistent tachycardia disproportionate to the rise in temperature; (3) cardiac arrhythmia, or other evidence of an acute toxic myocardial process, especially a changing electrocardiogram; (4) peripheral neuritis; (5) persistent moderate polymorph leucocytosis; (6) recurrent polyarthritis; (7) abdominal pain; and (8) transient pulmonary infiltrations.

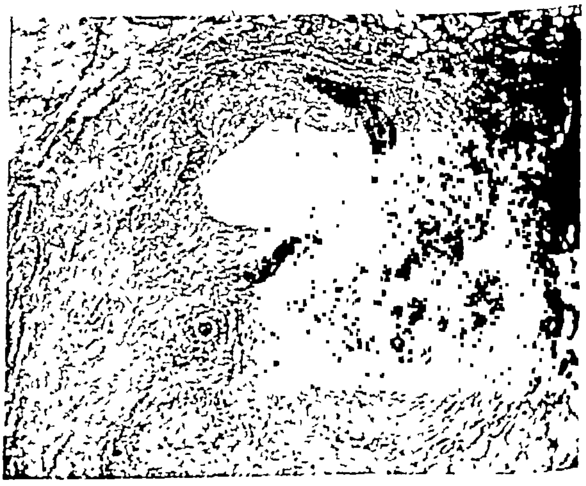

Fig. 5—Cross-section through small arteriole, showing later stage of organisation of thrombus and recanalisation.

Though the term "nephritic syndrome" has been ed here as the basic framework upon which to develop e clinical description, in any particular case the buminuria, the hypertension, the œdema, or all three, ay be absent. The two features which we regard as e most important, and the most often encountered, e (1) a disproportionate tachycardia, especially if pported by electrocardiographic evidence of wide-read myocardial involvement; and (2) a persistent oderate polymorph leucocytosis without any other lequate explanatory cause. These two features were nphasised by Lamb (1914).

SUMMARY

Attention is drawn to the fact that polyarteritis odosa only carries a 50% mortality, and that skin odules and eosinophilia, previously regarded as athognomonic, are uncommon.

A case is reported in which the clinical manifestations ere observed for seven weeks and the diagnosis was onfirmed post mortem.

The clinical picture may be pleomorphic, but there almost always clinical evidence of renal involvement. wo other diagnostic "signposts" are a disproportionate chycardia and other evidence of myocardial involve-ent, and a persistent moderate polymorph leucocytosis.

Our thanks are due to Sir Adolphe Abrahams for permission publish the case and for much help and advice, and Mr. F. King for opinion on the fundal changes.

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MINIMAL REQUIREMENTS FOR MASS RADIOGRAPHY

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DOUBT has arisen about the value of mass radiography that the return may not be commensurate with the xpense, as foreseen from the beginning by many the tuberculosis service. One obvious method of reventing this result is to use mass radiography solely or selected groups in whom tuberculosis is expected to e more than ordinarily prevalent. This is the method sually followed at present. A drawback to the exclusive se of this method is that mass radiography would ome to be associated with susceptibility to tuberculosis, nd to be singled out for mass radiography would be antamount to being labelled a tuberculosis suspect. This seriously limits the use of mass radiography.

A better method, which could include the foregoing, would be to make sure that by adequate propaganda high proportion of the examinees in any group to be urveyed could be expected to attend for examination. There are two reasons behind this statement. First, he common-sense argument that there must be some ninimal effectiveness of mass radiography below which he procedure is not worth while. Some would perhaps place this minimum at a single person and say that if survey discovers one tuberculous person it has been vorth while; but it is not difficult to reject this extreme view. Secondly, it may be expected that if two-thirds f a large group of people agree to participate in a mass- survey and a third decline, the reasons the third to decline will lead to the existence es of tuberculosis per 1000 in the abstaining group than in the two-thirds who participate. In other words, the greater the proportion of persons examined n any group, the greater will be the percentage incidence of tuberculosis discovered, because it will more and more approximate to the true percentage incidence in the whole group.

INCIDENCE OF TUBERCULOSIS IN RELATION TO PERCENTAGE OF PERSONS EXAMINED

Survey	No. employed	No. examined	Percentage examined	Incidence of significant tuberculosis per 1000 examinees
E	8890	4675	52·6	3·6
C	34,150	20,498	60·0	4·1
D	8460	5232	61·9	4·3
B	19,940	14,338	71·9	5·2
A	13,600	10,982	80·8	6·1

That this is no mere speculation is shown by the figures relating to the last five surveys carried out by the Lancashire county council no. 1 mass radiography unit (see table).

The question now arises whether any lower limit can be fixed to the effectiveness of mass radiography, below which its use cannot reasonably be justified. Clearly such a limit must be arrived at from practical considerations. I suggest that, to be worth while from the standpoints of cost, man-power, and effective control of infection, a mass-radiography survey should discover more tuberculosis than it leaves undiscovered. To place the limit any lower than this would incur the risk of actual harm being done by a mass-radiography survey owing to the false sense of security which might reasonably attach to a group which had been so inadequately surveyed that the greater part of its initial content of tuberculosis still remained undiscovered.

If it is accepted that the limit of effectiveness of a survey is the discovery of at least half the tuberculosis in any group, it can be shown that the proportion of persons who must be examined to satisfy this requirement is about 70%. This figure is derived from the foregoing table in the following manner:

It is noted from the table that the variation in the amount of tuberculosis detected by mass radiography is almost directly proportional to the percentage response. This means that if 100% response gave 10 tuberculous persons per 1000 examined, a 40% response would give 4 tuberculous persons per 1000 examined, and the degree of adequacy with which a partial examination represents the percentage incidence of tuberculosis in the entire group will vary with the square of the percentage examined. Hence if 100% examination gives all the detectable tuberculosis, 70% response will give $\frac{(70)^2}{100}$ or 49% of the total tuberculosis in the entire group—i.e., 70% of the total because only 70% are examined; and this figure is again reduced to 70% of itself because the expected incidence of tuberculosis is only 70% of the incidence in a representative sample.

It is possible to obtain a similar result by calculation from the known incidence of tuberculosis in the general population, without the information given by the preceding table, but the calculation is too complicated for general use.

In view of the loss of time associated with the dismantling, transportation, re-erection, and testing of the apparatus each time it is moved, it is scarcely practicable to arrange a survey for less than about 4000 persons, except as part of a larger survey.

SUMMARY

There is a lower limit to the efficiency of mass radiography, below which it becomes uneconomical. It is suggested that a practical measure of this lower limit would be the point where mass radiography leaves undiscovered more tuberculosis than it discovers.

On this basis it is shown that not less than 70% of any group to be surveyed should actually be examined.

Reviews of Books

Clinical Picture of Thyrotoxicosis

PETER MCEWAN, M.B., F.R.C.S.E., consulting surgeon, Bradford Royal Infirmary. Edinburgh: Oliver and Boyd. 1948. Pp. 127. 15s.

MR. McEwan is a Yorkshire surgeon, who has been treating cases of thyrotoxicosis for the last quarter of a century. He has now condensed his experience of the disease into this little book. Its most engaging quality is its unpretentiousness, for it simply describes what the author has himself seen. Theories of causation, and of the mechanism of symptoms, are not discussed. The various phenomena which make up the clinical picture are treated individually in brief chapters—a method which makes the reader's path an easy one. The great variety of clinical types of thyrotoxicosis is much emphasised—perhaps, indeed, over-emphasised. It is not easy, for instance, to accept his contention that thyrotoxicosis is a cause of pain in the arm, though the candid way in which the evidence is presented makes it difficult to quarrel with him. Treatment is dealt with more briefly. The relative merits of surgery and thiouracil are discussed in a fair and balanced manner, and the book concludes with an interesting analysis of deaths from thyrotoxicosis, as recorded by the Registrar-General. The striking peak of deaths in 1936 is probably due, Mr. McEwan thinks, "to the hand of the surgeon," and the subsequent fall to improvement in technique. Even in 1945 at least 70 deaths were attributed to thyroidectomy, as opposed to 4 attributed to thiouracil.

This friendly little book is a welcome relief from the standardised products of modern team-work. It is easy to read, though not always easy to agree with; and it could be improved by revision.

Diagnosis in Daily Practice

BENJAMIN V. WHITE, M.D., assistant clinical professor of medicine, Yale University; CHARLES F. GESCHICKTER, M.D., professor of pathology, Georgetown University. Philadelphia and London: J. B. Lippincott. 1947. Pp. 693. £4 10s.

DESCRIBED as "an office routine based on the incidence of various diseases," this large book is divided into five parts—the diagnostic survey, diagnostic abnormalities, symptoms and physical findings, laboratory procedures, and major diseases. The authors stress the statistical aspect and assess the diagnostic significance of clinical findings largely on their incidence in various conditions. It is, in essence, the method of working from the most probable through the possible to the most unlikely; and though it has much to recommend it, this approach has obvious difficulties. Certainly diagnosis is reached by the linking up of symptoms and signs, but the cross-references and tables needed to correlate all the possible combinations are too numerous and complex. In spite of this, the book contains a mass of useful information, most of it easy to find, some much less so. Tables on the statistical survey and of normal standards, and some of the tables of differential diagnosis, are especially good. The main strength of the book, however, lies in its illustrations and diagrams, some of which—notably the coloured illustrations of skin diseases and diagramatic representations of the distribution and types of rashes—are excellent.

Vitamins and Hormones

Vol. v. Editors: ROBERT S. HARRIS, professor of biochemistry of nutrition, Massachusetts Institute of Technology; KENNETH V. THIMANN, professor of plant physiology, Harvard University. New York: Academic Press. 1947. Pp. 478. $7.50.

THIS well-produced, if rather expensive, volume is a worthy successor to its four precursors, and it carries a cumulative index. Like the others, it contains some broad surveys, which have a wide appeal and (when contemplative and properly critical) a synthetic value, and also some monographs crammed with facts. The monographs can be fully appreciated only by the specialist, who already knows the facts and who may find the account outdated, for it takes time to pro works of this kind.

In the section on *vitamins*, Melnick and Oser's account physiological availability is in the best tradition of rev articles. Thoughtful, critical, and up to date, it warns that vitamin content and availability are not synonym W. J. Darby reviews the physiological effects of pt glutamates in man. He gives a good summary of clinical experiences with them; but many more cases been reported since he wrote it, and his appraisal of therapeutic value of these substances may therefore p too cautious—a good fault in these days of new enthusia In a highly technical account of the synthesis of vitam and related products, it is rather startling to find tha of the references are to U.S. patent specifications in author's name. This article, like those on the vit requirements of the chick and the mouse, aims more at statement of facts than at their critical discussion F Professor von Muralt comes a stimulating essay—of int alike to the physiologist, clinician, and biochemist- the highly specialised work he has been directing in B on the presence and functions of thiamine in perip nerve.

The section on *hormones* opens with a detailed accoun Li and Evans of the isolation, and physical, chemical, biological properties of the hypophyseal growth and adr corticotropic hormones. Both are proteins of mode molecular asymmetry and low molecular weight. Chan and Gordon broadly survey the biology of antithyroid ag covering their physiological and biochemical actions animal species from invertebrates to mammals. S structural formulæ would have made the discussion of chemical nature of these substances clearer.

The rest of this section is devoted to sex hormones. Emm and Parkes discuss the effects of œstrogens on the m mammal. Carter, Cohen, and Shorr, in a lengthy acco of the clinical uses of androgens in women, call attention to t widely different dosages employed with apparently eq success. Many of the benefits reported cannot be ascri to specific actions, and it is hard to allow for the psyc logical reactions of the patient to hormone therapy. may have to abandon the idea of the sex hormones as s stances with single sex-specific actions. Androgens and œst gens both enter into the physiological economy of both se and many of their observed effects seem related indire if at all to sexual physiology. Heller and Maddock h contributed an article, on the clinical uses of testoster in the male, which is outstanding in its orderly developm and in the clear guidance given to the clinician on the v and the dangers of this expensive and fashionable synth hormone. Their final judgment is that "testosterone a single undisputed use. This is its application in [illegible] the signs and symptoms that attend gonadal failure du primary testicular involvement."

Misprints are extremely rare, but an irritating rash abbreviations, such as PGA, MT, ICSH, and PA disfigures some parts of the book.

Surgery of the Ambulatory Patient (2nd ed. Pl adelphia and London: J. B. Lippincott. 1947. Pp. 032. 72 —The doctors who do minor surgery are often inexperien and rely on books. Prof. L. Kraeer Ferguson, of the Univer of Pennsylvania, has provided them with one which can fail to be popular. He writes with a wide experience of subject and gives the sort of detailed information wh makes the difference between good work and bungling. T first part of the book deals with general considerations s as equipment, anæsthesia, dressings, and the conduct operations. The second covers the range of minor surge and a good deal more besides, region by region. The th part deals with fractures and dislocations. There are ab dant illustrations, both photographs and drawings, of excelle quality, and British contributions are well represented in t references.

The scope of minor or outpatient surgery is d not only by medical fashions and resources but by social economic factors. Professor Ferguson includes in his many conditions which would in England probably be t in hospital. Some of these might have been omitted in of a description of alveolar abscess, or of the right way open a quinsy—to mention only two subjects for which looks in vain.

THE LANCET

LONDON: SATURDAY, AUGUST 21, 1948

Adoption

With some 33,000 children in this country lacking family life, would-be adopters usually suppose that their only problem is to pick a congenial child. Feeling that their good intentions are a sufficient guarantee for the child's future, they are astonished at the obstacles often put in their way. Babies seem to be inexplicably scarce; adoption societies ask for details which the adopters cannot believe to be relevant; and the law imposes exasperating delay. All this is the more annoying if they happen to hear of other prospective parents who "got a child without any trouble"—without impertinent questions, without waiting, and without guarantees on either side.

Their bewilderment is fully justified, for the three legal ways of adopting a child in England today have hardly anything in common. The methods are styled adoption through a regular society, third-party adoption, and direct adoption. The last is the least trouble: the mother hands the baby to some sympathetic friend, perhaps over a glass of beer at the local, and the adopter goes through with the necessary legal formalities—or she doesn't. The child thus has no safeguards whatever. Third-party adoption offers him very little more security: a doctor, the matron of a nursing-home, a health visitor, or anybody else, can introduce a prospective parent to a likely baby; this third party is only required (and often forgets) to notify the health department of the local authority seven days before the child is adopted. The interval is intended to give the authority time to send a visitor to see and approve the home; but in practice a week is often too short. And there are other drawbacks to the method. Thus the third party may be far more concerned with the welfare of the prospective parent than with that of the child; and doctors, it seems, are particularly prone to this fault. Feeling sorry for the spinster of 50, the couple who have foregone a family because one partner has hæmophilia or epilepsy, or the neurotic widow, they prescribe a child in much the same spirit as they would prescribe a course of phenobarbitone or a month at the seaside. The results, for the adopter, may be good, at any rate at the outset; but the child is willynilly committed to a long-term engagement. His spinster mother may be old and infirm when he is yet in his teens; his adopted father's health may deteriorate, and with it the ability to support a wife and child; his widowed foster-parent may use him as the sounding-board for her own emotions, and rob him of his peace for life These are important hazards, and they ought to be considered carefully on the child's behalf. There is the further drawback that third-party adoptions are often arranged within a single neighbourhood. The child is brought up among neighbours who know his mother's history and his own; and he is always encountering his real, as well as his adopted, relations. It is only fair to the child to give him a fresh start in surroundings where nothing is known of his antecedents; otherwise he has to make an exceedingly difficult and complex adjustment. Finally, the method is open to one signal abuse: there are matrons of some small nursing-homes who make a regular practice of arranging adoptions. They cannot, of course, take money for this service without bringing themselves into conflict with the law, but they let it be known that they will undertake to find a home for the expected child, and they charge the mother a high rate for her confinement. This is clearly a most improper proceeding, exposing the child to all the risks of casual or careless placement, and the mother to something like sharp practice.

To recognise these facts is to understand more clearly the policy of the adoption societies. They hold that the important party in an adoption is not the prospective parent but the child. The adopters may be seeking an immediate solace or comfort, but the child's whole future is at stake; and he will have to pay in the long run for any error of judgment made by his would-be benefactors. The societies must therefore take their duties seriously, and in so doing many of them have the advantage of the experience that goes with a respectable age. Besides the regular societies, however, many small moral welfare organisations have in recent years registered as adoption societies in order to be able to place illegitimate children who come their way; and though this means that societies—now about 50 in all—are distributed more freely through the country than they used to be, it has the disadvantage that small societies may arrange adoptions for as few as six children a year (which gives them little experience) and are often obliged to place a child in his own neighbourhood.

The law provides general safeguards. Thus, nobody under the age of 25 may adopt a child; and a single man may only adopt a boy, not a girl. But the regular societies make more stringent rules. They have a case-committee which inquires thoroughly into the suitability of would-be adopters, and also into the health and antecedents of the child. As a rule only married couples in early middle life are approved, though occasionally a brother and sister may be accepted as joint adopters. Adoption by a single person or a widow is not encouraged, partly because the societies believe that the child needs both parents if he is to have the best possible chance of developing normally, and partly because the untimely death of a single adopting parent may leave the child stranded. The society's case-committee checks the marriage certificate of the parents, visits their home, and gets credentials of their suitability and health. The child is examined medically before he is accepted; a Wassermann test is done; and the mother has her rights explained to her. The child then goes to the parents on trial for three months—which the societies regard as a good plan because it gives everyone, including the mother, time to think things over. After three months the parents can, if they wish, consider the child for another three months, but at the end of that time they must adopt or give him back. Until the child is legally adopted the mother has the right to change her mind and refuse to surrender him, and this may fall very hardly on adopters who have come to love the child as their own. But the period of delay also has another use: it gives the parents a good chance to assess the intelligence of the child. The trial period usually starts when he is about six months old, and at this age it is not easy to diagnose mental defect, especially of minor degree. During the ensuing six months development in a normal child is exceedingly rapid; and, since the legal arrangements often take a further three months to complete, the parents (and their family doctor) have nine critical months in which to study the child's mentality and rate of development. Adoption means that parents accept full responsibility for the child as if he were their own; and many will consider that they ought to have this chance of studying him carefully before doing so. Nevertheless it is possible to be too cautious. Fathers and mothers normally receive their children as surprise packets, and sometimes the surprise is not pleasant. Some adopters, perhaps, would be willing to take the same risk, especially if it meant earlier adoption. From the psychological point of view, adoption in the first few weeks of life is preferable for both the child and the parent.

In their efforts to safeguard the child it is possible, indeed, that the adoption societies have gone a little too far. They say that since they always have more would-be parents on their books than children, they can afford to take serious trouble about finding the child a good and fitting home. But there is some reason to suppose that more children would come their way, and fewer be disposed of by direct and third-party adoption, if their investigations and precautions were a little less formidable. Their obligations would surely be fulfilled if they ensured that the baby had as good a chance of a comfortable and happy home as the average child, and that the adopters had as good a chance of getting a normal healthy baby as average parents. There is a risk that by being meticulous they may defeat part of their own purpose; they ought, as a matter of course, to be arranging nearly all the adoptions in the country, but in fact they are leaving a large proportion almost unregulated. It is important to remember those 33,000 children being brought up without any home life at all; for if most of these had been adopted in infancy they would, by and large, have had a happier and emotionally more satisfying life than they are getting now. Adopters, it seems, are not scarce; encouragement and propaganda would doubtless swell their ranks; and over some ten years they might greatly reduce the numbers of deprived children brought up in institutions, with a great gain in happiness all round. What if some of the adoptions did go wrong? There would, of course, be individual failures, some of them grievous, as there are now. But the chances are that most would turn out quite well—certainly as well as, or better than, life in an institution. The child's chief need is the direct and personal love of parents: the best physical care, the prettiest clothes, the finest grounds, the kindest nurses, and the most nutritious food are not a substitute for this.

Mastoid Surgery

To some extent mastoid surgery connotes fail in treatment. Though often there seems to be line of demarcation, acute suppurative mastoid can be regarded as a complication of acute suppurati otitis media, which is itself secondary to infectio in or near the nasopharynx. This infection trav by way of the submucous lymphatics up the eustach tube. Treatment therefore aims at arresting infection at its source and at preventing this spread. If the middle ear is already involved by the time the patient presents himself, energetic measures may succeed in segregating and finally eliminating the infection. The means employed are now matters of routine, including chiefly a direct attack on the infecting organism by some form of chemotherapy, and local applications to the site of invasion. this site is in the nose, steam inhalations should be employed—or short-wave diathermy if it is available—and also some method of nasal ventilation or sinus drainage.[1] With energetic conservative treatment of this kind from the outset, and with the patient at rest in bed, the condition will usually resolve.

Yet in spite of unremitting care and comprehensive treatment some cases progress to bone invasion and caries in the middle ear or mastoid process. Unless otherwise explicable, the persistence of purulent otorrhœa, or an abnormal unruptured drum, and deafness for a few weeks indicate such a state of affairs. At this stage a Schwartze mastoidectomy will effect a cure, but if it is not undertaken the infection may become chronic. In this sense every case of chronic otorrhœa can be considered either a failure of the treatment originally given or the result of neglect; and every student, undergraduate or postgraduate, should be taught to think it so. At present far too many cases of chronic infection still appear in the outpatient departments. Fortunately, apart from the social unpleasantness of a discharging ear and gradually increasing deafness, the patients are seldom seriously inconvenienced; but a proportion of them endure acute exacerbations of infection and complications of greater or lesser severity, and these require more energetic treatment —usually some form of mastoidectomy.

The two problems in management of the chronic discharging ear are thus (1) the selection of cases in which complications are probable, and (2) their proper disposal. The types of chronic discharging ear likely to give rise to serious trouble are fully discussed in otology textbooks. Each case must be considered individually and the decision can be made only by an otologist; after which the treatment is entirely a matter of operative technique. The operations usually employed for ablation of the disease are the radical mastoidectomy and its various modifications for disease confined to the attic region. (There are undoubtedly cases where the infection is only in the tympanum or epi-tympanum and does not apparently extend to the mastoid antrum and cells.) The classical operations involve an approach to the middle ear through a postaural incision, and this means removal of a great deal of possibly healthy mastoid bone. Such a route, it must be confessed, seems

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1. See *Lancet*, July 17, p. 104.

nnecessary if the middle ear alone is involved and an be approached in any other way. The fathers of tology, TOYNBEE and his immediate successors, erformed intrameatal operations, for the post-aural approach had not been devised, and lately here has been a return to this type of surgery from an nwillingness to remove healthy tissue. LEMPERT's ndaural approach and TUMARKIN's intrameatal rocedure[2] are both methods of this kind. Undoubtedly hese operations have their uses but, purely on echnical grounds, time and more extensive applicaon by other surgeons are necessary before they an be included as part of the equipment of the verage otologist. Even more important, the proper election of cases is essential, especially for TUMARKIN's rocedure, and though a fair estimate can be made y clinical and radiological examination the fact must be faced that mastoid cells may be infected in egions remote from the antrum. Without exenteraion of such cells the operations will fail, and this isk must be remembered.

The Law and the Judges

THE dropping of the death-penalty amendment to he Criminal Justice Bill, even if it was a concession o prejudice, was necessary to save delay over a measure that commands wide support. It will prove benefit if it later permits a more informed and decisive verdict on the abolition of capital punishment.

But the debates have demonstrated all too clearly the weight and obstinacy of the opposition that conronts penal reform. If anyone has had illusions about the amount of ground gained for rational penology, those illusions must have been dispelled; or it is evident that the progress made is both insufficient and precarious. Many people familiar with the work of social psychologists such as HERMANN MANNHEIM, students of delinquency and penology uch as CYRIL BURT and NORWOOD EAST, and writers ike EDWARD GLOVER who have examined at length nd objectively the dynamic psychology of certain forms of punishment, must be bewildered and disppointed to find responsible persons, concerned in the administration of justice, who still clamour for the reinstatement of flogging, and who, like the statutes they administer, retain ideas of sexual delinquency which were demonstrably outmoded fifty years ago. A study of the opinions expressed by members of both Houses in these debates brings home very sharply the gap between knowledge and practice.

Actual judicial procedure in this country is in general, and within its terms of reference, fair and humane: but the attitude which the courts adopt toward the proven delinquent is often the reverse. The incongruity between the attitude of a learned judge to the sexual offender while he is on trial, and to the same offender when the time comes to pronounce sentence, is sometimes startling, and we are now faced with the anomaly that legislative efforts to reform the penal code can be frustrated by the judges. Thus to combat the increase of crime they seem to put their trust chiefly in an increasing severity of sentences. The latest report of the Commissioners of Prisons[3] contains an analysis of lengths of sentence during the years 1913, 1938, 1945, and 1946 which shows a steady fall in those of less than a month, from 78% of the total in 1913 to 22·9% in 1946, balanced by a rise in all longer ones. To some extent, of course, this is in line with advanced opinion, which sees little use in brief imprisonment as a means of reformation: the longer sentences could conceivably be defended if they gave better opportunity for psychiatric treatment or measures intended to build up social qualities and self-respect. But the truth is that our psychiatric care of prisoners is still extremely sketchy, and, owing to the crowded buildings and lack of staff, measures for their reform have slipped well below the 1939 level. Moreover, it is questionable how far the judges are thinking of opportunities to treat and reform. In the main they do not appear sympathetic to the defence of accused persons based on psychiatric evidence; indeed for some time it has been cynical talk among barristers that to call a psychologist for the defence is tantamount to asking for a doubled sentence. It is not unfair to the courts to say that their prejudices are strongest where those of most laymen are strongest; and it is precisely in those matters which have the strongest unconscious overtones—flogging, sexual offences, murder—that such prejudices operate most clearly. Unfortunately this seems to go with a growing mistrust of all scientific methods in treating and assessing delinquency—a distrust based fundamentally on an archaic faith in retributive punishment. And so long as this attitude persists there is grave risk that attempts at legislative reform will be obstructed and nullified in practice by the courts.

An increase in crime is a warning to us to reform the pattern of our society—to check the growth of insecurity and asocial behaviour which belong to that complex of militarism and centralisation termed, by GEDDES, megalopolitanism. It is also a signal that our conception of penology is obsolete, by the test of results as well as in the light of knowledge. The idea of retributive punishment is as outdated in psychology as the idea of human sacrifice in religion. The Criminal Justice Act is welcome as a step in the right direction, but we should be ready to go considerably further. Some of our prisons, with their anonymity, their slum standards of hygiene, their dietary punishment, and their assault on the self-respect of the criminal are under the same condemnation as the cat and the gallows—they are condemned both by their results and by their theory. How desperately bad conditions now are has lately been explained by the penal reform committee of the Society of Friends.[4]

The conservatism of the judges has in the past gained important victories for the rights of the individual, and the administration of justice, which they represent, is not a field into which medicine can reasonably intrude. But the disposal of convicted offenders is another matter. To attempt to remove all judicial control over such disposal would be a dangerous step for civil liberty: but penology is a field in which psychology and the bench ought to meet on a basis of coöperation, in the interests both of society and of the offender. Unfortunately the attitude of the law today, the cynicism of the courts towards medical testimony, the absurdities of the

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[2] Tumarkin, A. *Lancet*, 1948, i, 708.

[3] Report of the Commissioners of Prisons and Directors of Convict Prisons for the year 1947. Cmd. 7475. H.M. Stationery Office. Pp. 116. 2s.

[4] See *Lancet*, July 31, p. 191.

McNaghten rule, and the fundamental unreason of many features of the penal system which the courts uphold with enthusiasm, all render a direct conflict far more probable than any such coöperation. The outcome of such a conflict cannot be doubted, but it may well be protracted and bitter. Not only the criminal, but the public at large—the chief concern of the reformer as well as the court—will inevitably suffer; and such a struggle between science and authority (already manifest in the difficulty which independent psychiatrists have found when required to testify, or to treat patients under existing conditions) might well do serious damage to Western conceptions of justice and humanity.

Annotations

THE MENTAL HEALTH OF MANKIND

PROSPECTS of righting the world in time to prevent another pandemic war seem so poor, and the obstacles to world citizenship so formidable, that the able and earnest group of psychiatrists, clergy, ethnologists, philosophers, social workers, and others who have gathered for the International Congress on Mental Health inevitably wear something of the forlorn aspect of Jack the Giant Killer. In that trial of wits, however, it was the giant who finally fell to the ground; and indeed in the history of mankind the mere size of a dilemma has never been the deciding factor in victory or defeat. There is no immediate way out of our trouble: but at least, speakers at this congress have shown where we may begin to lay our roads. In a contribution full of wit and factual knowledge Dr. Margaret Mead (reported on p. 303) outlined the principles and standards in the upbringing of children which help to form a responsible personality. Guilt may be good or bad; a sanction which obliges us to observe the duties of citizenship, or a paralysing burden which hampers and delays all mental growth. Aggression may turn inward on the self or outward on the world, and be useful in either phase—in moderation. An exceptionally interesting observation was that made on American and German soldiers who broke down under stress of war: in Americans the conflict was between the acts done and the standards of right and wrong in which the young men had grown up; in Germans the conflict commonly arose over failure to obey an officer, the father figure. If the inculcation of personal responsibility is to be the aim of upbringing, the American and English system has so far achieved it better than other methods.

Other lines of thought have been set out in the statement by the International Preparatory Commission which appeared this week. This commission, drawn from ten countries and appointed on behalf of the congress, met in advance under the chairmanship of Dr. J. R. Rees, to consider and report on group studies. These studies have been sent in from twenty-seven countries where mental-health problems have been considered during the past year by some 5000 men and women in varying professions. Much of the material in this document is general, directed to improving mental-health services in every country, and to providing guiding principles; but it is based on two clear conceptions. Though important elements of the personality are acquired during the early months of life, these early influences are not final determinants; no single stage in maturation decides ultimate success or failure, since good influences later can modify early distortion. And though man is much moulded by his institutions—which may be good or bad—yet institutions are not permanent: they change, and social patterns of behaviour change with them. Thus in our first blundering steps towards world citizenship we are not confronted, as somet appears, by the stone wall of an implacable antago but only by our neighbour's movable hedgerow.

ARTIFICIAL INSEMINATION

THE Archbishop of Canterbury's Commission Artificial Human Insemination included well-balanced elements, ecclesiastical, medical, and legal. Its report is unanimous in accepting "assisted insemination" as a sequel to normal intercourse (or the attempt at i between husband and wife. Eleven out of its twelve members agree that, if assisted insemination is inapplicable, artificial insemination with the husband's semen may be employed. By the same proportion it condemns artificial insemination with semen which is not that of the husband and it recommends that this practice be made a criminal offence.

The chapter of the report which deals with the legal aspects, written by Mr. Justice Vaisey and Mr. H. U Willink, K.C., is important, especially as it describes a "superficial and indeed grossly misleading" a note issued by the Medical Defence Union. It begins by suggesting that artificial insemination by the semen of the husband, assisted by mechanical means, might possibly be a ground for granting a decree of nullity if recourse were had to it with a total wilful exclusion of normal intercourse. As regards insemination by the semen of someone who is not the husband, a medical practitioner who administers it would, in the opinion of these two eminent lawyers, be an accomplice in fornication or adultery; they suggest that the medical profession might feel bound to formulate some new principles as to what is and what is not proper professional conduct in these matters. They are convinced that the use of semen of a donor who is not the husband constitutes adultery: here they quote Lord Dunedin's opinion given in the House of Lords in 1924 in Russell v. Russell:

> "The appellant conceived and had a child without penetration having been effected by any man; she was fecundated *ab extra* . . . the jury came to the conclusion that she had been fecundated *ab extra* by another man unknown, and fecundation *ab extra* is, I doubt not, adultery."

To this dictum of Lord Dunedin they add another from the Ontario Supreme Court's decision in Orford v. Orford (1921) which held it possible that such an act, performed upon a woman against her will, might constitute rape. They think that the device of mixing the semen of the husband with that of a donor or donors would in no way affect the question of adultery. The two legal experts mention with respect an article by Sidney Schatkin [2] on the question of the illegitimacy of the child. They appear to agree that, if the child is not the husband's actual offspring, it will be illegitimate even though the husband has freely consented to the insemination.

They then draw attention to the serious consequences of registering the child in such cases as the child of the husband. This, they say, would be a criminal offence, punishable with seven years' penal servitude, under section 4 of the Perjury Act, 1921. They express surprise at a statement [3] that "the couple are informed that the child will be legitimate if the husband is registered as the father; such registration is demanded, although it constitutes an offence." "The practitioner," they remark, "must be perfectly well aware that the couple to whom he gives his services are intending to make a false and fraudulent record of the resultant birth and is in truth the instigator of and accessory to the crime." They criticise the assurance suggested by the Medical Defence Union as proper to be obtained by the doctor—"that the birth of a child will not defeat

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[1] London: Society for the Propagation of Christian Knowledge, 1948. Pp. 70. 2s. 6d.

[2] *New York Law Journal*, June 26, 1915.

[3] *Brit. med. J.* 1945, i, 40.

the claims of any person to any titles, estates, interests, or funds"—as one that could never properly be given or accepted.

Among other legal aspects of the matter they mention the "involuntary incest" which might occur (through the unsuspected mating of children of a common father) if the practice became frequent. They go on to consider the consequences of the insemination of unmarried women. The motive here might be the innocent one of a desire for motherhood, but it might be a wish to deceive a man into the belief that the woman was pregnant by him. It is, they conclude, the function of the law to prevent, and not to facilitate, fraud and deception. They therefore recommend legislation to make insemination by the semen of some donor other than the husband an unlawful act. Although their other colleagues accept this conclusion, the Dean of St. Paul's in his dissenting memorandum observes that, if the practice is already unlawful, legislation may be unnecessary and anyhow the proposed law imposing penalties would be difficult to enforce.

On the eugenic, psychological, and theological aspects of this problem readers will study the report at their leisure. The legal aspects seem to require urgent attention.

INTESTINAL LAVAGE IN RENAL INSUFFICIENCY

THE developments, made independently by Kolff,[1] Murray,[2] and Alwall,[3] in the treatment of renal failure by extracorporeal dialysis, have stimulated much dormant surgical enterprise in the same field. Experience with peritoneal and intestinal lavage is increasing steadily; and Odel, Ferris, and Daugherty [4] [5] have now added 2 more cases to the records.

In the first of these a man of 22, with a final post-mortem diagnosis of chronic nephritis and bilateral congenital cystic disease, was treated by the passage of a Willson-Sawyer tube 108 in. long, with a duodenal tube attached to the proximal 36 in. The intention was to effect inflow in the second part of the duodenum and outflow by suction through the longer tube, thus gaining dialysis through about 72 in. of jejunum. But intubation was difficult, even with sedatives, because of uræmic vomiting. This became paroxysmal when perfusion was ultimately started. Suction was then tried through a catheter into the tip of the appendix. Tenesmus developed, and a high rectal tube was passed. It was then found that most of the dialysing fluid—dispatched through the nasal tube—was by-passing the appendicostomy catheter and being recovered per rectum. The patient died, stuporose, with pulmonary œdema, within two days. No conclusion was possible about the efficiency of the dialysing fluid in this case ("P" solution of Odel and Ferris [6]), but the experience showed that the chief difficulties to be overcome were technical—intubation during uræmic vomiting, and the recovery of sufficient dialysate to eliminate excessive resorption. It was suggested that the first difficulty might be dealt with by irrigating through an appendiceal tube and recovering rectally, thus substituting the large intestine for the small; and the second, if duodenal intubation were still used, by inserting a much larger tube through a cæcal stoma.

Appendiceal irrigation was tried in the second case. A man of 39 with chronic nephritis (blood-urea 188 mg. per 100 ml.) had a catheter inserted into the appendix and dialysing fluid was passed through the colon to a rectal tube. Lavage was kept up for 64 hours, with some disability from nausea and abdominal cramps. Perfusion had to be stopped, however, when it was found that a hyperchloræmic acidosis with œdema was developing, even though the solution used was believed to be "physiologic" for the intestinal wall. Daugherty and his colleagues [5] comment that the wall of the colon seems to possess characteristics different from those of the peritoneal membrane in so far as exchange of chloride is concerned. Moreover, in 64 hours the blood-urea was reduced only to 112 mg. per 100 ml. They therefore agree with Kolff that for treating renal insufficiency the method is of dubious value.

TOWARDS AN ORDERLY WORLD

THE destructive power of arms has now reached a point at which civilisation could destroy itself almost overnight. Therefore (so it is argued) the nations must either abandon their sovereignty, and submit to some kind of international control, or perish. In propounding this familiar thesis Professor Mander [1] supports it with another—that the world must unite because its several parts are already too interdependent to function efficiently alone. His aim therefore is world unity by agreement, and by way of preparation he provides a factual review of all the attempts so far made to create international order. This review may be described as a constitutional history of the world as a whole; and in telling the story of our past failures and partial successes in constitution building he hopes to convince us of the urgent need for a united structure that will endure.

The reader's first response may well be pleased surprise that there are so many efforts of this kind to record. In broad outline he will already know about the attempts represented by the Hague Convention, by the League of Nations, and now by UNO, to reduce the ferocity and then the probability of war. But he may well be unaware of the enormous amount of detailed work, in many different fields, already done (and sometimes undone) to organise the world. The maintenance of health, the prevention of crime, the establishment of communications, and the conservation of resources—these are all objects that can be achieved more advantageously on an international than on a purely national basis. Again, in matters such as the regulation of labour standards and the protection of minorities, humanistic rather than utilitarian motives have been at work and have gained notable successes. In Professor Mander's view, a major reason for our failure to achieve security has been that we tried to achieve it by disarmament, which is impossible until security has been achieved. But an important movement in the direction of security is the development of a large body of rules which, though they are not enforceable by any international authority, Professor Mander regards as international law. Whatever the nations of the world have agreed to respect he would regard as law, even though their power to enforce it depends only on the continuation of such agreement. Despite setbacks, international law of this kind has been increasing in prestige.

With all this encouragement, however, the critical reader will also find his doubts and misgivings stirred; for a history of the attempts to unite the world in prosperity and peace is, after all, a record of past failures, and the latest edifice of international security already shows ominous cracks. At times peace and world order look as remote as ever, and the explanation must surely be that for most people they do not represent the highest values: they have not been worth purchasing on the terms so far offered. In the last resort nations are unwilling to buy peace at the cost of what they feel to be ideals; and since ideals cannot be proved either true or false, and will remain diverse, it may

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1. Kolff, W. J., Van Noordwijk, J. The Artificial Kidney. Kampen, Holland, 1946.
2. Murray, G., Delorme, E., Thomas, N. *Arch. Surg.* 1947, 55, 505.
3. Alwall, N. *Acta med. scand.* 1947, 128, 317.
4. Odel, H. M., Ferris, D. O. *Proc. Mayo Clin.* 1948, 23, 201.
5. Daugherty, G. W., Odel, H. M., Ferris, D. O. *Ibid*, p. 209.
6. Odel, H. M., Ferris, D. O. *Ibid*, 1947, 22, 305.

1. Foundations of Modern World Society (revised edition). By LINDEN A. MANDER, professor of political science, University of Washington. California: Stanford University Press. London: Oxford University Press. 1947. Pp. 928. 27*s.* 6*d.*

be said that international equilibrium can never be secure enough to justify disarmament. On the other hand, if we cannot prove ideals, we can prove things about them; and if we could prove to our potential opponents that they would be happier by exchanging theirs for ours the period of vigilance would have an end.

CHEMOTHERAPY OF LEPROSY

REPORTS on the efficacy of sulphone drugs in leprosy accumulate. Davey[1] says that at the Uzuakoli Settlement in West Africa 17 patients with lepromatous leprosy, after long-continued but largely unavailing treatment with hydnocarpus oil, were treated for from five to ten months with 'Sulphetrone,' which proved relatively atoxic in the dosage of 3 g. daily six days a week. The general condition of all of them improved, and in all but 2 there was moderate (8 cases) or marked (7) retrogression of the leprotic lesions, though the bacteriological improvement has not so far equalled this. In some patients the drug produced a mild lepra reaction. In 11 of the 17 the lepromin test changed from negative to positive, indicating an allergising action.

Johansen and Erickson[2] record briefly their experience in treating lepromatous leprosy with 'Promizole,' whose effect they find comparable to that of 'Promanide' and 'Diasone.' It is slightly less toxic than the other two but it has to be taken in doses 6–8 times as large; the daily consumption of 12 to 18 tablets over long periods is unpalatable and distasteful, and as its cost is high they propose to abandon it in favour of the other sulphones. With long-continued sulphone therapy 2 of their patients became bacteriologically negative.

Faget and Erickson[3] describe severe toxic effects from the continued treatment of leprosy with relatively large doses of streptomycin. Though benefit has not been conclusively demonstrated, they believe that clinical and bacteriological improvement has followed both injection and local application. Investigation, they think, should go on.

SOCIAL SERVICE

> "We sometimes fail to realise how fundamental to the health of a democratic society is the volunteer—the man who, in addition to doing his daily job, is ready freely to give up part of his leisure for some cause or other that he believes in. . . . These people who care about causes; the adherents, the supporters, the belongers; the Chairmen, the Treasurers, Secretaries, Committee Members; they have a special significance in our society."

Mr. Herbert Morrison, addressing the annual meeting of the London Council of Social Service on July 12, was discussing the statutory pattern which, in our country, fits into and complements the voluntary pattern. As an example of statutory social advance he talked of our educational system. We are short of everything we need, he said: teachers, buildings—everything except children, though we could do with more of them. But already we have 9000 more teachers than we had before the war, and we hope to have nearly 50,000 more by 1952. Over 400 new schools are being built, and 52% of all children are now having dinners at school, compared with 4% before the war; 88% now have free milk. Under the further education and training scheme State scholarships, with full maintenance grants when necessary, have been more than doubled, and these are apart from local-authority awards. Other examples which he quoted were the National Insurance and Assistance Acts, the encouragement of food-production by the State, the National Health Service, and the provisions for the disabled. Interlocking with all these is the work of the bodies like the London Council of Social Service.[4] During the year the numbers of local councils in the London boroughs have multiplied, and—thanks to the powers now given to local authorities to provide entertainment—arts councils are being set up in many places to serve the leisure needs of the community. It has been found that community associations and centres, though they suit some parts of London, are inappropriate to others. In districts where there are large blocks of flats, small housing estates, or groups of prefabricated houses, small clubs are more welcome than neighbourhood units. The council's development officer has helped to start such clubs in many places. The plan has been first to find out by means of a questionary what kinds of things the tenants would like to do in their spare time; and a team of students from the London School of Economics has helped considerably with these surveys. The Goldsmiths' College, New Cross, has provided a training course for those undertaking work at community associations and centres. The welfare of old people is receiving more and more attention, and some 200 clubs have now been established for them in various boroughs. Mobile meals are provided in 17 areas, and 8 homes or hostels for old people have been opened during the year, with more to come. The National Corporation for the Care of Old People is supporting this aspect of the council's work with a grant for two years. Citizens' advice bureaux have been maintained, though—since local authorities are now beginning to set up their own information bureaux—they are fewer than they were during the war. The 67 bureaux directed by the council dealt with 101,130 inquiries during the year; and this year, as a result of new legislation, even more queries are expected.

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1. Davey, T. F. *Leprosy Rev.* 1948, 19, 55.
2. Johansen, F. A., Erickson, P. T. *Ibid*, p. 62.
3. Faget, G. H., Erickson, P. T. *Ibid*, p. 64.
4. Annual Report, 1947–48. Obtainable from the council, 7, Bayley Street, Bedford Square, W.C.1.

GLUCOSE AND PHOSPHATE IN DIABETIC KETOSIS

OPINION has been fairly equally divided on whether to give glucose as well as insulin in the early stages of treatment of diabetic acidosis, while the blood-sugar is still high. From comparison of results in a small series Franks and others[1] argue that its use is disadvantageous. The differences they record in mortality may not be significant, but it is noteworthy that the patients receiving glucose required about twice as much insulin as the controls; the CO_2 combining power of the serum returned to normal more slowly; and there was no difference in the rate of disappearance of ketosis. Study of the chloride and water balances suggest that, through excess glycosuria, the maintained diuresis in the glucose series actually led to cellular dehydration.

The same authors[2] have also made observations on the phosphate metabolism in diabetic coma. It has long been known that there is a phosphorus diuresis during the onset of diabetic ketosis, and that insulin treatment is followed by a sustained fall in phosphorus excretion and in the inorganic phosphate level in the plasma. The effect, therefore, was tried of infusing 500 ml. of a buffered phosphate solution containing at first 1·3 g. and later 2·6 g. of phosphorus. This infusion kept the phosphate level in the blood normal, and direct evidence of phosphate deficiency was afforded by the failure of blood-phosphate to rise and by the absence of phosphate diuresis, even after the larger quantities. From the clinical standpoint the most striking effect of the phosphate was an immediate improvement in the patients' mental condition and diminution in fatalities. There were also signs of improvement in carbohydrate utilisation and a rise in CO_2 combining power.

These results need further confirmation, but they suggest that in treating diabetic coma glucose should not be given until the blood-sugar has fallen towards normal, and that intravenous phosphate infusion should be given about 4–8 hours after insulin treatment is begun.

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1. Franks, M., Berris, R. F., Kaplan, N. O., Myers, G. B. *Arch. intern. Med.* 1947, 80, 739.
2. Franks, M., et al. *Ibid*, 1948, 81, 42.

INTERNATIONAL CONGRESS ON MENTAL HEALTH

THIS congress, under the presidency of Dr. J. R. REES, opened in London on Aug. 11 and continues until Aug. 21. It is three conferences in one. The first, the International Conference on Child Psychiatry, was concerned with personality development in its individual and social aspects, with special reference to aggression; the second, the International Conference on Medical Psychotherapy, took guilt as its main theme; and the third, the International Conference on Mental Hygiene, has this week been considering mental health and world citizenship.

CHILD PSYCHIATRY

Aggression and Emotional Development

Prof. **FREDERICK ALLEN** (U.S.A.) said that aggression was a fundamental characteristic of all living organisms. Although literally aggression meant "going towards," its usual connotation was one of attack and trouble. In theory, aggression had been made the basis of the death instinct; this was in sharp contrast to the speaker's view which equated aggression with life.

The early reaching out of the infant for food, his first aggressive act, was in response to the disturbance of his own internal equilibrium. Two separate life forces thus became interwoven—the infant roused to action by his physiological needs, and the mother figure upon whom he depended for food to satisfy his needs. Parents could become slaves to the child's demands, or they could become autocrats seeking docile obedience. The important point in the differentiating process between child and adult was the constant interplay, coloured by all the factors that made for healthy development or for unhealthy struggles and turmoil. As the expression of the individual's vitality, aggression was translated into action and then into feeling towards the limiting impact of an organising force represented by the parent. A certain amount of frustration was always associated with this impact.

To some extent all habit training was characterised by negative reactions. As the training efforts became charged with anxiety and rigid control, the greater would be the child's need to defend himself against being changed. Aggressive feeling was displaced to important anatomical areas involved in training; and these—the mouth, urethra, and anus—became associated with frustration of individual drives for omnipotence. Rigid and unimaginative efforts to regulate the feeding needs of the infant might accentuate the negative component in the early aggressions, and were the basis of many conflicts between child and parent, and later between child and society. Training in habits of cleanliness, involving urethral and anal control by the child, provided familiar areas of struggle. Negative aggressiveness was often focused on the functions of bowel and bladder. The enuretic boy who said "I want to be dry but I don't want to be made to be dry" expressed the common dilemma that emerged in the struggle between the parent requiring bladder control and the child fighting against it.

In the normal process of differentiation the child found media for expressing and organising his negative aggressions, other than in overt behaviour reaction of the "I will not" type; important media were his play and his fantasy life. Every human being reacted negatively, in some degree, to being changed; and the fantasy life of all people from childhood revealed negatively toned aggressive feelings and ideas related to the organising forces impinging upon them.

> "Each individual," Professor Allen concluded, "has a conflict in himself in organising his potential for aggressive action, either by using and adjusting to the framework provided for him to organise his individuality, or in feeling their restrictive or frustrating power and setting himself against their limiting influences. Out of the interplay rises the dynamic of aggressive action. . . . It is essential to avoid a *point of* view that regards the more positive values of aggressive action only as substitutes and diversions of the malignant quality assigned to aggression as a destructive force. . . . We want more of our children to develop the capacity to 'aggress and find their place.'"

Describing her observations on war orphans, Dr. **NELLY TIBOUT** (Holland) said that their reactions included identification with the aggressors, suppression of all emotion, depression and guilt-feeling, and depersonalisation.

Miss **ANNA FREUD** suggested that much of a person's emotional life was spent in a struggle to rid himself of aggressive feelings. From the admixture of love and hate arose many fantasies, day-dreams, religious conceptions, and utopias; in all the aim was pure love, but this did not exist in the human. There was wide divergence of opinion on the meaning of "aggression." By some it was restricted to attitudes and actions which were hostile, damaging, and destructive, while by others it was taken to include all active and constructive tendencies; by some the term was used to signify the act of aggression only, by others to include the attitude or urge from which the act originated; some schools considered aggression to be an inborn instinctive urge, while others regarded it as the product of environmental influences. According to the Freudian theory the aggressive urges represented one of two fundamental instinctive forces—i.e., the destructive instinct or death instinct. Their counterparts were the sex urges which represented the life instinct. Normally the development of aggression was intimately bound up with infantile sexuality.

In winding up the subsequent discussion, Dr. **EMANUEL MILLER** contended that what was regarded as aggression in an adult might not be aggression in a child.

MEDICAL PSYCHOTHERAPY

Genesis of Guilt

Dr. **H. G. VAN DER WAALS** (Holland) distinguished between "guilt-feeling" which was endogenous, and "guilt" which was not. Psychological studies had made it clear that conscience was capable of doing harm to the personality as well as good; and it was the undeveloped, or archaic conscience of infancy which was harmful. Psycho-analysts properly studied not guilt but guilt-feeling, and its related anxiety—the anxiety, that is, of the ego towards the superego. This anxiety was associated with fear of consequences, and as long as punishment was feared no true conscience developed. Defences against guilt associated with the unconscious need for punishment interfered with the normal conduct of life, and was even disastrous to true morality.

The Rev. Father **THOMAS GILBY** set out the Roman Catholic view, in which guilt was held to be a healthy symptom of recovery, not a morbid condition, and was inherited as part of human nature. Man was a creature, and as such exposed to conflicts—the first being a conflict against the general condition of creatureliness, the second in resentment against his animal nature, the third a conflict between spirit, or mind, and matter. Possibly the sentiment of guilt was at first a sentiment of separation from where one would want to be; and he distinguished "fault guilt" which was a turning away from the good, and "penalty guilt" which was a turning towards something else. The first was the concern of the priest: the second, when it implied turning towards a bogus form of guilt, was of great importance to the psychologist. Expiation itself was a function of health, of being on devout and friendly terms with our environment. Morbid guilt took the forms of desire to assert innocence, desire to seek impossible reassurance, and the fallacy of fixing on another object as a substitute or scapegoat.

Dr. Angelo Hesnard (France) said that morbid guilt (considered as a biopsychological fact, having no connexion with the ethical or social facts of normal guilt) was generally expressed by the "feeling of guilt" and the "need of punishment." In Freud's view, the strict early ethics of the superego—embracing the external prohibitions of the œdipus situation—derive from a primitive human tendency to self-destruction (masochism). Later the growth of sexual needs intensified this masochism (which was, in fact, the aggression which went with *libido turned inwards, on the ego, instead of* outwards) and provoked a new strictness in the superego. The neurotic sense of guilt was the result. Freud's pupils had modified this theory in various ways: tracing the sense of guilt not to primitive masochism but rather to infantile aggressive hate turned inwards on the self, reaction to training of the alimentary functions (Melanie Klein), protection against the danger of punishment, castration or withdrawal of love (Ernest Jones), or desire for punishment as a preventive of frustration (Reik, Alexander). Adler held that the neurotic adopted the attitude of a hero in face of humiliation both as a protection against inferiority feelings, and in an attempt to dominate his environment; while some of the neo-Freudians underlined the social and cultural factor in self-punishment. Regarded subjectively, guilt was behaviour which at the conscious level implied a lapse (without foundation in fact) and its punishment; and which could be recognised, on analysis, as an attempt to adapt to a prohibition threatening a "personal ethical value." It was associated with emotional frustrations and setbacks, and was connected with the œdipus situation. Objectively, it was seen to be behaviour showing the conflict between sexual and aggressive behaviour and the demands of the social and cultural environment.

In the discussion which followed Dr. Ives Hendrick (U.S.A.) noted that guilt in the grown person derived from the child's relation to authority; and it was striking, he said, how often people became in time like the parent they most resented. At a recent conference to study the German character it was observed that a nation had a culture which put into power people of a certain character; and to change the character structure of a nation and its leaders we must do more than change ideologies—we must change the family environment.

Dr. P. J. Reiter (Denmark) thought there was evidence of a primary instinct for detecting what was a good and what an evil action.

Dr. Jenny Roudinesco (France) remarked that stealing in children did not derive from a wish to do wrong but from the knowledge that by their action they could hurt someone else. The *untreated result might be per*manent guilt-feeling or even masochism. Dr. Samuel Lowy defined guilt as the emotion about things done, conscience as the emotion about the choice of things still to do. Unless guilt was satisfying a religious need, he said, it was a morbid phenomenon with no known function. The patient must be encouraged to concentrate on conscience, to say to himself, "How much more energy can I liberate for work in the world by getting rid of guilt." Guilt could be an enemy of conscience.

Mme. Maryse Choisy-Clouzet (France), who had made observations on lions and tigers "because these animals are so ambivalent," felt there was no rigid frontier between psychology and religion where guilt was concerned; sin was the sacred part of guilt, which was a neurosis. (Even a lion who has absent-mindedly eaten his friend, a great Dane, can feel guilt and sorrow it seems.)

In summing up, Dr. Ernest Jones pointed out that two views of guilt had been upheld: either that it was inborn or instinctive, or that it was due to incorporation into the personality of parental and environmental inhibitions. We did not know which was true, and we must work to find out. It was clear, however, that guilt did not develop along a straight line but interacted with other emotions. Thus fear gave rise to guilt, and guilt to fear; hate gave rise to guilt, and guilt to hate.

Guilt and Dynamics of Psychological Disorder

Prof. D. Brinkmann (Switzerland) discussed the pamphlet recently published in Zürich by Carl Jaspers on the "Problem of Guilt." This writer classifies guilt under four headings as *criminal, political, moral,* and metaphysical. In the first case the guilty person has offended against the laws, and the judgments established by the courts; in the second against the government the citizens have been responsible for choosing. Moral guilt arises because he is responsible for his actions, and feels guilt when he offends against his moral standards; metaphysical guilt arises because there is solidarity between man and man, and all are responsible for failure of justice in the world. Professor Brinkmann felt, however, that the moral and metaphysical guilt conceptions in this classification are full of contradictions. For instance, the tragic metaphysical guilt of the ancients cannot be classed with the Christian metaphysic. The Greeks saw man as the opponent of an all-powerful fate, while the Christian idea does not recognise fate at all. Man, in the Christian view, is subject to a personal God; and Western man always falls into the temptation of making himself into a saviour and seeking his own redemption. Guilt, indeed, is not a problem but a mystery; and only by active participation can we illuminate it from within.

Dr. John Rickman described the situation in which the psycho-analyst collects his facts. He listens to whatever the patient says in free association, and regards no two ideas as irrelevant if they occur in the same stream of association. He thus sees guilt in a wide context of personal experiences: not in relation to religious beliefs as the clergy must, not in relation to abstractions as philosophers choose to do, but as the patients find and feel it within themselves. Guilt is regarded as a painful tension arising between an individual and a code of behaviour—sometimes of human origin (the code of conventions in which he is brought up), sometimes of religious origin. The tension thus arises from an interplay of the person with the *environment: from an absorption of part of the environment into the self.* Thus conscience is an incorporation into the personality of parental injunctions. Both parents are loved by the child, though one is the rival in his erotic life; disobedience to the incorporated parental injunction means a pang of guilt and a fear of retribution—and moreover a sense of separation from the parents, and hence of *loneliness and depression*, coupled with the retribution-anxiety. Guilt and anxiety thus interlock, and it is hard to distinguish clinically a pang of guilt from the persecutory anxieties which also limit freedom of action and inhibit social and personal growth. Of various kinds of deep-rooted secondary mental distress, depression and the feeling of persecution, he said, were specially relevant to the topic under discussion. Depressive pain is felt when we have done or intended an injury to a loved object. Persecutory pain comes when we project on to the outer world feelings of hostility which we cannot tolerate within ourselves. When an emotional situation affecting ourselves and those we love d depend on is fraught with too much pain and is pressed, it continues to influence our mental life, and ere is an urge to resolve or complete the unfinished uation, even though we no longer know what it is want to complete. Depressive guilt, which contains large element of love, can be culturally valuable. art of the aggression is turned on the self, instead of to a loved person, and this inturned aggression ovides energy for the superego (or conscience). But e superego draws strength from the loving impulses well. The desire to please and draw nearer to the rents by obedience later becomes a wish to serve and are in the community. The reactions to guilt may a drive to restitution, a compulsive urge to propitiation, denial of the aggressive tendency, absorption in and the same time repression of the aggressive tendency, mpulsive or expiatory life patterns, sexual anomalies, eurotic or psychotic compromises, and even an interest religious and charitable organisations. Can the numbing and distorting effects of guilt on growth be itigated? Much depends on the upbringing of children. is hard for children to grow up in a broken home ithout acquiring an extra burden of guilt. Because his ambivalence the child will always unconsciously el some responsibility for the broken home. A home potentially broken if a parent uses the child's affection a weapon of defence or offence against the other parent. he child's guilt begins early, and so does cultural straint on his aggressive and asocial impulses. By he time he is four he can be described as a "cultural ait." A parent's failure to recognise the child's capacity r guilt is a failure to recognise that he is human.

In opening the general discussion, Dr. J. H. VAN DER OOP (Holland) held that a healthy feeling of guilt, s distinct from a neurotic one, is a useful social factor; nd that the superego is also valuable and important, nce we have now lost our primary instinctive directives. owever, society often demands not the optimal but e maximal degrees of repression, and the resultant nsion helps to cause the aggressive states which lead wars.

Dr. CLIFFORD SCOTT said that the restitutive aspects of uilt are often helpful since they lead us to desire know, understand, and live peacefully with our ighbours. Moreover, the unconscious capacity to ve can be used to resolve the guilty state.

Dr. K. M. ABENHEIMER, a former pupil of Carl Jaspers, plained that the pamphlet criticised by Dr. Brinkmann as about war guilt only, and was written to help the erman people to get some understanding of their own ilt feelings. Dr. W. FURSTENHEIM suggested that ars arise because people identify themselves with their ational idea of "truth," and such national truths may onflict. We must respect each other, and look for a nore general "truth" compatible with that of other eople.

Dr. W. C. HULSE (U.S.A.) reported that when an merican soldier breaks down under stress of war he oes so because of the conflict between what he has done nd what he has been taught is right. When a German oldier breaks down he does so because of guilt towards is officer, who is the father figure. "Have I done what e told me to do?" he asks. Dr. J. FLESCHER (Italy) iscussed the guilt reaction which comes not from what e have done but from what we would like to do; and rs. MELANIE KLEIN described how the introjected gures of the parents are built into the superego—good nd bad figures with persecutory powers. Dr. K. EBROWSKI (Poland) remarked that guilt is a regular nding in excited patients showing disintegration of the ersonality.

Collective Guilt

Miss MARGARET MEAD, PH.D., (U.S.A.) discussed not armful or pathological guilt but guilt as a sanction in society—"good" guilt which makes people behave responsibly, pay their taxes, pick up paper on the street even when no-one is looking, and refrain from throwing their banana-skins where people may slip on them. They behave in this way because they hear the voices of their parents enjoining on them the principles of good citizenship; and this sort of character training depends on the parents acting systematically as though they are better than they are—until, in fact, the child finds them out, by which time it is already too late, and their good principles have been built irretrievably into his personality. In this type of culture, built on good guilt, and found in Great Britain and the United States, the child learns to identify himself with the people in his country and with a political organisation which makes the citizen responsible for the State. In primitive cultures "guilt" character of this type is rare. Few primitive parents will work as hard as is needed to bring children up in this way, and shame is made to take the place of guilt. Instead of the parents saying "If you do that mother won't love you," or "Father will punish you," they say: "If you do that people will despise you." And as they make a habit of talking disparagingly and maliciously of the neighbours, this entails being despised by people you despise. Other societies are run on pride: the child is taught to act so that people he respects will respect him. These others are regarded as an audience and he acts as though on a stage; but a failure to acknowledge status, in such a society, is a deadly insult, and wars may be fought over a slip in etiquette. Elsewhere fear takes the place of shame or pride: any sort of unusual behaviour is thought to be alarming, and the child learns to stick to a rigid pattern in his acts. In one society no action at all is taken except under the spur of anger, and it may take a wife a whole day of loud talk to get a husband angry enough to go out and find food for the family. In some societies members are interchangeable, so that any member can be killed as a substitute for another. In Japan the solidarity of the family is carried to such lengths that every child is capable, by a false step, of disgracing his entire family and suffering rejection as an outcast. The "good" guilt type of character-structure is rare, and has only occurred once or twice in history. It makes for the most responsible behaviour, but that does not entitle those of us who have it, Dr. Mead thinks, to foist it on others. That would be a sort of psychiatric imperialism. We must fit different cultures together by other means than force.

In the general discussion, Dr. HENRY V. DICKS referred to Flugel's criteria of moral development—from the egocentric to the social, from the unconscious to the conscious, from autism to realism, from fear to security, from emotional to intellectual judgments, and so on. The triumph of the reality-ego over the superego helps to lessen unconscious guilt. Guilt is part of the natural social equipment of children, and development depends on the gradual internalisation rather than projection of guilt, and on the growth of reparation-guilt over persecutory guilt. For Western European children the introduction into the superego of "good" and "bad objects" takes place early, and it is important to know the ratio of love and hate in this ambivalence. Cultures which include a high proportion of bad objects must erect barriers for dealing with their effects. Collective guilt, in such cultures, would be a reaction to severe individual guilt. Germany before the war appeared to all observers to be more rigidly ordered than any other country and to insist more on good behaviour in children. The father figure was built up, and a high degree of conformity was required. But the picture became that of an adolescent revolt turning to the Nazi movement, with the leader as the father figure. Before the rise of Hitler, in the depression, gangs of delinquent boys were wandering the country in revolt against paternal authority. The revolt was, of course, most noteworthy when economic forces made paternal authority a failure. In fantasies of parricide the boy identifies himself with the sadistic aspect of the father, and the craving for tenderness is repressed. Now we are beginning to hear of such groups of wandering boys again in Germany protesting against the adult world which has betrayed them. It has been found by those who have tried to work with such groups that the hostility of the boys is roused if the worker refuses to fill the omnipotent father rôle. Dr. Dicks suggested that we need studies to assess the positive and negative aspects of collective guilt in maintaining world order, and the optimum balance between freedom and authority in bringing up children. We also need to know whether shame-cultures show a preponderance of introjected good or of bad objects, as compared with our own guilt-culture.

Group and Individual Therapy

Opening this discussion, Dr. C. A. MEIER (Switzerland) suggested that there are possible dangers in group psychotherapy through loss of personal contact and substitution of mass methods. Dr. W. B. TERHUNE (U.S.A.) described work on brief psychotherapy, which, he said, should be directed to getting the greatest effect in the shortest time, with the least possible suffering to the patient. The therapist needs an eclectic attitude but he must also know exactly what he wishes to achieve in each individual case. Brief psychotherapy uses abreaction to give the patient a working knowledge of his emotions; group psychotherapy, occupational therapy, and systematic aftercare are all essential.

Dr. W. R. BION described his recent experiences with group psychotherapy. He has been trying to evolve a technique in which the presence of a group is as essential for therapy as is the presence of the individual patient in individual psychotherapy. He uses the rapport between himself and the group as the basis of therapy by attempting to interpret the nature of this rapport to the group. Among the group are found attitudes of hostility, anxiety, confusion, and silence, all of which must be taken up with them. In order to handle the events in the group, Dr. Bion has hypothesised a "group mentality," which arises from each individual's struggle with his own difficulties in the group. This group mentality expresses itself through the "anonymous contributions" of each individual—i.e., the unconscious non-verbal expression of hostility and other repressed feelings. The existence of the group mentality presents a challenge to the satisfaction of each individual's personal needs; and the conflict thus aroused leads to what Dr. Bion calls the "group culture." These three elements are used in interpreting to the group what is going on. The group resists recognition of the tensions within it; and up to forty sessions are needed before they begin to understand the nature of the experience which they are undergoing. At this stage the patients begin to be aware of emotional phenomena in a new light.

Dr. DANIEL BLAIN (U.S.A.) reviewed the use of group psychotherapy in the United States. Increased experience of this form of treatment during the war has led to the conviction that it is important in its own right, and not just as a method for dealing with many patients at the same time. He described four main categories of treatment: (1) direct therapy, for the specific purpose of curing neurosis; (2) indirect therapy, for assisting other treatment (e.g., occupational therapy); (3) as an aid in the development of young people (e.g., camps); and (4) all other meetings in which individuals come together. He emphasised the importance of special training, particularly for therapists carrying out direct group psychotherapy.

In the discussion which followed, Dr. J. D. F (U.S.A.) described the use of analytic methods of therapy with neurotic and psychotic adults. Psy logists and psychiatric social workers are being used auxiliaries to the psychiatrists for research into gr methods. Mr. S. R. SLAVSON (U.S.A.) pointed out group therapy is based on the well-known principles transference, catharsis, insight, reality testing, sublimation. He emphasised the importance of sel patients with the same underlying dynamic distu Dr. RICKMAN held that group therapy is going the same phase now as did individual therapy 25 ago. The important thing is to ignore warnings of group therapy is not, and to seek to learn what therapy is. He suggested that the important feature between group and individual psychotherapy the taking up of the emotional experiences of the me particularly the relationship between patients therapist. With regard to brief psychotherapy, Rickman warned against attempts to avoid and difficulties for the patient; it is just these which have to be taken up if therapy is to succeed.

Public Health

Statistics for March Quarter

NEW low records for infant mortality, the ge death-rate, and deaths from influenza are recorde the first three months of this year by the Regi General for England and Wales.[1]

The provisional infant-mortality rate was 41 per related live births, the lowest for any first qu This is 11 below the figure for the same period a earlier, and 25 below the average for the March qua of the ten preceding years. (For the second quarte this year the provisional rate is 31, which is the lo rate for any quarter on record.)

Births totalled 202,184, representing a birth-rat 18·9 per 1000. This compares with 193,580 births a rate of 17·8 for the preceding quarter, and 21 births and a rate of 22·8 for the corresponding qu of 1947. The average birth-rate for the first quarte the five years 1942–1946 was 16·7.

The number of illegitimate births, included in total, was 11,055, or 5·5 % of the total births regist compared with 12,684, or 5·3 %, in the correspon quarter of 1947. The 5043 stillbirths registered r sented 24·3 per 1000 of the total live and still bi which was 1·3 lower than for the same period a year The stillbirth rate per 1000 total population was 0·

The number of deaths registered was 132,705, r senting a death-rate, based on the 1947 total popula of 12·4 per 1000—a new low record for any M quarter. It compares with 17·1 for the correspon quarter of 1947 and an average death-rate for the quarters of the five years 1942–46 of 14·3.

Deaths from acute poliomyelitis and polioenceph (provisional total excluding non-civilians) numbere compared with 24, 40, 429, and 196 in the four prec quarters.

SURVEY OF SICKNESS

An analysis of the latest returns of the Social Su of Sickness shows that in November, out of 2520 interviewed 1018 reported some illness or injury there were 931 consultations with doctors; ou 3138 women interviewed 2339 reported illness or in and there were 1615 consultations with doctors. Du the three months October, November, and Decem illness or injury of some kind during a month reported by 69·8 % of all persons interviewed; was an average loss of exactly one day a month each person interviewed. Among housewives illne injury was reported by 70·3 %, compared with the ger level of 69·8 %.

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1. Registrar-General's Return of Births, Deaths, and Mar in Quarter ended March 31, 1948. H.M. Stationery O Pp. 32. 1s.

Reconstruction

HOSPITAL REGIONALISATION

Three Categories of Specialist?

Most medical men expect that the National Health vice will remove from their professional life many ures which they have traditionally cherished. They ve, however, promised willing coöperation, and it is refore necessary to see what new features can be oduced to counterbalance the loss of the old. A com- hensive medical service is certainly one of these, and ugh it has been promised it will need great and tained effort from the whole of the medical profession ore it can be achieved.

Hospital regionalisation affects more particularly the sultants and specialists. It has already been accom- hed on paper, but much remains to be done before hoped-for benefits can be realised. This brilliant ception, properly carried out, will raise and maintain a high level the work of hospitals throughout the ntry. Every hospital staff will have a share in the demic and more specialised branches of the profession, ich previously were almost entirely the preserves of university teaching hospitals. These in their turn l gain a wider outlook from closer contact with duates from other schools, for there is no doubt that y have often been unnecessarily isolated and narrow, gely owing to a strong tendency to "inbreeding."

The ideal, difficult in any case to attain, may be mpletely lost unless measures are taken soon. There already signs that regionalisation will prove to be ne like "balkanisation," with the teaching hospitals erting their supremacy and patronage while the ellite hospitals form uneasy and grudging alliances ainst them. The fact that the teaching hospitals ve been placed in a separate compartment from the her hospitals within the region is an important factor the situation and from this point of view unfortunate. The first signs of conflict are already appearing with formation of regional consultant committees. The ching hospitals hold that their special position entitles em to a majority on these committees, while the her hospitals prefer the more democratic method of unting of heads, since they are superior in numbers.

What is needed? First, a revolutionary change in minds of most hospital medical staffs. Every con- tant knows that while most of his colleagues are dividually broad-minded and progressive, when grouped gether as a staff they tend to be parochial, narrow, d even jealous in their attitude towards other hospitals. is change of mind will be made easier by the group area medical committees taking over some of the nctions of the hospital medical committee, which ould lead to a wider outlook and loyalty; but the odwill of consultants of eminence and sufficient rength of character to withstand the disapproval of eir colleagues will be needed.

In our opinion the interchange of consultants is obably the most important single factor making for tegration throughout the region. Opportunities of eeting and working with a wide variety of colleagues ust be beneficial. This idea has been generally approved d even occasionally realised, but its realisation has been nited for economic reasons which should no longer apply.

Categories of Specialists.—We suggest that there should three main categories of specialist: (1) group or area;) regional; and (3) national. We recognise that ter shades of distinction could be devised, but these ould probably be unnecessarily complicated and vidious. The above classification is already largely in e and should not be difficult to apply.

1. *Group specialists*, the junior grade of consultant, should be given the opportunity of attending specially arranged resident courses at the larger hospitals, where they could meet and mix with their senior colleagues. They should also be offered the chance of working for short periods in supervised posts such as registrar's or first assistant's, either when the holder of the post is on holiday or by interchange.

2. *Regional specialists.*—This should be the basic appointment, and its holders should be men of sufficient standing in their specialty to be acceptable to every hospital in their region. Each group should have a number of regional specialists so that interchange within the region would be possible for all groups.

3. *National specialists* should be men of the highest clinical standing, acceptable to all regions throughout the country.

These categories of specialists might well be closely related to the awards recommended by the Spens Committee for outstanding ability. This part of the committee's report is the most controversial, though it is recognised that the encouragement of clinical ability is most desirable. Many people fear that the Spens awards to a third of the profession in consultant practice will to a large extent be confined to the big centres. In our scheme the awards would be widely scattered, and would do much to encourage and improve the skill available *at the peripheral hospitals.*

Method of Selection of Specialists.—In the first place men would be chosen in the various categories for their qualifications and experience, but later the regional specialists should have a large voice in the election to their ranks, for they would rapidly acquire a first-hand knowledge of the talent available. Their experience of the region would be such that they should have a large representation on all regional medical committees and this would do much to diminish any possible conflict between the teaching and other hospitals on this point.

If any group had not sufficient men of the regional status it should be possible to attract such men by the offer of the appropriate Spens award when making the appointment to the group. There might also be a lack of suitable specialists throughout a region and this could be adjusted in a similar manner. Occasionally a group might not offer enough scope for regional specialists and regrouping might be necessary.

Period and Method of Interchange.—We suggest that a minimum period of six weeks in every two years should serve as a basis for the interchange of specialists. A shorter period might be too short for any useful work or contacts and a longer one might sometimes cause difficulties. Some time before each period of interchange lists could be made, and a proportion of the interchanges, say 30–50%, should be made by drawing lots. Everyone should be subject to this, but after the required number had been drawn the remainder might be by arrangement. In these cases the minimum period of six weeks might sometimes be increased with advantage. The rarer specialties would of course need different treatment.

Advantages.—Such a scheme might do much to integrate and raise the level of service throughout the country. It would in no way impose restriction on the clinical work of recognised specialists and would enable their ability to be assessed by their colleagues at first hand and not only through their writings or other methods of publicity. The Spens awards would produce some benefit to the profession as well as to the individual, and would go to men who deserved them for their clinical ability, since new work or special skill would quickly bring invitations or nominations from other hospitals or regions. The awards would cease or be reduced as anyone became less acceptable or lost the desire for interchange. In our opinion this is as it should be, unless the awards are to become more like pensions than recognitions of particular professional competence.

B. R. Sworn, M.B. Lond., F.R.C.S.

Stafford. J. MacD. Holmes, M.D. Leeds, M.R.C.P.

Disabilities

11. ILEOSTOMY

PERHAPS I was lucky, but it did not take me long to get used to having an ileostomy. The operation was done when I was $17^{1}/_{2}$. At first I was too ill to take much interest in anything, and then, while getting strong again, I found that the novelty of the experience usually kept my spirits up. But there were occasional fits of utter depression, some of them, I must admit, deliberately brought on, probably to stir up sympathy. Later on, when I began to find that life was not to be nearly so curtailed as I had feared, the attacks of depression became less common, and now they are rare.

Some $3^{1}/_{2}$ months after the operation I was able to get about for at least $2^{1}/_{2}$ hours between one evacuation of the bowel and the next. At first it was hard to do this without using a catheter, but through a deliberate attempt to lengthen the interval the muscles eventually started to work properly, and I dispensed with the tube. Now, to secure evacuation, I sit down and gently massage the lower abdomen; and by tensing the muscles at the right moment—a trick soon picked up—I can discharge $^{1}/_{2}$–$^{3}/_{4}$ of a tumblerful at a time. If there is any difficulty through retained flatus, it can often be overcome by changing the position of the body—for example, by resting on one arm or lying on the back. When, after several minutes, nothing has happened, a good remedy is to replace the appliance and walk round the house for a while. At each sitting, which lasts about half an hour, I aim to get rid of a pint or more, but the amount varies with the intake of food and drink. It pays not to hurry over the job; otherwise one may be compelled to come home halfway through a picture or a dance.

This procedure is carried out four times a day—after breakfast, lunch, and tea, and before going to bed. By sticking to this time-table I can nearly always be sure that nothing disastrous will happen between times. When I wish to stay out longer than $2^{1}/_{2}$–3 hours, I am careful to finish my last meal at least 3 hours before leaving; in this way I can usually manage to stay away for up to 5 hours without any attention to the ileostomy. While not on a strict diet, I avoid certain foods, such as nuts and very highly seasoned dishes. When going out I do not take such foods as onions, herrings, peas, and beans, because of the smell or the flatulence which they cause; and I steer clear of most vegetables and of raw apples as they often take some "getting rid of."

I do my dressings in a separate room with a small table and a double-seated occasional chair; the only special piece of furniture is a cupboard. There is one round and one kidney-shaped enamel bowl, the first for excreta and the second for soiled dressings, which are later burnt in the closed kitchen stove. Between dressings everything is stored in the cupboard; this I try to keep as tightly closed as possible, for flies can be a nuisance, and when there are any about I spray the room with D.D.T. after each dressing.

Dressings take about 1 lb. of cotton-wool a week; and the cheaper varieties seem to be more absorbent than the more expensive. Sometimes I also use cellulose wadding, which is cheaper still. The skin around the ileostomy is usually kept healthy with zinc and castor-oil ointment; but if it does become inflamed the addition of some 'Dettol' ointment soon puts things to rights. To keep down the smell of any excreta which flow into the box between dressings, I put into it $1^{1}/_{2}$ dessertspoonfuls of powdered wood charcoal; this also thickens the excreta, thus preventing leakage.

For the actual dressing I first clean the skin with cellulose wadding, and then smear the ointment round the ileostomy over an area a little larger than that covered by the appliance. Over the ileostomy I place a piece of gauze with a hole in the middle, then a s shaped piece of cotton-wool. Next comes the and round the rim of the hole in it I also smear oint as a seal against the cotton-wool. Strips of cotton are applied round the bottom of the box and the nearest the hole; these are held in place by the s of the belt and a piece of 2 in. bandage looped at end and passed over the buckles of the belt and r the bottom of the box. This is rather a primitive ment, but it saves a lot of cotton-wool. This surro cotton-wool can be dispensed with if the box fits well; several times I have tried to do without cotton-wool round the ileostomy itself, but th friction the skin soon becomes sore, especially i box does not fit well. At the top of the daytime are three air-holes. At first, when I stooped for with the box partly filled, some of the contents w leak through these holes. To prevent this, I place the top a piece of cellulose wadding about 3 in. and long enough to be held in place by the straps o belt.

When going out for longer than 5 hours or so, I a satchel or small suitcase containing cotton- cellulose wadding, gauze cut to shape, a small bott charcoal powder, and another of zinc and cast ointment. It may be necessary to take a tin or receptacle for soiled dressings; and if this is use should be sprinkled with dettol to reduce the cham smell. With experience all these things can be pa into quite a small space.

The last dressing of the day is slightly different f the rest. I smear with ointment a patch of skin the size of the night box. and then apply g cotton-wool. The holes of this box I cover with a strip of cotton-wool, with one end held in place by belt and the other tucked under the edge of the As this piece is liable to become damp in the ni cellulose is unsatisfactory as a substitute. The ileost being on the right side, I always sleep on the left, the rubber bag of the night box across the body, so there is less chance of the appliance leaking. My pyj get slightly soiled about once or twice a week, real "disaster" necessitating clean sheets takes only about once a fortnight. Unfortunately, when laid up in bed with a cold the time-table soon astray, and control is lost; but this is quickly rig as soon as I get up and about again. Lately I w bed for some days after undergoing an operation on kidney. The ileostomy worked wonderfully by itsel

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I am extremely lucky to have youth on my I was fortunate, too, in not having previously got se into a job, which I might have had to give up readjustment has been less troublesome than it m have been. I have been able to find work which I do at home and which enables me to stick to the t table. If I get on well, I should be able to earn en to get married and to make a home of my own; having no-one but myself to see that I get on wit I have to urge myself to keep going, and I find all of excuses for laziness.

Naturally, I like a certain amount of female comp and, being shy and rather easily embarrassed, my bility has been the biggest hindrance here. To ca friends, of course, I don't mention it, but a girl finds out that I have been ill. One of the first quest seems to be "What is your job?"; this is followe "Where do you work?" and when I reply "At hor they invariably ask why. To casual friends I thin is enough to say that I have been ill, for this is l likely to embarrass each party. Girls, and for matter all my friends, have always been extrer understanding, rarely embarrassing me with expres of sympathy.

Often I baulk at making an arrangement in advance, n case, I suppose, anything should happen physically o prevent me carrying it out. Yet only about three or four times in 3 years has anything actually stopped me from fulfilling an engagement or made me hurry home in the middle of it. When I have to refuse an invitation to anything lasting more than 5 hours, my hief feeling is one of annoyance rather than of misery, and even this lasts only a few minutes. There are plenty of things I can do, including tennis, swimming, skating, ycling, driving a car—in fact, anything not too strenuous or long continued. In my rare fits of depression, I soon ealise that I can do more than many people who have been as ill as myself.

Obituary

JOSEPH CUNNING

M.B. MELB., F.R.C.S., F.R.A.C.S.

Mr. Joseph Cunning, formerly senior surgeon to the Royal Free Hospital, died at Reigate on July 29 at the age of 76.

Mr. Cunning was born in Australia, the son of James Erskine Cunning of Victoria, and he was educated at Ballarat and at Melbourne, where he graduated M.B. in 1894 with honours in medicine and surgery. He held house-appointments at Melbourne Hospital before coming to this country, where, after postgraduate study at St. Bartholomew's Hospital, he took his F.R.C.S. in 1901. In the same year he was appointed resident medical officer to the Royal Free Hospital, where four years later he joined the honorary staff. He was also a member of the staffs of the Victoria Hospital for Children and of the (then) Cancer Hospital.

Cunning kept up his ties with his native land, serving as president of the Australian and New Zealand Association of Medical Men in England, and in 1932 he was elected to the fellowship of the Royal Australasian College of Surgeons. He retired from the staff of the Royal Free in 1931 after an association with the hospital lasting thirty years. "During his 26 years on the active staff," writes L. E. C. N., "Cunning proved his worth as a surgeon of outstanding ability, especially in the field of abdominal surgery. His technique as an operator was superb, coupled with extreme gentleness in handling the tissues. He never appeared to hurry, but he wasted no time. His colleagues can testify to his skill and craftsmanship, and it was a pleasure and privilege to see him operate. He always had his patients' interests and welfare at heart, as witnessed by his kindly approach and readiness to listen to their story. A versatile teacher, Cunning had the power of imparting knowledge, and many students and residents have cause to recall with gratitude his inspiring ward rounds and clinics."

Mr. Cunning married Dr. Annie Thin, a student of the London School of Medicine for Women and a former director of the open-air school in Regent's Park. They had two sons and a daughter.

"...'Facts, and more facts!' cry the laboratory scientists, banging their fists with approval on the bench, and jolting some apparatus in course of construction. 'But what's their significance?' say the natural philosophers, looking up from their desks, leaving the mixture of doodles and speculations scribbled on the paper before them. And the two groups eye one another with suspicion and mistrust. Which camp you work in is a matter of temperament, and the sad truth is that so few are capable of work in both. Yet both are essential to the progress of science."—Dr. J. L. CRAMMER, *Science News*, 1948, 8, 7.

In England Now

A Running Commentary by Peripatetic Correspondents

IN the 8 months since they arrived in New Zealand 12 out of 24 girls given free passages as pupil nurses have left their hospital, and it has dawned on the authorities that they only came to the job for the sake of the free trip. But why else? If it was the training they wanted they could have got it at home. And now the old question is being asked, why do immigrants want to go home? Some say that the trouble here is that the government should not have imported spinsters in the same ship as a number of bachelors. Which is pretty obvious, but doesn't matter because the Dominion is the gainer anyway. But the Blimps with their old what's-happened-to-the-pioneering-spirit lament are back on their perch, and find plenty of cases to support their argument in men who should have been able to make a good thing of life in this country and didn't. But the pioneers did not have to wait four months for a land court to confirm their purchase of a holding, and they didn't have to pay sales tax on the planks milled from the trees they had felled themselves. Besides, I suspect that this adulation of the pioneers is a bit overdone. Life in England in the hungry '40s must have been so unpleasant that the back-blocks could hardly have been worse; and once they had rounded the Horn they were not likely to want to do it again. I bet they were just as homesick as we are, only the reaction is different. Some of us just go home. They had home sent to themselves. Unfortunately home meant gorse and sparrows; but though they have plenty to say about gorse and sparrows on other occasions the Blimps are apt to forget them in this particular discussion.

This business of adapting the immigrant to his new country is worthy of more attention than it has yet received. The Americans, as usual, did the thing thoroughly when they occupied England. Each soldier was given a booklet which explained the strange features of the country he was going to, films were shown and lectures given. The British Army did the same sort of thing for returned P.O.W.S. But the prospective settler has to find things out for himself, and it is scarcely to be wondered at if he sometimes comes down to his new earth with something of a bump. In my own case the only introduction was a spontaneously arranged "quiz" on board a few days from our destination, when the natives answered some of the immigrants' questions: and then it was too late to think again. Housing? It's tough. Clothes? All right for most things, but shirts are tough. Cars? They're tough. One came away convinced that most things were tough except the meat. An introductory course for intending emigrants a week or two before the boat sails is the answer, if there is one.

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How often must we have pictured just what we should do if we found ourselves in a completely non-austerity world. But should we really react by massive purchases, or is it just I who am a bit slow off the mark? I remember the first shop window display of hot-water bottles I had seen in England for years. "Good" I said to myself "We'll be able to get H.W.B.S again," and I left it at that and went home and told my wife. And when I went back to the shop the next day the H.W.B.S had all gone. It was three months later, in a town a hundred miles away, that I next saw one—and bought it.

I have lived in a land of milk and honey for eight months now, but my reluctance to buy anything remains as fixed as ever. I still can't bring myself to ask for more than would be thought a reasonable quantity for an Englishman on 1947 standards. "May I have a 5 lb. tin of honey, please?" One. I feel I could do with half a dozen. But what is even worse is going into a shop where I am not known. I expect to get a stony look and the usual remark about regular customers; but no, the shopkeeper actually wants to sell you something, and he doesn't care whether he has ever seen you before or not. I confessed these inhibitions to my wife and I was rather surprised when she said she experienced them herself. "I look at the dresses and the children's clothes" she said, "and I think 'that's just what Joan was looking for' or 'that would be the very thing for Mary,' but I can't do anything about it, and I don't seem to want to go in and get things for myself."

For ten years we have been pressed deeper and ever deeper into the mould of restricted domestic planning, and even if food returned in Beetonian quantities we should find it difficult not to make up our menus on two-pennyworth of corned beef. Fill the shops with unrationed consumer goods, and the public would goggle for a few hours at the piles of sheets and soap and tinned fish, and then they would turn back with relief to invest their money in the dogs or blue it on twopenny cigarettes (after all something would still have to be taxed). There may be fallacies about this economic utopia, but there's no doubt about the effects of prolonged restriction. I can fully understand now how it is that the greengrocer is back at the onion basket the day after he wins £30,000 at the pools. He just can't help it.

* * *

Out here in our West Indian colony we decided to buy a few hens, just enough to keep the household in eggs. The hospital's East Indian milkman was able to oblige, so I asked him to bring along three Rhode Island hens as a start. He looked shocked and lowered his eyes. "But mistress, you must get a cock also." I was new to the game, and unwilling to precipitate an argument on the sex life of hens; but something told me Mr. Lal was wrong. However, the servants supported him; so along came the hens accompanied by the cock, a fine young fellow with a burnished green tail and a prodigious appetite. The hens laid as disappointingly as hens always do, but we did get a small regular supply. In due course one of the senior members of the staff came to hear of the cock's existence. "Stuff and nonsense," he snorted, "quite unnecessary, kill the creature!" So, feeling a little bewildered, we killed and ate him, finding him by this time a little tough. There was consternation in the kitchen. Ambrosine wept at the prospect of no more eggs, and Nannie invoked the deity. "Mistress," she cried, "this do be flying in de face of de Lawd, who did order dat de animals go in two by two! Who are we to deprive de hens of dere rights and to risk our own salvation wid de Lawd?" Oddly enough, the next day there were no eggs, nor the day after, nor the day after that. Mr. Lal and the servants were triumphant; but I stuck rather shakily to my ground, and after exhaustive inquiries among my hen-keeping friends discovered that the cock's sudden end had coincided with the off season for eggs, and that *no-one* was getting any. I pointed this out to the servants, but they knew better. Time passed, and in due course our sex-starved hens began to produce bigger and better eggs than ever before. I had the good taste not to draw attention to this in the kitchen, but to slip the eggs into the fridge when the kitchen was empty.

* * *

How does the miller come by his golden thumb? I liked my fellow peripatetic's version (July 24), though it does not tally with folklore. "Miller's thumb" is a pleasantry very much akin to "Purgatory pickpurse." "Golden," from keeping it on his side of the scales when weighing, or so our proverbs have it. By their dozen they poke fun at this occupational trauma, as for instance: "It is good to be sure, quoth the miller, when he moultered (took the toll) twice." Chaucer, in the quotation given, goes one better than that, adding "yet" (=once again) and the terminal oath for good measure.

* * *

The instructor hit him three times on the head with a poker to demonstrate to a group of industrial medical officers that safety hats effectively protect the miner against head injury. Alas, the unfortunate tyro had not adjusted the inner lining of his hat; so its crown rested on his thin aristocratic cranium. He blinked at the first blow, swayed at the second, and paled visibly at the final stroke. Any way, these medical officers will never forget that the safety hat protects only if it is worn properly.

Letters to the Editor

THE PATIENT AT HOME

SIR,—Your leading article last week admirably described the plight of the doctor who would serve in the new scheme to the limit of his capacity and who is popular enough to attract the maximum of 4000 patients. Unless he can afford an assistant he may well be dissatisfied with his prospects, for medicine must now seem to him an endless succession of packed surgeries.

Few doctors would gladly undertake to work under such unfavourable conditions, and if they did they would not be running a health service. A surgery full of people who have come to be patched up after a fashion strikes me as a good example of what one might call a disease service—not unlike witchcraft, if one considers that the doctor must help some 30 people an hour without knowing anything about them beyond the part selected for show by the patient. Surely the medical mind is not so disease-ridden that it will accept this as the proper way to care for the nation?

If we are to use the new scheme as it is meant to be used we must aim at reinstating the family doctor—in full strength and with a will to practise health. This means shifting the interest from the casual visitor in surgery to the patient and his family at home. It takes time, and it could be done, as you suggest, by reducing the present maximum to 2000 on a higher capitation fee; but it could also be done by giving doctors with full lists paid assistants. By this expedient, similar to the scheme advocated in the first Spen's Report, newly qualified men would be given excellent training opportunities, while doctors who have proved their worth to the public would be able to widen rather than restrict their sphere of influence. The good family doctor has qualities which cannot be exploited in the treatment of warts or ingrowing toe-nails; he is a specialist in handling human beings, and he will be most useful when he can handle as many as possible in his own way. He is altogether too valuable a member of the community to be wasted, and it seems a pity to cut down his list instead of giving him better opportunities to use his particular gifts. Love of work, among other things, makes him what he is; but will it survive the crowded surgeries which pressure of circumstances threatens to force on him? We may assume that he will put up a fight against circumstances, and you are right in asking that he should be helped. The family doctor you describe is the family doctor we want; but the position which he should occupy in a household can never be achieved through contacts in surgery. Patients who hesitate to avail themselves of the N.H.S. because it would mean attending surgeries show that they appreciate this.

These patients may not know precisely what they would miss, but it is something they value pretty highly and something that should be available to them. It is not the professional skill of a medical man, but the influence on the family as a whole of someone who knows them well enough to identify himself with their interests and to guide them accordingly. The patients know, and the doctor knows, that he can learn more about a family in one visit than in months of attendances at surgery; they only need to be assured of his interest in them to give him all the confidence he needs; but it is hard to show the right kind of interest during a short consultation in surgery. It is extremely easy to enlist the coöperation of a household during a leisurely visit, and the doctor who combines this with his knowledge and the patients' trust becomes a social institution of the first importance. He can be the trained ally of common sense and right thinking in all matters pertaining to family life and welfare, and an educative force in a sphere all his own. The more he knows of his patients, the more inclined they are to trust him and to be guided by him—indeed, they ask for nothing better. Once he does occupy this position in a household, he is the tower of strength, the guardian of health, the hope of the stricken, and a whole lot else.

What is less obvious (although you mention it) is that he is also the person who can make the specialist's service really useful to the patient. The specialist is no more inclined to cast a decisive vote on the evidence of a single examination than th[illegible]ht to be; no is he inclined to exert himself in a case where he is not particularly needed. The family doctor is supremely well qualified to know when and where a specialist's services will be most useful, and he is the only person who can provide the information which the specialist will need if he is to give a worth-while opinion.

But the whole machinery breaks down (or rather. fails to come into being) if the doctor's attitude is that of withholding himself from his patients, shunning contacts unless they are actually thrust on him, and generally leaving the patient in a position where he has to do all the asking. Nobody can feel cared-for under such conditions, and the asking goes on, to the discomfort of both doctor and patient. One can do more good by saying " I'd like to come and see you "—even if it is only to hand over the 4-weekly disablement certificate—than one can with gallons of mixtures; and if one happens to mean what one says, one is also a much happier person. The patient will immediately reply " Oh, please don't bother, doctor," will be overjoyed if the doctor takes no notice of this, and will be a pleasure to treat ever after. Such patients do not call one out in the night without very good reason, nor do they trouble one with requests for bottles. The doctor who "suffers" from his patients has only himself to thank for it, and I am afraid he is going to suffer horribly if he allows restrictions and conditions to be imposed on anyone who wants to consult him—particularly with private patients who remember him as all eagerness to help.

An enormous proportion of " illnesses " are the expression of some form of maladjustment or misery. The doctor cannot reckon to know anything about them until he knows the patient's background, and he should take the first opportunity to study this, once aware that trouble is afoot.

Many people take up general practice because nowhere else can similar opportunities for coöperative effort be found, and nowhere else can the good doctor be so useful to the community. His chief usefulness does not lie in his ability to diagnose and treat disease; people are not unhappy because they are ill: on the contrary, they relax; they accept the full status of invalid with some relief because their claim to the care and attention which they needed all along has at last been established without wounding their amour-propre. The people who are less happy are the patient's relatives, and they welcome help and support all the more for not having a proper claim to them.

Least happy of all are the people who can find absolutely no excuse or reason for feeling as wretched as they do; they turn up hopefully in the surgery with a " heart " and go away dejected, having been told that air-swallowing has given them a wholly pointless discomfort and that they are perfectly fit for work. They should not be allowed to remain dejected, and they can be helped—not indeed by bolstering up their hopes that the heart may yet give out and entitle them to a little more consideration, but by being allowed to talk and to enlist the friendly understanding of at least one person. Their chief trouble is that no-one ever has listened to them, and this tends to make them aggressive as well as despairing. They do not approach the doctor as a friend, they have ceased to expect friendship; they hope for a magician who will unearth the mysterious trouble and apply the correct remedy—preferably by a complicated form of treatment with an even more complicated name. These are the people who throng the surgeries, ever hopeful that the bottle will do its stuff in the end, or that the doctor will come to understand " my case " well enough to suggest something more helpful. The exact symptoms are a matter of chance, and are recorded out of politeness; one knows that if the headache is cured something else will be the bother next time. One's job is to get at the source of this nagging desire for attention and magic formulæ, and a good way of doing it is to find out what the patient is running away from in coming to the surgery. The answer is in the patient's home and in the patient's past. If one gets to know the home and the past, one can begin to see how oneself might respond in the patient's circumstances; a few pointers as to the personality should help to complete the picture and present patient and symptoms as the perfectly credible result of his or her environment (which, incidentally, is often quite incredible).

If this seems an awful lot of trouble to a doubtful end, let it be said that the patient will have begun to benefit by the attention from the moment one showed oneself ready to listen, and that his or her family will have benefited equally. An unhappy member is usually a great trial to the family and unhappiness is apt to spread. The doctor will have benefited in a number of ways, one of them being the satisfaction of having given genuine help to a genuine case, instead of placebos to imaginary ailments—which I think is what makes doctors so dissatisfied with their eternal prescription-writing in surgery.

Bagshot. S. GRAHAM.

APPARENT ACUTE GLOMERULONEPHRITIS WITHOUT ALBUMINURIA

SIR,—There seems no reason to doubt the diagnosis in the interesting case reported by Dr. Crofton and Dr. Truelove in your issue of July 10, though there must remain a little uncertainty about the complete absence of albuminuria throughout the course of what was evidently a fairly severe attack of acute glomerulonephritis. Slight and transient albuminuria is notoriously elusive even when sought " at least once daily." For this reason I would venture to suggest that the case might have been more appropriately called " acute glomerulonephritis apparently without albuminuria." Even so the author's paper is a valuable contribution to the literature on the subject.

Unequivocal examples of analbuminuric glomerulonephritis have rarely been reported, as the authors note. I cannot recall having met with an undoubted instance myself, though on a number of occasions I have seen patients suffering from marked and unmistakable signs of acute glomerulonephritis in whom albuminuria was minimal or transient throughout, and I have three such under observation at present.

The pre-albuminuric stage of glomerulonephritis, on the other hand, is not so rarely encountered if carefully looked for in the interval between the causal infection and frank signs of renal disease. It has been most often recorded in postscarlatinal nephritis, probably because the latent interval referred to is most easily observed in this disease.

Any or all of the major signs and symptoms of acute glomerulonephritis—i.e., hypertension, œdema, azotæmia, and microscopic hæmaturia—may precede albuminuria by some days. To the references in the literature on pre-albuminuric signs of glomerulonephritis quoted by the authors might be added a paper by Brasiello,[1] who mentions hypertension, hyperchloræmia, and azotæmia as preceding albuminuria in postscarlatinal nephritis.

Less conspicuous pre-albuminuric signs that have been reported in postscarlatinal nephritis are an increase in the usual leucocytosis in scarlet fever,[2] and disappearance of the alkaline tide.[3] Of pre-albuminuric signs of acute glomerulonephritis, œdema, as apparently in the authors' case (puffiness of the eyes noted, significantly, sixteen days after a sore throat), would seem to be the most common, its appearance and degree being to some extent determined by the constitution and previous habits of the patient. For example, it was found [4] that dropsy was recorded as the presenting or most conspicuous symptom in 67%, and hæmaturia without marked œdema in 16·5% of all cases of acute nephritis admitted to Guy's Hospital in 1887–88. Forty years later, in 1927–28, the corresponding figures were 24% and 40%.

Hawes and Vardy [5] comment upon the prevalence of " nephrosis " and nephrotic nephritis in China, and I am informed that in some parts of India glomerulonephritis in the form of " the large white man with the large white kidney " is still more often seen than it now is in this country.

Barlow,[6] Goodhart,[7] and Taylor [8] all refer to œdema as the most characteristic and marked feature of

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1. Brasiello, E. *Policlinico*, 1929, 36, 41.
2. Bowie, J. M. *J. Path. Bact.* 1903, 8, 82.
3. Osman, A. A., Close, H. G., Carter, H. *Guy's Hosp. Rep.* 1933, 83, 360.
4. Osman, A. A. *Ibid*, 1936, 86, 93.
5. Hawes, R. B., Vardy, E.C. *Quart. J. Med.* 1935, 4, 1.
6. Barlow, G. H. *Guy's Hosp. Rep.* 1840, 5, 167.
7. Goodhart, J. F. *Ibid.* 1879, 39, 153.
8. Taylor, F. Practice of Medicine, 3rd ed. London, 1893; p. 729.

scarlatinal nephritis, though it is now a comparatively rare manifestation of the disease in western countries. A hundred years ago, indeed, the terms scarlatinal dropsy and scarlatinal nephritis were used synonymously. Sometimes there was no albuminuria, at other times the dropsy preceded, accompanied, or followed albuminuria in a most puzzling manner[9] reminiscent of the kriegsœdema during 1914-18; Dr. Hahn referred to this in your issue of July 17.

The time of appearance and degree of œdema as a symptom of acute glomerulonephritis would therefore seem to be in part related to the nutritional state of the patient and the community in which the disease occurs, though doubtless it is more marked when albuminuria is excessive and prolonged. Incidentally, œdema not infrequently precedes albuminuria in another renal disorder—pre-eclampsia. It would then seem to be more obviously an exaggeration of a pre-existing state of waterlogging that normally occurs in pregnancy.[10]

Renal Unit, County Hospital, Pembury. A. A. OSMAN.

M.R.C.P. EXAMINATION

SIR,—The letter of Aug. 7 from "M.R.C.P." is very timely, for never has the subject of the Membership examination been so commonly discussed. Before the war only a fortunate few aspired to become specialists and consultants; but now that the average entry is 600, and the trend towards specialisation in every branch has increased immeasurably, the whole subject of "specialist" examinations has become one of the utmost importance to a large proportion of the younger part of the profession.

"M.R.C.P." rightly emphasises that in an examination designed to test clinical ability the hazardous factor known as "luck" should be minimised by every means available. I do not think the most hardened examiner would deny that this factor is a very prominent one, especially when the whole bedside approach of the candidate has to be assessed on the results of one "long" and one "short" case. A well-known ex-censor is reported to have said that he could as easily fail a candidate on a straightforward mitral stenosis as on the most obscure neurological disorder. This can be readily understood; but a candidate who has made a diagnosis with ease and assurance on a case which he has diagnosed from the ward door can stand up to an examiner's questioning with confidence and courage: whereas another, at the next bed, faced with an uncoöperative and often misleading patient, and little wiser at the end of half an hour, is psychologically in no condition to handle a possibly truculent and browbeating examiner.

The only fair method would be to increase the number of cases and length of time allocated to the clinical portion, to read *always* what the candidate has written in the papers, and to allow him to proceed on an aggregate of marks. The numbers taking the examination at present may preclude such a lengthy test, but by no means other than the institution of a primary examination could they be thinned out. Possibly the writing of a clinical report and of a three-hour essay might act as a deterrent to all those who take the examination "on spec," and there are many such.

Other aspects of the unfairness of the examination as at present constituted spring immediately to mind. Are not many who consistently fail acknowledged to be better men than those who pass? And how many now eminent physicians had multiple attempts? How many acknowledge that they were no better when they finally passed than at their first attempt! One concludes therefore that there is about this examination considerably more than the usual element of luck.

Another point which comes to mind is the question of the significance of the examination. Is it merely to be an index of fitness to undergo specialist training, or is it rather an attestation that the candidate has completed such a course and is fit to undertake the responsibilities of specialist practice? There is far from uniform opinion on this matter. It would appear that ideally no-one should be allowed to present themselves until they have completed a lengthy period of resident appointments at recognised hospitals. The Royal College of Surgeons demands such a period (but even that is far too short), and the Royal College of Physicians would do well to consider whether a minimal period of, say, three years (or possibly even five) might not be demanded from an aspirant to its membership. The Americans, unhampered by centuries of tradition, have succeeded in laying down along these lines regulations for their specialist boards which appear to ensure a far more *rigid* selection of suitable men and women, and a far better training of those selected.

It is only by this means that the title of M.R.C.P. can possibly have any value as a designation of real specialist status; and thus only will it cease to be merely a key to admission to certain house-appointments, registrarships, and the like.

WOULD-BE-MEMBER.

SIR,—"M.R.C.P." says that the clinical examination should be preceded by "stiff papers" for the purpose of weeding out the weaker candidates. Surely it is the aim of the censors' board to admit to the membership only those with *an accurate and reliable clinical* knowledge; and, as everyone knows, those who write the best papers are not necessarily the best doctors. If there were several searching clinical examinations, perhaps "M.R.C.P.'s" plea for fairness would be satisfied.

Aberdeen. ELMA M. SIMPSON.

VITAMIN E IN COLLAGENOSES

SIR,—I was interested to read Dr. Burgess's article (Aug. 7) in which he referred to his success in treating fixed types of lupus erythematosus with mixed tocopherols (vitamin-E complex), the more so as his results seem to have been so very much happier than ours have been at St. Thomas's Hospital.

Last November, Dr. G. B. Dowling asked me to investigate the effect of vitamin E in lupus erythematosus, and I began to treat a series of such cases with synthetic α-tocopherol, beginning with a dose of 100 mg. daily and working up, in the absence of any favourable response, to a maximum of 300 mg. daily. Synthetic α-tocopherol was chosen as the only form of vitamin E available in this country in sufficient quantity and concentration to be practical for such a trial.

Altogether 22 cases were treated, all for at least ten weeks and 16 for more than four months. They were mostly cases of many years' standing, 11 having been going on for more than ten years, 5 for between five and ten years, and only 1 for less than two years. All except 4 had previously been treated unsuccessfully with one or more of the common gold, bismuth, or arsenic compounds; and all were thoroughly examined for any other evidence of disease, and seemed otherwise perfectly fit. Several had had real or suspected septic foci dealt with in the past, and 6 had, at some time in the course of their affliction, cleared completely, only to relapse later. The α-tocopherol was given by mouth, and no patient was considered to have failed to respond unless he had received not less than 200 mg. daily for two months; most cases had 250–300 mg. for a longer period. No single case cleared, or even improved dramatically, under the treatment; 4 showed some slight improvement, 11 remained quite unchanged, and 7 became worse in that their lesions became more extensive or new lesions appeared while the patient was taking the α-tocopherol. Of these 7, 1 was at first thought to be showing definite improvement. We had no controls, but at this point I should mention the case of a patient who was referred back to her own doctor with the suggestion that she should be given vitamin E. Six weeks later she returned to us with every trace of her lupus erythematosus gone, but, alas, the letter she brought with her informed us that her doctor had been unable to obtain any vitamin E, and so had continued treating her with calamine lotion as before.

As a result of this trial, we came to the conclusion that α-tocopherol was without value in the treatment of lupus erythematosus. Furthermore, this trial was begun in the late autumn and carried on throughout the winter and early spring, a time of year when a number of cases of lupus erythematosus show spontaneous improvement

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[9] *Lancet*, 1844, ii, 298.

[10] Osman, A. A., Close, H. G. *Quart. J. Med.* 1930, 23, 393. Dexter, L., Weiss, S. Pre-eclamptic and Eclamptic Toxæmia of Pregnancy. Boston, 1941; p. 20.

It will be interesting to see the more detailed report[1] on this work, to which Burgess referred; but should this be confirmed it will be apparent, in the light of the trial that I have briefly described, that the part of the vitamin-E complex responsible for its good effect in fixed types of lupus erythematosus must be some other than the α-tocopherol, unless of course the synthetic product differs in some subtle way from that occurring in nature. At first sight our doses appear rather smaller than Burgess's, but he does not state the percentages of the various individual tocopherols in his "mixture," and even if half were made up of the α-tocopherol, it will be seen that, as we gave this in its pure state, our doses in terms of the α component were more than equal to his. Therefore, had this substance been an active therapeutic agent in lupus erythematosus, our results would have paralleled those of Burgess, instead of proving a sorry failure.

St. Thomas's Hospital,
London, S.E.1.

R. D. SWEET
Assistant, Skin Department.

BEDS FOR PULMONARY TUBERCULOSIS

SIR,—I should like to endorse the excellent points made by Dr. Tattersall in your issue of Aug. 7 and to add a few remarks of my own.

The choice of cases for the few beds available to the chest physician is a difficult and responsible task, but I have no hesitation in giving preference to the young case in the early treatable stages. To fill these beds with chronic or more advanced cases of doubtful treatability for months on end while the same bed could be used to accommodate, in succession, a number of young persons with early disease, seems to me both illogical and inhuman. The plea that the more advanced case is more infectious and should therefore be isolated is short-sighted. With waiting-lists of six to nine months many of the early cases, thus debarred early admission and rapid sputum conversion, will be equally infectious (and probably more mobile) before they are admitted.

The continued progress of surgical technique is offering more and more of the advanced cases major collapse therapy, with the inevitable result that the average length of stay in sanatoria is steadily rising just at a time when the mortality from pulmonary tuberculosis is also on the upgrade. It is perhaps partly due to this trend in surgery that the death-rate from tubercle is rising, for while sanatorium beds are thus blocked with "doubtful risks" those awaiting admission are steadily advancing to become hopeless cases.

The time has come when very serious consideration should be given to the bed situation for tuberculous patients. The reason so often given for the present position is the shortage of nurses, but I feel that there is now a danger of this becoming a facile excuse for inaction. It has already been suggested by Dr. Bentley[2] that much can be done to relieve the position by reorientating our views on tuberculous nursing without seriously affecting our standards of treatment.

It is far more important, in my view, to review the whole tuberculosis problem in the light of its importance to the community as the disease which kills more of our young, productively useful citizens than any other single factor. This disease should be tackled with priority on a nation-wide scale. We find, however, that it is far easier to admit to hospital the patient with acute pneumonia (whose illness can be reduced with sulphamerazine to a three-day fever), or the one with cardiac failure (whose essential treatment is rest), or carcinoma (who has retired from useful life) than ever it is to obtain urgent adhesion section or phrenic crush for the young girl of 19 years with very early cavitating tubercle and the most productive years of life before her. The obvious answer is the immediate reallocation of existing beds on a basis commensurate with the importance of the diseases they are to serve. The available nursing power would thus be fairly and most usefully employed. The nationalisation of hospitals has made this practicable.

In fact, however, there are signs that the new scheme may worsen the position. The keeping of a central waiting-list for sanatoria—the common practice of health authorities—has always been cumbersome illogical when dealing with disease. Admission shoul be determined by chronological order of diagnosis by clinical and social urgency. The only person knows all the facts is the chest physician in charge c case and it is he, therefore, who should determine order of admission of his cases and not a purely ad strative officer at a central office. Under the new reg boards the central waiting-lists are even longer more cumbersome and remote from the patient, f most instances a number of health authorities fall w one region.

Apart from the reallocation of beds, what ther we to do in the present impasse? Decentralis of the waiting-list with allocation of certain beds to clinic would greatly ease the situation. The physician of the area could then keep his own wai list and arrange admission according to the urg As Dr. Tattersall remarks, close collaboration bet chest physician and superintendent is necessary, it should be much easier under these circumstances no central authority intervening.

An even more satisfactory scheme would be fo chest-clinic staff to take direct charge of the maj of beds for the area so that continuity of treatment a satisfactory integration of domiciliary, short- hospital, and long-term sanatorium treatment attained. Many cases that are now kept in sanato for an unnecessarily long time would certainly not if the physician concerned were also responsible fo waiting-list.

Finally, I would point out that in general far too is done for urgent cases while they are waiting m for sanatorium admission. If more collapse the were undertaken in the patient's own home, with the few beds available in the local hospital used fo associated adhesion section and phrenic-crush o tions, many patients would eventually not need torium admission or at least their stay woul shortened. I am certain that we need many more trained and qualified men to undertake such wo chest clinics. The status of the tuberculosis office long unsatisfactory, should be raised; he shoul offered a specialist salary and provided with beds. then will the work attract men of specialist status an attack on tubercle begin to be really successful.

Hammersmith Chest Clinic,
Postgraduate Medical School of London.

PETER STRADLI

PREVENTION OF VENEREAL DISEASE

SIR,—Your correspondent, Dr. Forgan, in his l in your issue of July 24, misses the essential poin Lord Horder's letter published the previous week.

The campaign of the N.S.P.V.D. is directed tow the enlightenment of the public on the following poi

1. That over a long period of years the fact that v. easily preventable has been *prevented* from reaching public, and that in spite of lavish public expenditur other methods, V.D. has increased.

2. That impartial investigation by the Governn appointed Trevethin Committee settled, *once for all*, scientific fact that V.D. can be easily prevented. witnesses before that committee, including myself, prod overwhelming evidence of the dramatic reduction in that follows the introduction of self-disinfection. On subject of practicability the Trevethin report says: " *see no reason to doubt that an intelligent man, if furni with reasonable instructions, could in favourable condi effectively disinfect himself.*" The procedure is so si that any "official skilled supervision" of the disinfecti obviously superfluous. Practical experience, moreover, shown conclusively that civilians will not seek such assist and that *in the case of the Services the introductio supervision, and the elaboration of the procedure, have* the chief causes of the apparent lack of success, on acc of evasion. Officially supervised disinfection never has and never will be, successful on account of the psycholo factors involved.

3. That, incredible as it may seem, it is actually il *for a chemist to sell to any customer the necessary mate for prevention accompanied by instructions for use*

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[1] Burgess, J. F., Pritchard, J. E. *Arch. Derm. Syph. Chicago* (in the press).

[2] Bentley, F. J. *Lancet*, 1948, i, 722.

continues in spite of the fact that the Trevethin report, in 1923, recommended that the law should be altered.

Dr. Forgan says that he has advocated prevention for many years "as a means of reducing the incidence of V.D." Then why does he disparage the idea now? If practical prevention is allowed to be known generally, it will go on reducing the incidence until elimination is reached. At present not 1% of the population know anything about it, and those who do cannot use their knowledge on account of the legal obstacle.

The N.S.P.V.D. takes no part in the controversy about compulsory notification and compulsory treatment of V.D. All such suggestions are unnecessary because V.D. is easily preventable and its successful prevention is being prevented.

R. A. LYSTER

47, Nottingham Place, London, W.1.

Chairman, National Society for the Prevention of Venereal Disease.

SIR,—Lord Horder's letter outlining the policy of the National Society for the Prevention of Venereal Disease will be welcomed by many medical men who have to deal directly with this problem. As port health officer, with experience of a number of ports in the tropics, I have always made a point of asking merchant seamen suffering from venereal disease what precautions, if any, they took. *I have been appalled by the high proportion* of men who did not know how to protect themselves and by the number who thought that a condom was sufficient protection. As M.O., before the war, to a group of trading concerns in the Far East, I interviewed each new arrival and, after stressing the moral aspect, instructed him in simple methods of prophylaxis. The striking reduction in the incidence of venereal disease among the staff was ample compensation for the open disapproval of those *who said that immorality was being encouraged.*

P.H.O.

MEDICAL RECORDS

SIR,—Those who are aware of the conditions which now prevail in the majority of hospitals cannot but be *sympathetic towards "Medical Secretary."* Undoubtedly there is truth in some of the comments she makes in her letter of Aug. 14.

She and others may feel encouraged to learn that the Association of Medical Records Officers has under consideration an educational scheme whereby it would be possible to gain additional knowledge of anatomy, physiology, and medical terminology. It is recognised that no medical secretary or stenographer can really do justice to the tasks assigned to her without such a training. The association's first responsibility is, however, *to augment the knowledge of the officers in charge of* hospital medical records departments, and through them try to improve *the standard of medical record keeping*—in so far as the laity can improve the standard. Records officers agree that medical secretaries are key people in the production and maintenance of medical records, and, as a result of the active—and long overdue—interest which has been shown in this sphere of hospital administration in the last year or two, I think they may look *forward to a much greater appreciation of the value of* their work, and to more satisfactory conditions of service, in the not too distant future.

ELSIE ROYLE,
Honorary Secretary,

Manchester.

Association of Medical Records Officers.

SIR,—"Medical Secretary" is, regrettably, correct in her statements. The qualifications and qualities outlined by her are essential for all who follow the profession of medical record keeping, which includes medical stenography whether in hospital or in private practice.

It was because of the universally acknowledged lack of training facilities for those engaged in this work in hospitals and allied organisations that an Association of Medical Records Officers was recently formed. This *association aims at raising the standard of work done,* by training courses and opportunities for the interchange of knowledge and experience for those already engaged in the work, and by laying down fundamental standards of education for those entering the profession. These requirements correspond with those of other ancillary medical services, and *it is hoped thereby to gain recog*nition of the fact that the members of this association are specialists in *their own sphere.* So far as the grapher in private practice is concerned, no doubt *interested would be welcomed in classes arranged* members of medical records departments in as was the case in my own hospital, where pai secretaries attended a course of lectures on records and subsequently a course of lectures on anat and physiology, though naturally they would not able to qualify for membership of the association.

The association also lays stress on the careful of staff—a necessity too often neglected in the past *those responsible for appointments.* The results h sometimes been unfortunate, but the misguided selec has usually been due to (1) lack of appreciation of the technicalities and responsibilities of those employed in the medical records department; and (2) the small salaries *paid in comparison with commerce and industry,* where considerably less strain and responsibility have to be borne by the stenographer. Most of the people who work in the medical records department, and in some *cases in private practice too, do so because of their love* of the work, its absorbing nature, and their desire to serve their fellow men.

RECORDS OFFICER.

OCCLUSIVE DRESSINGS

SIR,—If Bull, Squire, and Topley (Aug. 7) have done nothing more than re-emphasise the deleterious effects of adhesive plaster and such-like occlusive dressings on the skin and on wounds in general, they have done a great service. It is commonplace experience that wounds do better when covered simply—a piece of gauze held in place by two narrow strips of strapping suffices for most wounds. I have never ceased to demonstrate this to my subordinates in peace and in war.

However laudable your contributors' effort to find *a substance which will allow normal skin evaporation* to take place without being permeable to outside fluids, we must be careful, now that the age of adhesive plaster is over, to ensure that our wounds never again have coverings with similar disadvantages.

Dublin.

MARTIN FALLON.

DEATH WHILE BATHING

SIR,—*It would be interesting to know* whether some unexpected deaths while bathing might not be due to *acute prolapse of a vertebral disc.* About a year ago in my bath I was suddenly, as it seemed, cut nearly in *two by something from behind.* For ten minutes I lay in that bath paralysed and nearly fainting with pain. *Had this happened while bathing alone* in deep wat I should certainly have died.

I suggest that pathologists confronted with such cas might look and see, if there is no other obvious cause, before attributing death vaguely to cramp, heart-failure, full stomach, and the like; also, that patients subject to such attacks be warned to be careful where they bathe.

Bristol.

G. L. ALEXANDER.

CHARMS

SIR,—Dr. Lowy has written a charming and disarming letter (Aug. 7); but if he is serious, isn't he being mo than a little naïve? There is, he tells us, in the hum *personality "the deep-rooted desire for the belief in* t supernatural and unexplainable." We may deplo it but we *cannot afford to ignore* it, and "if we wish be sincere" we must admit that in some people approach on these lines *promises better* and speedi results than the employment of scientific methods.

Dr. Lowy does not say so, but *it is self-evident* th this deep-rooted desire for the supernatural an unexplainable must run counter to all advances knowledge—advances which, of course, make the general body of scientific truth less supernatural and mo explainable. Is Dr. Lowy implying that such super natural and unexplainable methods of therapy should be encouraged in physical medicine as well (he will know that cures of organic diseases have been claimed by healers), or that while purely scientific investigation and treatment should be allowed to continue in general medicine, surgery, and other subjects there sh be an honourable place for atavism and supersti in psychological medicine? It would be interesting to learn how far Dr. Lowy would go in his encouragement of the supernatural and unexplainable. Would he, for instance, agree to the treatment of a patient by teaching and instruction which he knew to be false because he believed (or felt) that it might improve the patient's symptoms? Would he acquiesce in the treatment of a patient by a ceremony designed to drive out evil spirits?

I cannot think that any verification is needed at this stage of the fact that when people become more educated and enlightened they give up these earlier beliefs in superstition and the unexplainable. The unexplainable becomes then simply a problem to be explained. These beliefs, when they remain, are an impediment to free and accurate thinking; and when they are encouraged, in children particularly, it is at the expense of the exercise of their intelligence.

But the major proposition in Dr. Lowy's argument needs further elucidation. When he speaks of the "deep-rooted desire for the belief in the supernatural and unexplainable," is he implying the existence of a direct instinctive basis for these beliefs—something in the nature of an instinct of superstition or a "metaphysical" instinct? If the beliefs are not instinctive but cultural, developed in the early years of life, is it not then a case of error and bias distorting the growing personality? And would not the sincere (Dr. Lowy's word) therapist consider it to be his duty to try to eradicate them? Or does Dr. Lowy just prefer to remain a little obscure on this point and leave it as one of his unexplainables?

I was under the impression that there had been a halt in the retreat from reason since the war. Hitler's régime in Germany was surely atavistic enough and "metaphysical" enough to show us the dangers of this attitude. For Dr. Lowy's consideration and guidance I feel I should end with a quotation from the "Grammar of Science" by Karl Pearson. It was written over 50 years ago but still apparently requires to be emphasised.

> "It is the want of impersonal judgment, of scientific method, and of accurate insight into facts, a want largely due to a non-scientific training, which renders clear thinking so rare, and random and irresponsible judgments so common, in the mass of our citizens today. Yet these citizens, owing to the growth of democracy, have graver problems to settle than probably any which have confronted their forefathers since the days of the Revolution."

London, W.1. **FREDERICK DILLON.**

SIR,—Dr. Dillon (July 24) is right; we cannot be too careful with the tender minds of children, even if we do leave colleagues in their fifties to lie in the pit of suggestibility they so often dig for others.

My own indiscretions may possibly be excused as the too enthusiastic exuberant irresponsibilities of a callow middle age newly introduced thirty years ago to the mystery of the Unconscious according to Freud. Like Adam and Eve, I thought that the nipple and knowledge grew on the same tree, and, like them, was punished; for I speedily developed an uncharming, if not altogether unpleasant, twitching of the lips whenever the subject of nipple-like excrescences was introduced. Dr. Dillon's letter caused a particularly bad attack by evoking the picture of the thousands—to put it mildly—of supernumerary nipples in the shape of 8 oz. bottles to be handed out that very day to unsuspecting victims all over the world.

Never did Nemesis fit the penalty to the crime more appropriately. The spell was broken; the gift of animistic wizardry was lost; and for a generation the moon has rolled on unperturbed by the Dick Bartonish adventures of grubby little urchins seeking relief from ugly growths which, if my fan-mail is to be trusted, still defy the skill of a highly scientific profession. Frustrated, I turned to an investigation of the common stye, with strange results.

A response to Dr. Atkin's appeal (July 24) from a lunacy centre may show that this neglect of the influence of the moon is unjustified. My own further contribution, subject to the Editor's permission, will illustrate an apparent-monthly malevolence.

Portsmouth. **W. S. INMAN.**

STUDENT NURSES' SALARIES

SIR,—Traditionally nurses have become qualified by the apprenticeship system, according to which the young worker in return for his labour receives remuneration partly in money or kind and partly in the form of instruction in the mysteries of his craft. The system is susceptible to much abuse and in the past probationer nurses have been subjected to a high degree of exploitation, but it has many innate advantages which make its retention desirable especially as the defects can probably be removed by regulation.

Systematic theoretical teaching is necessary for student nurses, but the poise and maturity of the trained nurse are gained by doing things and carrying responsibility in the wards and other departments of the hospital and not in the class-room. Even the Americans now seem to have given up the attempt to train nurses by lectures and correspondence classes—at any rate, advertisements for courses of this kind have not been prominent recently. The rawness of the newly qualified doctor compared with the trained nurse is sometimes noticeable and the necessity for medical students to learn by doing is admitted by the Goodenough Committee, which recommends that in the new curriculum the medical student shall spend at least twelve months as a junior house-officer in an approved hospital before admission to the Medical Register.

It is important to consider what the nursing apprentice (if the Royal College of Nursing will allow me to use the term) receives during her course and what it is that she gives in return. Leaving aside all imponderable considerations she receives during her first year the following:

Salary £70.

Full residential emoluments, including food with the extra rations allowed by the Ministry of Food, laundry, indoor uniform, including a cloak or cape but not shoes, stockings, or underclothing. This is nominally valued for superannuation purposes at £75, and is not subject to income-tax.

Two months' free tuition as a boarder at a preliminary training school, during which time she receives full salary.

One month's holiday with pay.

The use of a nursing library and free paper and other writing material.

Travelling expenses on first coming to the hospital, but not when going on holiday.

A rations allowance of £1 per week when on her holiday.

Full pay during illness for periods varying with the length of service, with payment of rations allowance if absent from the hospital.

Under the National Health Service Act she, like other members of the community, is entitled to medicinal drugs, but drugs of addiction like alcohol and nicotine are regarded as part of her private affairs.

After passing from the preliminary training school she continues to receive systematic teaching from the sister tutors in addition to the practical instruction given by the ward sisters, doctors, and other members of the hospital staff. At the end of a year she has received the foundations of the training which will fit her for a profession in which she is sure of making a living and in which she will have many opportunities of entering on a distinguished career suited to any special abilities which she may possess.

The main charges on her income are:

National Insurance payment 3*s.* 10*d.* per week, or £9 19*s.* 4*d.* per annum. (The employer's contribution under National Insurance is 3*s.* 3*d.* per week or £8 9*s.* per annum.)

Textbooks—she will probably wish to have some books of her own to supplement those in the nursing library.

Superannuation deductions at 6% on the value of her salary and emoluments, amounting to 14*s.* 6*d.* per month or £8 14*s.* per annum. The opportunity to qualify for a pension is a privilege which many other hospital workers would like to share, and in any case the student can claim the return of her contributions with interest if she should desire to do so on leaving the service.

The considerations given by the student in return are as follows:

Labour for 39 weeks of nominally 48 hours. The working hours are reduced by the time spent in lectures. The time spent in this way varies from 2 hours to 4–5 hours per week. Lectures are taken during working hours if this can possibly be arranged.

The figures for the later years of training need not be given here, but it should be pointed out that they are perhaps less favourable to the student.

In spite of the efforts of the Rushcliffe Committee conditions in all hospitals are not quite the same.

The problem before us seems to be to decide what is the fair and just income for a woman of 18 of this mixed status—partly a student and partly a worker—having regard to the present volume of national production. If consideration is to be given to the social and educational background we must remember that these vary very widely in the social group.

Nurses in the past have submitted to gross injustice without much protest and without being very critical of what they were told by those who benefited from their exploitation. Conditions have now changed and we find various people promising student nurses rewards which might be appropriate in a very wealthy country but would be difficult to justify here. We cannot expect the nurses to be better critics of the new leaders than they were of the old.

Perhaps the solution will have to wait for the introduction of a national wages and salaries policy, but any comprehensive scheme of this kind might disturb a great many things, including the Spens Report.

HENRY H. MACWILLIAM
Walton Hospital, Liverpool. Medical Superintendent.

TYPHUS IN NORTHERN IRELAND

SIR,—I am directed by the Minister for Health to refer to the note under this heading in your issue of July 31, in the course of which it is stated that the family of two cases of typhus reported in Northern Ireland had frequent contacts with nomad gypsy and tinker bands from the west of Ireland "where typhus is still endemic," and to inform you that no case of typhus has been reported from the west of Ireland or from any other part of Eire since 1944.

P. A. KENNEDY
Secretary.
Department of Health, Custom House, Dublin.

A TAX ON KNOWLEDGE

SIR,—Your leading article of July 10 and the ensuing correspondence has caused quite a stir among us Government medical officers. It appears that the law is against us, and it may take a long time before it will be amended. In the meantime, the following remedy has been suggested and is being seriously considered.

As law-abiding citizens we shall obey the law even if it is a bad one. Accordingly, we shall not make use in our medical work of any progress made in medicine since we obtained our professional qualifications and since we ended our postgraduate training, by virtue of which we hold our present appointments. Excepted will be such information on new developments as is given by official pamphlets, publications, training courses, or congresses which we have attended officially.

In my own case and that of eight of my colleagues, we are not to know anything of penicillin and its uses, of most of the sulpha drugs, of streptomycin, of hormonal implants (e.g., in Addison's disease), of protamine-zinc and of globin insulin, of the use of methyl thiouracil for the treatment of toxic goitre, of modern methods of rehabilitation, of electroconvulsant therapy in mental diseases, of the surgery of prolapsed intervertebral disc, of modern heart surgery, of prefrontal leucotomy, of the medical or surgical treatment of myasthenia gravis, and so on *ad infinitum.*

Mr. Justice Rowlatt and the Commissioners of the Inland Revenue may rest assured, we will uphold their decision and respect their laws!

GOVERNMENT MEDICAL OFFICER.

THE medical faculty of Bolyai University, which was established for Rumanian citizens of Hungarian origin, is anxious to obtain copies of THE LANCET. Any reader willing to share his copy with the faculty should write to Prof. Joh. Musonyi, Bolyai University, Târgu-Mureş, Rumania.

Notes and News

RESEARCH IN EIRE

IN 1947 the Eire Government accepted a scheme for B. vaccination, and by the end of this year work will be under way. The scheme is sponsored by the Medical Rese Council of Ireland, whose report[1] describes a variety investigations. Attempts to find a chemotherapeutic a for tuberculosis continue and in animal experiments sev compounds of succinic acid have been proved ineffecti Derivatives of diphenyl ether and related substances h been synthesised and tested in vitro against mycobacter and at least one shows inhibiting power at dilutions gre than one in a million. During the year 510 strains of *My bacterium* tuberculosis isolated from pulmonary cases we typed and all were found to belong to the human typ Bigger's suggestion that combined penicillin and sulph*thiazole* might cure typhoid carriers aroused much hope, but further tests on 10 carriers have shown that in only 2 was *Salmonella* eliminated. After total doses of 100 g of sulphathiazole and 57 million units of penicillin 1 out of 4 carriers became positive eight weeks later while 3 possible cures are still being examined. On the medical side, administration of urea to normal human subjects has been found to cause a decrease in the stomach's response to histamine, and the effect of 'Enterogastrone' in the treatment of pept ulcer is also being studied. A further survey of rickets in the spring of 1947 showed that 82 per 1000 of all children between the ages of 3 months and four years were affected. For children between one and four years old the incidence is about half the figure for the last two years.

MODERN APOTHECARIES

IN this century the collaboration of doctors, laboratory workers, and pharmacists in the study and preparation of complex drugs has grown steadily closer and more rewarding At the recent B.M.A. meeting in Cambridge Mr. B. J. Thomas, of Allen & Hanburys, planned on behalf of the Pharmaceutical Society, and set up, in the pathology department of the Cambridge Medical School, an exhibition which well illustrated the importance of this bond. Pharmacopœias dating from 1618 to the new 1948 *B.P.* were a fascinating, though not perhaps a very original, type of exhibit. More instructive was the section showing the stages travelled from crude drug to active principle. Curare, sticky and brown in an earthern pot, or stored in a bamboo cane or a gourd, appears, after the pharmacist's assault, as tubocurarine chloride, a sterile standardised solution for injection. Buckwheat, as a source of rutin, and *Claviceps purpurea* growing on rye, as a source of ergot, suffer a similar process of purification, a the drug emerges like a soul from purgatory without a sta on its character. Some practical demonstrations of penicill assay, new emulsifying agents, and chromatography a fluorescence used to test and isolate drugs were arresting, but the demonstration which aroused most interest was an apparatus to measure the effect of anti-histamine substances on the isolated ileum of the guineapig. A neat physiological method of this kind always gives pleasure because it implies good and delicate technique. The exhibition showed well how fortunate our profession has always been in its colleagues among the pharmacists.

SERVICE RATIONS

A GOOD deal of information was collected during the w about the suitability and adequacy of various rations for t Armed Forces. Most of this work was done in the U.S.A. a Canada, and a summary of the findings has now be written by Dr. R. E. Johnson and Dr. Robert Kark who were concerned in many of the tests.

Their report[2] describes both experimental tests of rations and surveys of rations as consumed in the American and Canadian Forces from 1941 to 1946. Many of the findings were incorporated, though somewhat belatedly, in newer scales of rations. Most of them have an application to the field of nutrition far wider than is suggested by the relatively special groups studied. For example, the importance of calories, rather than of specific nutrients, showed itself in many of the studies. If the intake of calories was below the uirements, physical and mental disturbances arose which ged from irritability to gross deterioration involving austion and collapse, and, depending on the extent of the kiency, occurred in a few weeks or in one or two days. order to avoid calorie deficiency, it was necessary that the d should be not only adequate but also acceptable. Foods t were unusual in taste, appearance, or texture, or were lly prepared, were usually not acceptable, even though s meant that the total intake was inadequate. To allow differences in individual needs, standard rations should ply more than the average needs. Special conditions ulted in special problems, such as the need for adequate l easily obtainable water-supplies in the Arctic, mobile chens to prepare hot palatable meals for armoured units, l sufficient water and salt in the desert. One interesting ervation was that troops in the most diverse climatic ditions consumed very similar proportions of proteins, l that there was no increase in the intake of fat under tic conditions.

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[1] Annual Report of the Medical Research Council of Ireland, 1947.

[2] Published by the Quartermaster Food and Container Institute for the Armed Forces Research and Development Branch Office of the Quartermaster General, Chicago, 9, Illinois.

his report will be of considerable interest to all nutrition-, but its value would have been still greater if the rations, ribed by their official names such as B, C, K, or 10 in 1, l been given in more detail.

SPURIOUS STREPTOMYCIN

n Italy fraudulent dealers in streptomycin have been racting the drug from its containers and substituting cose, sodium bicarbonate, boric acid, or lactose. Others re labelled penicillin as streptomycin. A way of testing ubstance said to be streptomycin is given by Scanga ed in *Brux.-méd.* 1948, 28, 1624): the alleged streptomycin dded to an anaerobic broth-culture of *Bact. coli* containing thylene-blue; streptomycin inhibits the growth of *Bact.* , allowing the colour of the dye to reappear, and a decision l be come to within three hours.

RADIATION HAZARDS

A MEMORANDUM [1] prepared by the Association of Scientific rkers for the Labour Research Department, describes in ple words the types of radiations encountered in atomic-rgy and other plants, the results of their action on the nan body, and how the hazards may arise industrially. e style is perforce dogmatic, and one may forgive simplified tements except possibly: "It is fortunately not the e that any exposure to radiation, no matter how small, produce a harmful effect." In the present state of wledge, this statement is not justified: it would have n better to say that, within the present daily permissible es of radiation, adverse effects are insignificant. Also her unhappy is the remark that "a seven-hour, five-day k without overtime should be in force, and not less than weeks' annual leave is desirable for all who are unavoidably osed to intensive radiation." No worker will be exposed intensive radiation, and those exposed within the daily missible levels should need no hazard pay nor conditions ferential to other industrial workers.

RAT AND BIRD'S NEST IN AIRCRAFT

HITHERTO not much attention has been paid to the infesta-n of aircraft by rats. It was thought that rats would be ghtened by the noise of the engines and leave the aircraft the first opportunity. But a rat has lived for a month an aircraft, during which time it has put in 250 flying-urs and reached a height of 16,000 ft. The aircraft was out to take off from Saigon, it is reported,[2] when it was nd that some electric flex was cut. Sabotage was suspected, damage was repaired, and the aircraft was flown to Orly. the next trip similar damage was found, but this time the r had been bared in a spot hardly accessible to a saboteur. rat was therefore suspected, and an unsuccessful hunt was de for it at Karachi. Some fæces were found; so the t took care to leave, on the rest of the voyage, enough d lying about to make it unnecessary for the rat to gnaw . On the aircraft's return to Orly no success was obtained h poison put down for the rat. So it was decided to fly aircraft at a height of 26,000 ft. in the hope that the rat uld perish from anoxæmia; but, evidence being brought ward that rats might survive at this height, the project abandoned, and the rat was eventually caught in a trap.

In this same aircraft one of the ventilation trunks was found to be blocked by an Indomalasian starling's nest built of twigs and containing one egg. No attempt was made to hatch the egg, because it was slightly cracked and had been taken to a height of 16,000 ft.

THE JEWELLER IN BED

DIVERSIONAL occupations for patients are apt to become rather monotonous—raffia work, rug-making, belt-plaiting, painting, soft-toy making, and embroidery being the leading cults. The addition of another small skill may be welcome to patients who have wearied of the others or who never liked the look of them. At a conference last May, arranged by the Worshipful Company of Goldsmiths, and attended by representatives of the Association of Occupational Therapists, the Royal College of Nursing, the British Council for Rehabilitation, and the principals of schools of occupational therapy, it was agreed that simple jewellery and metal work might well be undertaken by long-term patients in hospitals. Mr. G. E. Gardam, PH.D., pointed out that not much skill and only simple tools are needed: and pleasant results can be achieved by people who have not done this kind of work before. Men, he thought, would prefer a craft of this kind to needlework and rug-making. Base metals such as brass, copper, aluminium, and pewter, in the form of thin softened sheets, and wire, can be used; and soft soldering can be done, by means of an electric soldering iron, without much mess. Miss B. de Foubert, a teacher of occupational therapy who had formerly been a jeweller, noted that the making of jewellery calls for initiative and imagination, qualities latent in many people, and often roused, to give great satisfaction, during a long period of convalescence. Dr. Gardam suggested that the Goldsmiths' Company might help by arranging short courses for instructors, or arranging for an instructor to tour the orthopædic hospitals and train occupational therapists. They might also issue short instructive pamphlets, showing how each article was to be made—rather on the lines of a knitting pattern. Moreover, instructors would be able to turn to them for advice on sources of tools and materials.

Mr. Claud Geoffroy de Chaume, a designer craftsman who demonstrated to the meeting, has since been given a grant by the Goldsmiths' Company to enable him to arrange demonstrations to occupational therapists, so as to show them the possibilities and limits of the craft.

University of Cambridge

On Aug. 7 the following degrees were conferred:

M.D.—E. R. Hargreaves, R. T. Hastings-Jones, R. B. Heisch, *David Verel, *F. A. Whitlock, R. R. Wilson, H. I. Winner.

M.B., *B.Chir.*—*P. H. Abbott, *Anthony Ackroyd, *Philip Allebone, *V. E. Amassian, J. C. Barker, *J. R. Bennett, *D. G. Bonham, *I. W. Broomhead, D. S. Craig, *E. J. Dowling, W. J. D. Eberlie, *C. P. E. Elliott-Binns, *D. V. G. Feltham, Paul Fehrsen, *J. E. Forster, *I. W. de G. Gregory, Ian Henderson, C. Q. Henriques, F. N. Hicks, P. J. Higgins, *J. L. Hine, *Michael Honey, *D. G. Julian, *E. A. Kauffman, *Norman Kennedy, *W. M. Keynes, H. G. L. Lloyd-Thomas, *J. A. MacDougall, A. A. McInnes, *John Mancler, P. F. D. Naylor, *G. W. Page, *C. M. B. Pare, *Harry Piggott, *Stanley Powell, *R. A. Robinson, *J. E. S. Scott, *R. T. Sears, *P. G. Seed, *Leo Sefton, *J. G. H. Shaw, *J. M. L. Shearer, C. C. K. Smith, *G. S. Smith, *E. F. Soothill, *W. F. W. Southwood, R. A. Stanger, *D. I. Storey, *D. B. Sugden, *C. H. Talbot, *R. G. O. Tayler, *K. R. Wallace, *W. R. Walsh, *D. B. J. Wardle, *H. I. Williams, *R. D. Williams, *J. D. Whitby, *G. E. W. Wolstenholme, *A. R. H. Worssam.

* By proxy.

University of Glasgow

Dr. T. Ferguson Rodger has been appointed to the newly founded chair of psychological medicine.

Dr. Rodger graduated B.SC. at the University of Glasgow in 1927 and took his M.B. with commendation two years later. After holding a house-appointment at the Falkirk and District Infirmary he spent some time in Baltimore as an assistant in psychiatry at the Johns Hopkins University. On his return to Scotland he became assistant physician at the Edinburgh Royal Mental Hospital. He returned to Glasgow as assistant to the lecturer in psychiatry at the university, and later became senior assistant physician at the Glasgow Royal Mental Hospital and assistant consultant in psychiatry at the Western Infirmary. He also acted as hon. secretary to the Scottish Child Guidance Council. During the late war he served with the R.A.M.C., and with the rank of brigadier he was consulting psychiatrist at H.Q. Land Forces, South-East Asia, and at General H.Q., India. Dr. Rodger is now a commissioner of the Scottish Board of Control. His published work includes papers on night-blindness and personnel selection. He obtained the D.P.M. in 1931 and the F.R.C.P.E. last year.

Edinburgh Post-Graduate Board for Medicine

On Friday, Aug. 27, at 3.30 P.M., in the anatomy theatre of Edinburgh University, Prof. Alexander Haddow will lecture on the Present State of Chemotherapy in Cancer.

The Protection of Workers from Radiation Hazards in atomic energy plants and other establishments using radioactive substances. Pp. 21. 1s. From the association, 2, Soho Square, London, W.1.

Tanon, Boyer, Tourret, *Bull. Acad. Méd. Paris*, 1948, 132, 420.

University of London

The appointment of Dr. T. Crawford and Dr. D. V. Davies to the chairs of pathology at St. George's and of anatomy at St. Thomas's was announced last week.

Dr. Crawford is a graduate in medicine and science of the University of Glasgow, where he qualified in 1935. In 1938 he was awarded the Hall tutorial and research fellowship in pædiatrics there, and he also held a house-appointment at the Royal Hospital for Sick Children. Later he was appointed assistant pathologist to the Royal Infirmary and lecturer in pathology in the university. During the late war he served with the R.A.M.C. with the rank of major, as a specialist in pathology. In 1941 he was awarded the Bellahouston gold medal for his M.D. thesis. Since 1946 he has been director of pathological services at St. George's. His published work includes papers on carbohydrate tolerance in hypothyroidism and hyperthyroidism and on the causation of the low blood-sugar curve in cœliac disease.

Dr. Davies, who is a fellow of St. John's College, Cambridge, qualified from University College Hospital in 1935 and took his M.B. Lond. the same year. After holding house-appointments at U.C.H. he became demonstrator in anatomy, and later lecturer, in the University of Cambridge. In 1945 he was an Arris and Gale lecturer at the Royal College of Surgeons. He is an examiner in anatomy for the Conjoint Board and for the University of Cambridge, and since 1944 he has been college lecturer in anatomy at St. John's. His published work has been chiefly concerned with the synovial membrane and fluid.

Mr. R. T. Williams, D.SC. has been appointed to the university chair of biochemistry at St. Mary's Hospital medical school.

Royal College of Obstetricians and Gynæcologists

On Friday, Oct. 1, at 2.15 P.M., Dr. Emil Novak, associate in gynæcology at Johns Hopkins Medical School, Baltimore, will give a lecture on Certain Functioning Tumours of the Ovary. On the following day, Oct. 2, at 10 A.M., Dr. N. W. Philpott, professor of obstetrics and gynæcology in McGill University, Montreal, will deliver the William Blair Bell lecture. He is to speak on Rhesus Factor Iso-immunisation and Hæmolytic Disease of the Newborn. Tickets for both lectures may be had from the secretary of the college, 58, Queen Anne Street, London, W.1.

Dentists in the Health Service

The Ministry of Health announce that up to Aug. 7, out of an estimated total of 10,000 dentists in general practice, 6654 had entered the National Health Service.

Rockefeller Travelling Fellowships in Medicine

The Medical Research Council have awarded the following Rockefeller fellowships for 1948–49:

Dr. K. W. DONALD, medical professorial unit, St. Bartholomew's Hospital, London.

Dr. L. P. R. FOURMAN, Nuffield department of clinical medicine, University of Oxford.

Dr. R. H. GIRDWOOD, department of medicine, University of Edinburgh.

Dr. A. ISAACS, department of medicine, University of Sheffield.

Mr. A. I. S. MACPHERSON, department of surgery, University of Edinburgh.

Dr. H. B. STONER, department of pathology, University of Sheffield.

Mr. S. F. TAYLOR, department of surgery, Postgraduate Medical School of London.

British Rorschach Forum

At a recent meeting convened by Dr. C. J. C. Earl, the original forum, which had been an informal group and never properly constituted because of war conditions and other difficulties, was dissolved and reconstituted. The objects of the new forum are to facilitate the exchange of views among those using the test, to safeguard professional standards in the use of the method, and to encourage research among Rorschach workers. The officers of the forum are Dr. Earl (chairman), Miss Theodora Alcock (secretary), Dr. W. Mons (treasurer). Further information may be had from the secretary, c/o the Tavistock Clinic, 2, Beaumont Street, London, W.1.

Courses for Public-health Nurses

The National Health Service Act offers increased opportunities for health education by public-health nurses, and the Central Council for Health Education is, therefore, providing a two-day course of lectures for health visitors, midwives, district nurses, and school nurses on this aspect of their work in the following university centres: Birmingham, Sept. 13–14; Bristol, Nov. 1–2; Cambridge, Oct. 18–19; Cardiff, Oct. 25–26; Leeds, Oct. 4–5; Liverpool, Sept. 20–21; Manchester, Sept. 23–24; Newcastle, Oct. 14–15; Oxford, Oct. 11–12; Sheffield, Oct. 7–8; Courses are also being arranged in Belfast, London, Middlesex, Essex, Kent, and Surrey. Particulars can be had from the medical adviser and secretary of the council, Tavistock House, Tavistock Square, London, W.C.1.

Westminster Medical School

Mr. W. T. S. Stallybrass, D.C.L., vice-chancellor of University of Oxford, will deliver the inaugural add this school, 17, Horseferry Road, S.W.1, on Monday, O at 3 P.M.

British Standards

A new standard (B.S. 1443), published by the B Standards Institution, specifies the size of X-ray film intensifying screens, together with internal sizes of ca adopted for future use. The committee charged with work has found it possible to provide satisfactorily f uses with a range of 10 inch-sizes and 6 metric-sizes; 16 sizes will replace more than 30 formerly in use. has been taken to ensure that films and screens of the standard sizes will be capable of use in all existing equip

The institution's Hospital Equipment Standards Adv Committee, formed at the beginning of 1947, has an account of its work up to date. This report (P.D. price 6*d.*) is obtainable from the institution, 24, Vi Street, London, S.W.1.

Sir Hugh Cairns, Nuffield professor of surgery at O has left for South Africa, where, as Arthur Sims trav professor he is to lecture at Johannesburg, Durban, Cape Town.

Appointments

BECK, DIANA, M.B. Lond., F.R.C.S., F.R.C.S.E.: neurosur Middlesex Hospital, London.

TAYLOR, L. R. S., B.A., M.B. Camb., F.R.C.S.: chief assistant to nose, and throat department, St. Thomas's Hospital, L

Colonial Service:

- BEARBLOCK, ARTHUR, F.R.C.S., D.T.M. & H.: superscale medical and health officer, grade B, Federation of Malaya
- BLAND, R. H., O.B.E., M.D. Dubl., M.R.C.P.I.: senior leprosy officer, Nigeria.
- COOPER, S. W., F.R.C.S.E., D.T.M. & H.: surgeon specialist, Gold Coast.
- DEGAZON, D. W. A., M.B. Lond., F.R.C.S.E., D.O.M.S.: M.O. (specialist), Jamaica.
- EVANS, W. G., M.B., B.SC. Wales: superscale medical and health officer, grade B, Federation of Malaya.
- FARQUHARSON, A. D. J., M.R.C.S.: M.O., Nigeria.
- HOLMES, W. E., M.A., M.B. Dubl., D.P.H., D.T.M. & H.: super medical and health officer, grade B, Federation of Mala
- JACKSON, P. F., M.B., B.SC.: M.O., Uganda.
- KERR, N., M.B. Edin.: M.O., Bahamas.
- LOVETT, W. C. D., M.D., B.SC. Wales, C.P.H.: M.O., B Somaliland.
- LOWE, G. H., M.B. Leeds, D.P.H.: superscale medical and officer, grade B, Federation of Malaya.
- MCGREGOR, J. S., M.D., M.SC. Edin., F.R.C.S.E., D.T.M & surgeon specialist, Gold Coast.
- MOODIE, A. S., M.B. Glasg., D.P.H.: M.O., Hong Kong.
- PORTER, G. E. J., M.R.C.S.: M.O., Gambia.
- RAINSFORD, C. R. C., M.D. Belf., D.T.M.: senior M.O., Uganda.
- ROBERTS, F. R., L.R.C.P.E.: M.O., Gold Coast.
- RUSSELL, BEATRICE, M.D. Edin., F.R.C.P.E., D.T.M. & H.: ph specialist, Gold Coast.
- STRUTHERS, E. A., M.B. St. And., D.P.H., D.T.M. & H.: de director of medical services, Federation of Malaya.
- SUGAR, MAX, M.D., F.R.C.S.E.: M.O. (specialist), Jamaica.
- SWORD, J. M., M.B. Glasg.: M.O., Nyasaland.

Births, Marriages, and Deaths

BIRTHS

BINKS.—On Aug. 1, at Chadderton, to Dr. Margaret Binks, wife of Dr. Paul Binks—a son.

FRASER.—On Aug. 8, at North Bovey, Devon, the wife of D D. B. Fraser—a son.

GLASS.—On Aug. 9, in London, to Dr. Norma MacLeod, wife of Dr. R. M. Glass—a daughter.

HODGE.—On Aug. 11, at Bridgwater, Somerset, the wife of D Gerard Hodge—a son.

KENNEDY.—On Aug. 8, in London, the wife of Dr. Gordon Ken —a daughter.

PRAGNELL.—On Aug. 5, the wife of Dr. C. A. Pragnell—a so

TODD.—On Aug. 11, at Guildford, the wife of Dr. J. W. Todd—a

MARRIAGES

FREW—HAWTREY.—On Aug. 7, at Aldershot, Thomas Pat Frew, M.B., to Caryll Courtenay Hawtrey.

OPPÉ—BUTCHER.—On Aug. 5, at Orpington, Thomas Ernest O M.R.C.P., to Margaret Mary Butcher.

DEATHS

ARNOLD.—On Aug. 6, at Worthing, Miles Bracewell A M.D. Manc., D.P.H.

MAITLAND.—On Aug. 10, Thomas Gwynne Maitland, M.A., B B.SC., D.PHIL., Edin.

SUTHERLAND.—On Aug. 14, in Edinburgh, Francis Suther M.B. Edin., D.P.H.

HE SELECTION OF MEDICAL STUDENTS

A. D. HARRIS
M.R.C.S.

rom the Medical Research Council Unit for Research in Applied Psychology, Psychological Laboratory, Cambridge

IN 1869 Paget wrote a short paper called "What ecomes of Medical Students," taking his title from a tory told of Abernethy, who entering the anatomy heatre for one of his introductory lectures "looked ound at the crowd and exclaimed, as if with painful oubt, 'God help you all! What will become of you?'" n trying to answer this question, Paget and two of his olleagues drew on personal knowledge of 1000 students ney were able to trace out of 1226 who had passed rough their hands between 1839 and 1859. Of this 000 they estimated that 23 achieved distinguished ccess, 66 considerable success, 507 fair success, 124 ery limited success, and 56 failed entirely. Also epresented in the 1000 were 96 who left the profession, 7 who died within twelve years of starting practice, nd 41 who died during pupillage.

Galton (1889), who used Paget's figures to exemplify ertain characteristics of frequency distributions, indicated uccinctly the range of talent found in this group of octors:

> "In the present case it appears that towards the foremost of the successful men within 15 years of taking their degrees stood the three Professors of Anatomy at Oxford, Cambridge, and Edinburgh; that towards the bottom of the failures lay two men who committed suicide under circumstances of great disgrace, and lowest of all Palmer, the Rugeley murderer, who was hanged."

alton further comments that in this paper Paget thus did for St. Bartholomew's Hospital what has ever been done, so far as I am aware, for any university r public school, whose historians count the successes nd are silent as to the failures, giving to inquirers o adequate data for ascertaining the real value of those nstitutions in English education."

Eighty years after Paget wrote, the case is little etter, though discussion in recent years on the selection f students has given us fresh cause to inquire "what ecomes of medical students."

The problems involved in selecting medical students ave been admirably discussed by Smyth (1946). Briefly, he number of applicants for admission to medical chools has risen greatly and shows no sign of falling gain. The ratio of applicants to available places varies or different medical schools between 20 to 1 and $2^{1}/_{2}$ to 1. It had been anticipated that an increase would occur after the war—the so-called "post-war bulge"—but it is clear that something more has happened. A further reason for the increase is the better financial provision for students by means of grants and scholarships. This applies equally in all faculties of the universities; but it is in the medical faculties that congestion is most extreme. It seems that there has been a definite shift n preference towards medicine. Besides the problems reated by the increase in number of applicants there as for some time been uneasiness about the quality f some of those accepted. It has been felt that perhaps aluable recruits were being turned away, and it was een that some of those who were taken later proved unsuitable.

Before the war it was usual for candidates to be nterviewed by the dean or his representative. The nterviews were generally perfunctory but served to xclude those whose unsuitability was conspicuous. In ome schools it was found that even this brief encounter ould be dispensed with, and candidates were accepted n school record or headmaster's recommendation. As he number of applicants began to rise, one medical school after another found it necessary to introduce more stringent methods and to spread more widely the labour and responsibility involved. Most of them relied on improved interviewing systems, in which several members of the teaching staff constituted either a selection board, the members sitting together, or a panel of interviewers each of whom saw a proportion of the candidates. More detailed forms of application were introduced, and attempts were made to reduce the numbers for interview by preliminary exclusion on the basis of the information thus provided. In at least two English medical schools a written examination has been used as a "sieve" for the same purpose.

METHODS OF SELECTION

It was natural to inquire whether any help could be expected from the experience of those faced with similar problems in industry and the Armed Forces. The answers given have not been entirely satisfactory. Perhaps the question has been put in terms too general; certainly this has been true of the replies. What are called "selection methods" or "psychological methods of selection" have been advocated or rejected as if they constituted a uniform type of procedure, different in kind from the ordinary methods of choice between rival candidates. It is clear that selection is exercised whenever the number of candidates exceeds the number of places for which they are competing, and presumably the term "selection methods" comprehends any of the ways in which this can be done. It would further be questionable whether the adjective "psychological" can legitimately be withheld from any method which includes at least an interview. The misnomers would not be important if the meanings were generally agreed. However, this is not so. These blanket terms are used to cover any procedure ranging from a single pencil-and-paper test to a week-end at Stoke d'Abernon; and this naturally leads to a certain imprecision of judgment. Thus it has been suggested that the "W.O.S.B. technique" should be used for selecting medical students, though there is no very obvious connexion between those features of W.O.S.B. which appear to be new or distinctive, namely techniques for assessing leadership, and the qualities required of a medical student.

The term "selection methods" is used here in its common sense to mean any method whatever by which a choice is made between candidates. It does not appear useful to class together all the newer methods by calling them "psychological" or anything else. Particular techniques—e.g., interviews, intelligence tests, projection tests, interest questionnaires, &c., are best treated separately. Eysenck (1947) has given a valuable review of several specific techniques in relation to examination success in university students. It would be useful if a similar account could be given, by those with first-hand experience of Service methods, of those particular techniques which might be thought relevant.

THE INTERVIEW

The interview is the most important instrument of selection in use today. It is as unlikely that any development in testing practice will supersede it as that laboratory aids to diagnosis will supersede the clinical examination of patients.

At many medical schools the board interview has been adopted as a means of ensuring that the fate of candidates is not decided by the bias of a single interviewer. Two things must strike anyone who has watched these board interviews taking place. The first is the formidable difficulties that the boards must contend with. Time is very short; often less than five minutes, rarely more than ten, can be given to any candidate. The candidates are nervous and "unnatural"; sometimes they may be thrown right off their balance by an injudicious opening question or by the number and eminence of their audience. Most of all one is struck by the paucity of information available to the board; continually they are in the position of the clinician asked to make a diagnosis when not only the laboratory reports but even the case-history is withheld from him. This is brought home most vividly when, as sometimes happens, a candidate is known personally to a board member who may, after the candidate has gone out, be able to produce for the board some of the missing data on which a judgment should be based. It is sometimes plain on these occasions that the information normally available to the board is but a small part of what needs to be known.

The second point is that, despite these difficulties, there is among the members of most medical-school boards at least one whose deftness marks him out, who succeeds in putting the candidates at ease and getting them to talk, and whose judgment one feels to be nicely balanced. How this is done remains mysterious. The ability is highly complex and usually quite unformulated in the minds of its possessors. It is unpopular to speak of any form of individual judgment as a reliable instrument, but it seems to me that there can be little doubt that it is sometimes not only reliable but amazingly sensitive. It is true that the best interviewers are not necessarily those who believe themselves so; and, as Smyth (1946) has pointed out, it is very important to find means of identifying the persons who show this ability most markedly.

At other schools the candidates are seen by a single interviewer, whose personal quality is all-important. Another method, introduced by Buzzard (1944) for certain types of interview in the R.A.F., has not, so far as I am aware, been given a trial by any medical school. In this an attempt is made to combine the advantages of interviews by a board and of interviews by one person. The members of a board, working on this system, act for half the available time as a panel of interviewers, each seeing a proportion of candidates for a fairly long interview, and later sit as a board to see briefly all the candidates.

For example, suppose that 60 candidates are normally seen for ten minutes each by a board comprising 6 members: this will take ten hours. If, instead, each member of the board interviews 10 candidates individually for half an hour each, there still remains time for the board sitting together to see every candidate for five minutes. This means that for every candidate there is one member of the board who has a considerable amount of information, gained under conditions more favourable to the assessment of personality than is the atmosphere of a board interview, and in many cases his considered judgment can be accepted by the board without more ado. The later interview with the board does, however, provide some check on the aberrations of individual judgment, particularly where members of a board are well acquainted with each others' foibles. Unlike many other suggestions for improved interviewing, this does not mean increasing the time spent by any member of a committee. In fact, in R.A.F. experience, it may actually reduce it. On the other hand, the time allotted to each candidate rises—in this example from ten minutes to thirty-five.

THE USE OF TESTS

Usually there are three ways in which a test can be devised. It may consist of a sample of the performance for which it is intended to be a test, or mimic it as closely as possible. This type of test is often successful, particularly in dealing with manipulatory skills, and sometimes surprisingly unsuccessful. It seems to be less successful the higher the ability concerned, largely because of the difficulty of securing a representative sample of a complicated performance.

The second form of test is based on an analysis of the performance in terms of separate abilities. This applies to the breakdown of complex motor skills into smaller functional units, and equally to the analytic proc which have been used in the Services in which qualities, such as intelligence, manual dexterity, believed to relate to the job in hand are abs and tested separately. The attempt to isolate pa faculties for the profession of medicine is likely to unprofitable, or so it appears at the moment. This to be because so many different activities are rep in the profession that it is found either that they practically nothing in common except a reaso standard of intelligence and personal integrity or the the prescription is composed of the cardinal virtu in aliquot parts. This is reassuring for those who hav already attained a medical qualification but not of muc practical value as a guide to selection.

Lastly, the tests can be empirically derived. In present connexion this entails a deliberate search those variables which give maximal discrimin between the proficient and the unproficient. In present state of applied psychology there is a deal to be said for empiricism intelligently used. Penrose (1947) points out, "from the point of view research, it is always advisable to proceed from known to the unknown"—to start with differen which are large enough to be unmistakable, and examining these differences and their correlates to the most efficient method of discrimination, which can then be applied to the border-line cases. It is when empirical relations are well established that causal principles can be hopefully sought.

INTELLIGENCE TESTS

Intelligence testing is the best established of all test methods. It has proved its value time and again where rapid separation over a wide range of talent is desired. When, however, the range is fairly narrow, particularly when it is at the upper end of the scale, new difficulties appear. It is extremely important to ensure that the test is appropriate to the group for which it is designed. The more obvious effects of failing to do this are seen the gross departures from normality of distri which appear when certain tests are given to univer students, the candidates bunching together at the end of the scale of marks (Edholm and Gibson 19 This may be corrected in a purely arithmetical by lengthening the test, shortening the time, or va the rate of increase of difficulty of the questions, but it is likely that devices of this kind merely accentuate the speed factor which is already too important in many current tests. There is a good deal of research going on today to explore the conditions of "appropriateness," and to find how they may be attained without either accentuating the speed factor or compromising the logical rigorousness of the tests.

It is sometimes overlooked that an intelligence test must not only be appropriate; like justice, it must be seen to be manifestly so. That is to say, trivial or childish questions must not be asked of an adult sophisticated assembly. There is a perfectly justifiable annoyance with tests of this kind. The debate in the House of Lords (1948) on Civil Service selection produced several examples.

Another point is that the test should not be confined to one medium of expression—to words, numbers, or diagrams exclusively. There is evidence that the differential effect of the medium of expression becomes more marked the higher up the scale you go; and, unless it can be shown that one medium is of greater diagnostic importance in a particular setting, it seems safer to include all three.

Two further difficulties remain to be considered. The effect of practice on these tests is not entirely certain, either where a man has done a single test of a different kind at some previous time, or where there has been liberate coaching. It cannot be denied that practice fects scores on intelligence tests—it is difficult to nceive why anyone ever thought otherwise—and recent ork suggests that in certain circumstances it may fect them far more than was thought. It will probably important also, if these tests are to be used for edical students, to examine more closely the effect of ugs such as caffeine, amphetamine, and glutamic acid. is generally thought at the moment that these sub- ances may improve scores, by increasing speed of orking, but not sufficiently to be of practical importance.

OTHER TECHNIQUES

The search for what are generally called "specific titude" tests is likely to be something of a will-o'- e-wisp so far as the medical profession is concerned. ere are far too many such aptitudes required in some gree by all doctors, and apparently none required in gh degree by all doctors. This is not to say that specific titude tests may not be important in advising intending ecialists, though their value has still to be shown.

Interest questionnaires may perhaps be of value, but st are American and need careful revision if they to be tried under English conditions. However, the essment of direction and extent of interest ought to possible, and would be likely to have much selective lue. Temperament tests and questionnaires are nerally disappointing. Perhaps temperament is too id a concept ever to be assessed by cut and dried thods; possibly the difficulty is that it is only at very extremes of the scale that we have any clear a of what we are looking for. Finally there remain ts of achievement—of realised, and not potential, pacity. These are now being used extensively in nerica. They differ only from the traditional written aminations in that greater care is taken to cover a resentative sample of the field of knowledge that is ng examined, and generally some form of multiple- ice question is used to make marking speedier and re objective. School records and ordinary written aminations have been used for the same purpose. eir disadvantage is that they necessarily measure lievement in some anterior discipline, which may or y not be relevant. However, most of the evidence ggests that the best prediction available at the moment based on a combination of a suitable intelligence test d some record or examination of scholastic achievement senck 1947, Salter 1942, Moss 1933).

CONSISTENCY AND VALIDITY

onsistency is also called "reliability," but the word misleading and is dropping out of use. A test is arded as consistent when it gives a similar rank order ong subjects in successive trials, or when two halves a test give a similar rank order. These two criteria distinct. In the split-half estimation alternate ms of the test are taken to constitute the two halves, d the correlation between them is found for a group subjects. The correlation will be reduced if the test iterial is grossly heterogeneous, or if the form is such at chance plays an important part in determining responses given. In the test-retest estimation there the further factor of day-to-day fluctuation in the res of individual subjects. The effect of practice, if cts differentially in different parts of the score range, y also upset the correlation.

alidity is estimated by comparing test results with e criterion external to the test, such as measurements proficiency, and ratings of success in a particular upation. Obviously nothing can be learnt about the idity of a test from test results alone.

t will be apparent that a test may be perfectly sistent without being valid in any degree, but that validity is limited by its consistency. Both consistency validity are best measured by the ordinary methods of correlation, which give values ranging from zero, when there is no relationship, to + 1 or − 1, when there is perfect positive or negative association. Such coefficients are useful working tools in evaluating a test in a particular situation. They have no absolute meaning, and their extension to any different situation carries the usual dangers of extrapolation. In general, smaller coefficients are to be expected with more highly selected groups, because of the restriction in variance.

The word "test" has been used in discussing consistency and validity, but there is no reason why other methods of selection should not be examined in the same way. Certainly any form of written examination can be so treated, with results which sometimes surprise those who regard examinations as better founded than intelligence tests.

MEDICAL RESEARCH COUNCIL INVESTIGATION

A planned attack on the problem of selecting medical students has been advocated for some time (*British Medical Journal* 1946, Bartlett 1946, Barling 1948) and a start has now been made under the ægis of the M.R.C.* on a long-term investigation in which it is proposed to follow up a year's entry at several medical schools. An intelligence test which is judged suitable has been given to these students in their first year, and in certain schools various other tests have been used. It is the aim that the investigators should get to know the students included in the follow-up by a series of informal interviews and, where possible, under the conditions of their daily work.

The interviews are biographical in type. They are designed to gather as reliably as possible certain information about the student's past history; his family and social background, childhood and education; Service record; and present interests and habits of study. At first three-quarters of an hour was allotted to each student; later the time was raised to an hour, since it is important, where full records are required, that there should be five or ten minutes left after a candidate has been seen before the next is due. This allows for the completion of the interviewer's notes and gives him a chance to think about the information he has elicited. An ad-hoc rating system has been used to compare the students as regards certain temperamental qualities; but the emphasis has lain on recording facts rather than interpretations or impressions.

These interviews and tests are given in the first year of training. In the follow-up, assessments are to be obtained at each stage from teachers and others in contact with the students. The results of professional or college examinations will also be used to give a picture of the students' progress. Particular attention will be given to defining the proximate cause of failure in those who drop out.

Four features of the investigation may be emphasised:

(1) Tests which can be objectively scored and which may eventually prove of practical value in selection are being given but will be regarded as ancillaries in the general survey. Though it will be important to examine the relation of test results to standards of achievement, the validation of tests in this context is not regarded as the only, or necessarily the most important, object of the investigation.

(2) These tests are given experimentally; it is not proposed that they should be used to influence the

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* An advisory committee for this investigation was constituted by the Medical Research Council in December, 1947. The members are Prof. Sir FREDERIC BARTLETT, F.R.S. (chairman), Prof. ESTHER KILLICK, Prof. J. PATERSON ROSS, Prof. L. S. PENROSE, Prof. D. H. SMYTH, Prof. CLIFFORD WILSON, and Dr. A. D. HARRIS (secretary). Besides advising directly on the conduct of this research, it is hoped that this committee will fill a valuable place in keeping other workers in touch by the circulation of accounts from time to time of projects undertaken at other medical schools.

injudicious opening question or by the number and eminence of their audience. Most of all one is struck by the paucity of information available to the board; continually they are in the position of the clinician asked to make a diagnosis when not only the laboratory reports but even the case-history is withheld from him. This is brought home most vividly when, as sometimes happens, a candidate is known personally to a board member who may, after the candidate has gone out, be able to produce for the board some of the missing data on which a judgment should be based. It is sometimes plain on these occasions that the information normally available to the board is but a small part of what needs to be known.

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PSYCHIATRIC SCREENING OF MEDICAL STUDENTS

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At Leeds University the increase in the number of pplicants for places in the medical school has become so reat that selection has become a serious problem. At resent about 400 prospective students have to be nterviewed between January and June. Out of this umber about 75 can be accepted. There are signs that ie number of applicants will rise still further.

The present method of selection is best described as ie "old method"—i.e., a personal interview by three terviewers. The Board of the Faculty of Medicine ive appointed a panel of about fourteen interviewers. wo of this panel, plus the senior administrative officer, rm an interviewing committee. The numbers of pplicants necessitate about three interviewing sessions week throughout two terms. These sessions last nearly ree hours, and about ten candidates are seen. This lows about fifteen minutes per interview. On the hole, it will be impracticable to increase the number of ssions, and an increase in the number of applicants ill lead to decreased interviewing time to the detriment its reliability.

The interview technique is non-standardised, and the ndidate is assessed on his academic achievement and rsonality. Personality is assessed as a result of a ide range of questions on the candidate's reasons for siring medicine as a career and on his general interests d activities. His general demeanour, &c., undoubtedly ve a subjective influence on the interviewers, and this luence is probably of as much importance in formulat- g an opinion as are the answers given to questions. hether it is as reliable as more objective factual ormation is open to question.

One of us (R. O.) has been a member of the interview- g panel and felt that it should be possible to develop echnique which would enable us to screen from the ss of applicants those who would be considered totally suitable by an interviewing committee. It was not gested, nor is it felt, that psychiatric selection should lace the old method; rather is it suggested that the t of both methods be used. If screening can leave out 250 candidates for interview and reliably pick the bottom 150, it would give the interviewing mmittee more time per candidate, which should rease their reliability. If the number of applicants reases much, some such technique will become a cessary evil. To many people the emphasis will be ced on the word "evil," but the word "necessary" certainly of equal importance.

There is much criticism from all quarters of modern ection procedures; the War Office Selection Board and its Civil Service equivalent being heavily criticised by many. The Conference of the Home Universities (1947) had a long discussion on the basis of selection of students. This discussion brought out most of the arguments for and against modern selection procedure—particularly against. There was little criticism of the older examination methods and a too ready acceptance that the examination was a reliable indicator of academic achievement. To quote Dr. J. F. Mountford: examinations "provide a simple and reasonably reliable means of ascertaining whether a given academic standard has been reached. They testify not only to a measure of intellectual ability but also to industry, without which no university course can profitably be pursued." This is a generally accepted view—accepted, however, without criticism or investigation. Yet Vernon (1940) states that "most examinations are very defective methods of measuring the achievements or the future promise which they set out to measure." He gives what appears to be good evidence in support of this statement throughout his book.

Whatever criticism there may be about the so-called intelligence tests, inter-test correlation is fairly high, and the results obtained by different testers on the same person show a high degree of agreement. Different examinations to test the same knowledge and different examiners are apt to, and do, produce widely differing results. This fact is conveniently forgotten by those who criticise modern testing procedure. It is unfortunate, however, that tests of intelligence have been used by relatively untrained people. There are many pitfalls, and intelligence testing is not something which can be done by anybody—it is an expert's job.

In approaching the problem of screening prospective students we were well aware of the many difficulties. Above all, such a method should be fair. No-one rejected by such technique should even be a border-line possibility. All "possible" medical students should be interviewed, because the interview is regarded as a fair method. In this country not only must justice be done but also it must be apparent that it is done. The main objection of most people to psychological testing is its "secretive" nature, and it is therefore impossible for all and sundry to assess its fairness. To summarise, psychological testing procedure has many pitfalls but, on the whole, the awareness of these does not only rest with those opposed to it. In fact, those concerned with psychological testing are usually aware of more difficulties than are those in the opposing camp.

OBJECTS OF THIS SURVEY

Before one can begin to use screening, one must first know something about what one is trying to find. Accordingly we decided to test a group of known medical students to obtain some "norms." It was also a means of trying out our preliminary test material which we knew would probably require amendment in the light of experience. Ultimately we hope to test groups of applicants (30–40 in a group) but not to influence selection by the present method. In two years we should have some indication of the reliability of our methods by following up students. In particular, we would be interested to see how "our" failures, who were accepted after interview, progressed.

We had hoped to obtain material from about 100 students. We picked a random sample of 100 and asked for volunteers. Unfortunately, end of term and pressure of work prevented many students from attending, added to which many did not volunteer. This has spoilt our sample, since it is likely that more inadequate students would volunteer less readily, and our numbers are small. We hope to extend our survey until we have sufficient material to provide us with an adequate guide to the "medical student."

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students' career in any way. It has been objected that test scores may be affected by the putative importance to the student of doing well in the test, and that correlations may be misleadingly low under the experimental conditions of this inquiry. However, the choice is not an open one. Medical schools are rightly not prepared to use these tests effectively without some evidence of their value. Nor would it be at all easy to get evidence for validation purposes, if the follow-up population was itself selected on the basis of the tests.

(3) It is of paramount importance to secure the collaboration of the medical students. For this reason, if for no other, a clear undertaking must be given that individual records will be treated confidentially. No compulsion can be exercised on students to participate, and it seemed at first that there would be sampling difficulties, since volunteers for any investigation generally contain too high a proportion of the gifted and the energetic, whereas what is required is either a complete sample, a deliberately representative sample, or a random sample. In practice it has been found that the samples which are being obtained are very nearly complete. It is perhaps not too early to say that the willingness of medical students to submit to interviews and tests, administered by some "snooper" from outside, is a great tribute to their long-suffering.

(4) It was realised at the outset that to take examination results as the only criterion by which to judge success would be extremely misleading, and it is intended that the follow-up should not stop short at qualification. At that stage it is of even greater importance that the students, by then doctors, should be fully in sympathy with the aims of the inquiry. It is clear that the longer the follow-up can be extended the more useful it becomes, and the better the chance of assessing "success" or "failure" reliably.

Such an assessment is not an easy proposition. There is no single graduated measure which can be applied, and it is in the largest group of the profession, the general practitioners, that attainment is most difficult to gauge. But there can be little doubt that differences of proficiency are sufficiently recognisable to allow of a division into five or six groups in the way that Paget (1869) classified his students. It may be possible, by taking several defined and measurable criteria, to reach a still greater accuracy, but there is always a risk of allowing mathematical precision of treatment to outrun the biological content of the data. With the establishment of a compulsory period of a year's internship after passing the final examination, and before a licence is granted for independent practice, the task of estimating proficiency is likely to become easier in the first postgraduate year; however, time has still to be found for the legislation to effect this change.

Specialists present a different if somewhat easier problem—there are various milestones which succeed one another in the path of the intending specialist, and there are various honours which crown his progress. They may be unreliable guides in individual cases, but they do, on the whole, provide a recognised and workable hierarchy. The separation of those suited to specialist or research jobs from those suited to general practice may prove easier than the separation of "good" from "bad" practitioners in any particular category. It has already been suggested that it cannot be taken for granted in a time of change that the same qualities will always be required of doctors—curative and preventive medicine may call out very different qualities of mind—and in the interests both of the community and of the doctors it will be important to see that the students accepted are the right ones for the job they will have to do.

STATISTICS OF MEDICAL TRAINING

There is a further, as yet practically unexplored, field in connexion with the vital statistics of medical training. A pioneer study has come from Greenwood and Lewis-Faning (1937), who remark that "the statistics of medical graduation may be the starting-point of many curious inquiries." They examined, in the form of a life-table, the time taken from matriculation to qualification by 1254 Cambridge medical students. Greenwood and Teleky (1942), who carried the follow-up to twelve years, found that 15% had not qualified within this time, and that 33% of the total had taken over nine years from matriculation.

The figure of 12½% was accepted by the Interdepartmental Committee on Medical Schools (1944) as an estimate of the wastage-rate during training, but definite figures were available to them from only one medical school. Figures which I have seen from two other schools suggest that the rate is now sometimes rather higher. Accurate figures, however, can easily be obtai for the groups which are now being followed up in the M.R.C. investigation. Clearly differences in the wastage-rate may reflect important differences in methods of selection or training at different schools. It is a common experience in other occupations that, when reliable figures are obtained, wastage is found to be higher than had been expected. This is particularly true of an institution such as a medical school, where most of those who think about it have only a partial experience of the wastage—i.e., wastage during a particular year or two years of training.

A statistic which is more difficult to estimate is the selection ratio (ratio of applicants to available places). This problem is complicated by the number of those who apply to more than one school. (The appearance recently of duplicated letters among applications sent *to all the schools in turn*, with the name of the school typed at the top, is perhaps a danger signal.) Th there may be an increase in the number of applicati either because more people apply or because the same number of people make more applications; equally factor of multiple application may disguise a fall in number of applicants. As a part of the M.R.C. inves tion, information is being sought on the extent importance of multiple application. Twenty-six m schools have agreed to supply to the M.R.C. adv committee the necessary information for an analy be made.

CONCLUSION

What may be the upshot of a follow-up investig such as I have tried to sketch above? Fundament we are seeking to discover whether there are met either among those already in use or among those w may be devised or adapted for the purpose, which give a better than chance expectation of ch candidates likely to succeed in a medical career. To this it is necessary to evolve criteria of success which not of solely academic purport.

The practical problem, which has to be kept contin in mind, is that which today faces the selection comm in every medical school. As Lyon (1933) has said, "t have before them applications of two hundred, hundred, or four hundred students. They can perhaps, one hundred. If they have no basis at all prognosticating, the proper thing would be to all the names into a hat and draw out one hun It is to be hoped that in the future we shall have to echo his further remarks: "If they have dis methods of any value at all, they should use those to the best of their ability. . . . If prognostic c are good to the extent of even 25% in any combi we ought to use them. In fact, we must use the

References at foot of next page

Our thanks are due to Prof. H. V. Dicks, of this department, for his encouragement; Prof. M. J. Stewart, dean of the medical school, for his permission to proceed with the survey; Dr. T. A. Divine, the senior administrative officer, for giving ery assistance and help in making arrangements for g; and, last but not least, the students who so kindly teered.

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TELLIGENCE TESTS AND UNIVERSITY CAREERS OF MEDICAL STUDENTS

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PLYING the matrix test (Raven 1938) to second-year ical students Edholm and Gibson (1944) found that as of little value in predicting their performance hysiology examinations. Heim and Timpany (1944) ested that this result was due to the unsuitability e matrix test for application to a selected high-grade p. In spite of this justified criticism it seems worth rting the results of a follow-up of the students inally tested, since all have now completed at least years' study.

further group has been tested both with the matrix and with the Cattell scale III form A test (Cattell 4), which contrasts sharply with the matrix test in t it is largely verbal and is sufficiently difficult to ead the group over a considerable scale.

The tests were applied as described by Edholm and son (1944), and the follow-up data were obtained from official university records. The data are incomplete ause: (1) the tests were not taken until the second r and so do not include students who failed to complete first-year course; (2) the tests were not compulsory; (3) wastage of about 10% has occurred in the follow- owing to death, marriage, war service, and transfer other universities.

FOLLOW-UP OF UNIVERSITY CAREERS

uccesses in Relation to First M.B. Examination.— results for each of the years considered are shown arately in fig. 1. In this figure the total length he first column for each year represents the number students sitting the first M.B. examination. The pled columns show the numbers of students after h examination in the course who, having passed the t M.B. examination at their first attempt, have passed h subsequent examination with- failing in any up to the amination indicated. The ched columns give the same rmation for students who had or more attempts at the first examination. The difference veen the two groups is obvious: reas most students passing the M.B. examination at one mpt (stippled columns) proed directly to qualification, of those completing the mination piecemeal (hatched nns) failed again later in the e.

ilures in Relation to First Examination.—Table I s, for 1942 and 1943, the bution of failures per head e various examinations gh the course. In this table the students are divided into three groups according to the number of subjects passed in the first attempt at the first M.B. examination. Fig. 2 illustrates the growth of the cumulative totals of failures for the same groups, and again shows the striking difference between the group passing the first M.B. examination at the first attempt and those completing the examination by stages. Of students in group I only 2 (2·5%) have not yet qualified as against 21 (27%) in groups II and III.

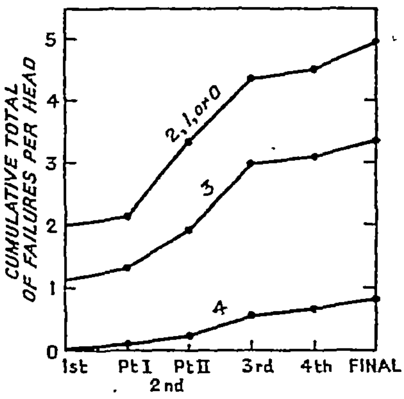

Fig. 2—Cumulative total of failures per head incurred by students having passed in the number of subjects shown in their first attempt at the first M.B. examination.

Preclinical and Clinical Results.—It is sometimes suggested that the preclinical years call for a set of qualities different from those required in clinical work, and that rigorous selection of students on the basis of results in the preclinical years would lead to the elimination of many potentially satisfactory clinical students. If this were so, a follow-up should reveal a tendency of this kind. Students were classified according to their records in the anatomy and physiology courses and their records in the clinical years. Table II indicates not only that the preclinical and clinical results are associated ($P = 0{\cdot}0001$) for each year, but also that there are very few students who, having failed in the preclinical years, then complete their clinical course without a check. It appears that special aptitude for clinical work is rarely divorced from ability to pass the preclinical examinations.

INTELLIGENCE TESTS

Matrix Tes and Clinical Examinations.—Edholm and Gibson (1944) have considered the relation between the matrix test and preclinical examinations; using the material obtained in the follow-up, it has been possible to extend this to the complete course. The results are summarised in table III. Though there was some degree of positive association in all cases, this was significant only for the preclinical years. The existence of positive association, however slight, in six independent instances nevertheless argues for some relation between the matrix test and the results of the clinical years taken as a whole.

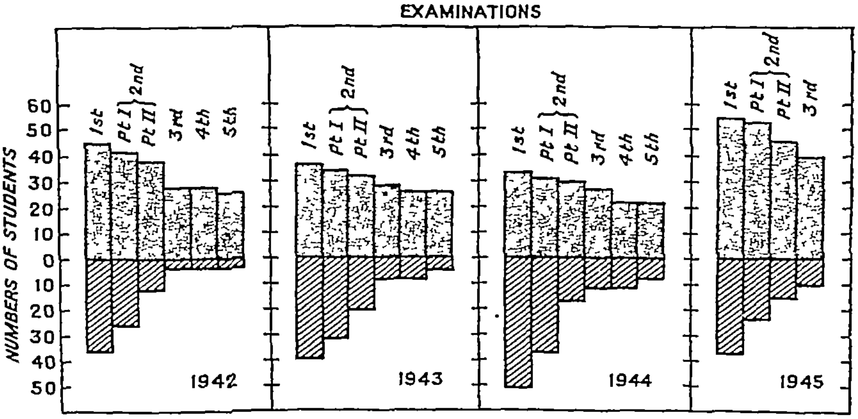

Fig. 1—Examination results: stippled columns, students who, having passed the first M.B. examination at the first attempt, passed the examinations indicated and all previous examinations at the first attempt; hatched columns, students who had more than one attempt at the first M.B. examination and then passed the examinations indicated and all previous examinations other than the first M.B. examination at the first attempt.

METHODS

Our test material can be divided into three main sections:

(1) Material usually obtained at interview: (*a*) family history; (*b*) academic background and achievement; and (*c*) general activities and interests. This material was obtained by questionnaires, and the resulting evidence appears to be as useful as the same evidence obtained by interview.

(2) Intelligence tests: (*a*) the Raven progressive matrices (20-min. version); and (*b*) the group test 33 of the National *Institute of Industrial Psychology*. *This latter test* was standardised on secondary-school children. It discriminates better between various levels of intelligence in the upper ranges.

TABLE I—INTELLIGENCE-TEST SCORES OF 40 MEDICAL STUDENTS

—	N.I.I.P. group test 33		Raven's progressive matrices (20 min.)	
	Average	Av. deviation	Average	Av. deviation
Men ..	146	12·0	49	4 6
Women	159	12 6	50	3 0

(3) More purely psychological tests: (*a*) a personality inventory of much the same type as the Mill Hill neurotic inventory described by Eysenck (1947); and (*b*) the "expanded" multiple-choice Rorschach test. We projected the Rorschach cards on to a screen. On a printed sheet were three sets of ten answers for each card. Students were asked to indicate which was their answer of choice in each set for each card in turn. This follows the technique described by Erickson and Steiner (1945).

The whole testing procedure occupied about 2½ hours. Our groups were small (4–12), but groups of 30–40 could be managed quite well.

RESULTS

The analysis of each set of questionnaires, plus the marking of intelligence tests and the multiple-choice Rorschach test, was a task where each of us had an allotted field. The clinical psychological material was marked by the psychologist, and the rest of the material was passed to the psychiatrist for final assay. A précis was made of all the material, at the end of which was written a short assessment of the candidate plus a grade. The gradings given were:

A. Definitely superior. Should get honours.
B. Definitely above average.
C. An average medical student.
D. Definitely below average but should eventually qualify.
E. Inadequate and unsuitable.

The final assessment of the material obtained is a subjective one in little way different from an assessment given after the usual interview. Interviewers vary greatly in their ability to assess personality. The psychiatrist is no magician, but his everyday job entails the assessment of personality and he should therefore be an adequate person to make a final assessment of the person interviewed. He tries to be objective but realises that his own personal bias will influence the results. He tries constantly to remove this error but he is not unaware of it. Some of the material we obtained can be expressed in figures (table I).

The women showed a significantly higher average of verbal intelligence. In fact, five of the women had a higher score than any of the men. This result was expected since, though half the applicants for entry to medical school are women, much less than half the acceptances are women. In other words, selection is more intense, and only women applicants who appear outstanding are accepted. These figures demonstrate that the interviewing panel manage to pick out the intelligent ones fairly well. Most interviewers agree that picking out the very superior is easy. Picking out the lower average type is much more difficult.

The lowest scores in each group are of interest since they give some indication of the lowest adequate level of intelligence needed for academic success. The four lowest scores for men were (group test 33) 107, 12 129, and 129. For women they were 124, 131, 140, and 145.

From our assessment we are inclined to feel that any score over 120 on group test 33 would indicate just adequate intellectual ability. This corresponds to an average secondary-school child and is probably equivalent to an I.Q. as low as 110. On the other hand, our results suggest that a minimum of about 135 would ensure much more adequate students. This level represents the 70th percentile of secondary-school children and an I.Q. of about 118. This figure has previously been reached by workers in this country and in U.S.A. as being the minimal adequate I.Q. for success in medicine.

Our final results were compared with similar gradings given by the senior administrative officer, who graded the students according to their academic success in the medical school. Table II shows the degree of agreement and disagreement between the gradings.

These tables show sufficient agreement for such small numbers to give us encouragement to continue.

We have made no comment on the value of the multiple-choice Rorschach test, because the numbers are small. All but one student gave adequate responses to this test. This student was rated D by us, but academically he was very nearly rated E, and there may be something of value in this test. This is a point we are investigating further.

CONCLUSION

So far the amount of testing we have done is inadequate for us to lay down any firm propositions, but we are encouraged. One point that interests us now is the result we shall get when we test large numbers of applicants. We feel we shall see a much wider scatter, and we hope to be able to show that screening can effectively and fairly reduce the number of applicants requiring to be interviewed. An important point not mentioned is how far academic success in medicine indicates a good doctor. Some of our disagreeme between academic success and our test ratings probably due to the fact that we were trying to as good future doctors and not necessarily those who w achieve academic success.

TABLE II—COMPARISON OF RESULTS OBTAINED BY DIFFE METHODS OF GRADING

Grading from test analysis	Grading on academic success					To
	A	B	C	D	E	
Men students A	—	—	—	—	—	[illegible]
B	—	1	1	2	—	[illegible]
C	—	—	5	3	—	[illegible]
D	—	—	2	8	—	[illegible]
E	—	—	—	1	1	[illegible]
Total . . .	0	1	8	14	1	[illegible]
Women students A	—	—	—	—	—	[illegible]
B	—	2	1	—	—	[illegible]
C	—	—	2	3	—	[illegible]
D	—	—	6	2	—	[illegible]
E	—	—	—	—	—	[illegible]
Total ..	0	2	9	5	—	[illegible]

An example will explain the tables. Of eight men r C by test results, five were rated C and three D by aca results.

THE SELECTION OF MEDICAL STUDENTS

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THE Interdepartmental Committee on Medical Schools 1944) asked for further experimentation in methods of ing medical students. In this country Edholm ibson (1944) and Smyth (1946) have reported on ethods tried out in two medical schools. The eport did not hold out much promise for the further f the chosen tests for purposes of selection. The d report contained evidence of an encouraging tion in the number of failures by the use of a l battery of tests.

the United States Cowdery and Ewell (1931) and (1931, 1933) have shown that failures among al students can be predicted with a good deal of acy by the use of selection tests. They have shown these tests are superior to premedical grades in their tive capacity, and that the tests in combination premedical grades can predict 73% of subsequent es in examinations. The results of these investiga- were sufficiently promising to lead to the introduc- in 1931 of routine selection tests in all U.S. medical ols. Many of the schools count the marks resulting testing as a third of the total score given to a student; emaining two-thirds of the score is contributed by edical grading and the results of an interview.

the United States one of the main factors causing the sive investigation into selective tests for medical is was the need to reduce the failure-rate, which been as high as 20% in some institutions (Flack Begg (1928), in a survey of failures between 7 and 1926, showed the percentage to be fairly tant and to lie between 18% and 20%. Zapffe 33) reported a distinct decrease in students' failure- between 1931 and 1933, which is attributed by Flack 36) to the introduction of aptitude tests as one of the es of selection.

he need to select those who are most able to benefit a university education has become increasingly ent in this country with the rise in number of licants for such training. The ratio of applicants vacancies is particularly high in the medical schools. St. George's Hospital Medical School, for example, he six months from October, 1947, to March, 1948, e were 270 applicants for the 30 places available; there are indications that the situation is similar ome other medical schools (Smyth 1946).

n most medical schools, in the absence of predictive s, the selection is made on the basis of premedical des and interviews. There is a real danger in relying premedical records. This was pointed out by Moss 31), who, after a careful survey of the problem, stated t premedical grades were not a sufficiently fine riminative guide, and therefore there was a likeli- d of turning down very good men to make way for liocre students. The introduction of intelligence s, in addition to the scrutiny of premedical grades, lers such mistaken decisions much less probable— a measure of intelligence, as distinct from one of evement, provides crucial information.

knowledge of the student's potential intellectual ty and past achievement, however, is not enough, personality, even if it is not so accurately measur- as intelligence, contributes a great deal to the tiveness of the student and the doctor. Thus, in of the introduction of routine testing in the U.S. cal schools, there still appear to be failures among nts of high intelligence, which have caused serious rn to at least one university. Waggoner and r (1946), at the University of Michigan, reported on an examination of medical students by means of the Rorschach test and a psychiatric interview:

> "Among students with even very high I.Q.'s, a relatively minor maladjustment occasionally resulted in academic difficulties. . . . On the other hand, it appeared that strong motivation and good adjustment could often compensate for an I.Q. which under average circumstances would be considered inadequate."

Their conclusion that there is need to take into account other aspects than the ability of an individual student is supported by two earlier investigations of university students. White (1931, 1932) compared "discrepant failures" with "discrepant successes" of students of the same intelligence. The former were found to be more frequent in students handicapped by mental disabilities of the anxiety type. Neel and Mathews (1935) showed that the "non-achievers"—those of high intelligence whose grading did not reach expected level—more often experienced conflicts about religion and life in general than did the "achievers." It is clear that measures of maladjustment would form valuable additions to tests of ability in the selection of students.

With this problem in mind a study was carried out on the students in St. George's Hospital Medical School in 1947–48. An attempt was made to select a group of tests which, in conjunction with school record and interview results, would indicate ability to pursue a medical course successfully, and might be used in selecting students for admission to the medical school. The present investigation, in addition to measures of intelligence designed for the more gifted of the population, included measures of personality maladjustment or neuroticism.

The prevalent use of only one type of intelligence test has been criticised (Treddick 1942) on the grounds that such measures are likely to be less diagnostic than are several tests measuring different abilities. The ability tests included in this investigation were chosen to meet this need.

The subjects consisted of 49 men and 8 women students of St. George's Hospital Medical School with a mean age of 24·37 ± S.D. 4·35. The average age was relatively high because of the many ex-Servicemen in the school in 1947–48.

All the intelligence tests show small negative correlation with age—i.e., there was a slight tendency for the older students to do less well on the tests than did the younger ones. These negative correlations seem to bear out the opinion of the teachers in medical schools that the older student has additional difficulties in his course when compared with the younger.

INTELLIGENCE TESTS

It was necessary to use intelligence tests which differentiate well between persons of high intelligence, since university students are to be found at the upper end of the distribution curve of intelligence. Vernon (1939) and other authorities have reported an average I.Q. of 126 for university students. Besides the higher level of intelligence among students, the range of intelligence among them is smaller, a fact which emphasises the need for the test to discriminate well at the higher levels of ability. Edholm and Gibson (1944) have shown that unsatisfactory results are obtained when tests are used which are not intended to discriminate among those of very high intelligence.

Himmelweit (1948) has carried out an inquiry into suitable intelligence and personality tests for the selection of students at a college of a university. She used, in her investigation on several hundred students, tests of general intelligence and tests which, besides general intelligence, measured group factors, such as verbal and memory factors. Out of this battery those tests which appeared to be most promising and to be most closely related to the special abilities required of medical

Matrix and Cattell Tests.—A total of 95 students completed both tests. The results for the Cattell test were converted into I.Q. figures according to the standardisation given by the author (Cattell 1934). The matrix test was applied as described by Edholm and Gibson (1944) with a 20 min. time limit. The results were: matrix test, mean 47·4, median 48, standard deviation 6·4; Cattell test, mean 139·3, median 140, standard deviation 11·0. The coefficient of correlation, $r = +0{\cdot}30$, though highly significant, is surprisingly low, suggesting that the two tests are measuring substantially different quantities. When correlated with physiology-class examination marks, the Cattell test gave $r = +0{\cdot}325$, whereas the matrix test gave $r = +0{\cdot}249$. Neither of these values is strikingly different from the correlations found by Edholm and Gibson between the matrix test and physiology-class examination marks in previous years.

TABLE I—SUBSEQUENT FAILURES IN RELATION TO FIRST M.B. EXAMINATION

Group	No. of subjects passed in first attempt at first M.B. exam.	No. of failures per head						No. of students
		First M.B. exam.	Second M.B. exam.		Third M.B. exam.	Fourth M.B. exam.	Final exam.	
			Part I	Part II				
I	4	—	0·06	0·14	0·36	0 09	0·15	80
II	3	1·15	0·16	0·59	1·10	0·12	0·48	39
III	2, 1, or 0	1·70	0·42	1·23	1 00	0·15	0·45	40

The students tested have now completed the course except for the final M.B. examination, and 91 have been successfully followed up. Some idea of the relative predictive value of the tests may be obtained by noting the numbers of failures incurred by students grouped according to their test performances (table IV). Both tests are negatively associated with the numbers of failures in the different groups. The association is highly significant for the Cattell test, but the value for the matrix test is not significant.

DISCUSSION

The results of the follow-up have substantially confirmed the earlier conclusion of Edholm and Gibson (1944) that the matrix test does not possess any great value in predicting examination results. The Cattell test, though different in form and only slightly correlated with the matrix test, does not appear to be much better. The results suggest that little can be done towards the problem of student selection by means of standard commercially available intelligence tests, except that students with notably low scores might usefully be eliminated. For example, if correct solution of 41 problems in the matrix test in 20 min., or of 46 problems in unlimited time, had been made an arbitrary requirement for admission, 49 students would have been rejected from the four years considered. Of these 49 only 7 have clear records at the university. If the test had been applied at the end of the first year, and a reprieve allowed to those with a clear university record at that time, 3? would have been rejected, all of whom have, in the event, had chequered careers.

TABLE II—NUMBERS OF STUDENTS CLASSIFIED ACCORDING TO THEIR PERFORMANCE IN SECOND M.B. AND IN LATER CLINICAL EXAMINATIONS

Year	Pass clinical, pass second	Pass clinical, fail second	Fail clinical, pass second	Fail clinical, fail second
1942	29	2	23	22
1943	33	3	18	18
1944	29	5	16	23

TABLE III—ASSOCIATION BETWEEN MATRIX TEST AND EXAMINATION RESULTS

Examination	Probability of independence		
	1942	1943	1944
1st M.B. ..	0 029	0 024	0·0009
2nd M.B. ..	0 30	0·016	0·0077
3rd M.B. .	0·38	0 50	0 53
Final	0·14	0·35	0 70

The attributes examined were (1) obtaining a score in the matr test equal to or greater than the median score and (2) passing the examination indicated at the first attempt.

On the other hand, the follow-up has shown that th is a striking consistency in the performance of t individual student, the pattern of whose career is of foreshadowed by the results at the end of the first ye The close association between the results in clinical a preclinical years suggests that it might well be profita to proceed by admitting a number of students somewh in excess of the capacity of the clinical departments, a rejecting with rigour at the end of the first and seco years. In theory, at least, such a scheme would reduce the proportion of "chronic" students.

In practice the results might well be less satisfactory, since intensive "cramming" for the first-year subjects would be encouraged. If an intelligence test were included in the programme for selection, even with due care ensure that its contents remained secret, its gen nature would gradually become known, and instruct in the design of the test and in the most profita approach to its problems might become available.

TABLE IV—RELATION OF MATRIX AND CATTELL TESTS TO EXAMINATION RESULTS

Matrix test score	No. of students	No. of failures	Cattell test score	No of students	No. of failures
52–60	27	30	147–	27	18
46–51	34	44	135–146	35	53
0–45	30	46	0–134	29	49
Probability of independence P = 0·45			Probability of independence P = 0 0017		

This survey is concerned with examination res and the conclusions drawn from it depend on the vali of such results as an index of future performance. The relation between academic success and effective pro fessional service to the community, however, is no known and appears to be most difficult to assess.

SUMMARY

The university careers of second-year medical stude taking the matrix test in 1942, 1943, and 1944 have followed up.

The relation between the test and examination r is slight.

The careers of individual students were remar consistent throughout the whole course.

The Cattell test, correlating only slightly with matrix test, and different in form, gave essent similar results.

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The judgments on which our criterion was based were made by doctors, several of whom are examiners at the qualifying medical examinations. They also included, as mentioned above, doctors who choose the successful candidates for the much-coveted house jobs.

It is not recommended that the valuable criteria already in use should be superseded by these tests alone. It is desirable, however, to have available all the possible measures of ability and personality before selecting the 10% or even 50% of applicants for whom there are places.

A fear has been expressed by some authorities that these selection methods might exclude some really good students. It is undoubtedly true that test methods of selection will probably exclude some good people; the point to decide is which method will exclude least. The data presented should make it clear that, whether the problem is viewed from the aspect of reduction of failures or the increase in the proportion of really outstanding students, the inclusion of selection tests of the type described can be of great assistance. This assistance at the expense of three hours' testing is not a great deal ask from even overworked medical students.

The results so far available† justify further research ith the tests used and for the selection of students in edical schools. The predictive value is likely to be creased by the further development of the personality sts in the battery. The information obtained as a sult of such testing could be used in addition to pre-edical rating and interview rating as a basis for the ceptance of students and their later guidance.‡

SUMMARY

The intelligence of 57 students at St. George's Hospital edical School was tested with seven verbal and non-rbal tests standardised on people of high intelligence. ree measures of personality were also used. By eans of individual ratings by two of the senior staff ost closely connected with each student, information as obtained on each student's medical standing. A ultiple correlation of 0·63 was found between the iterion and seven of the above measures. The reliability f the criterion was 0·80.

At the present ratio of selection in this hospital (1 in 10) e number of successful students could be increased from 0% as at present to 99%, and the proportion of out-anding students from 10% as at present to 39%.

I am indebted to Dr. Desmond Curran, physician charge of the psychiatric department, for suggesting is investigation and for his active encouragement. The k was made possible by the kind coöperation of the dean, r. M. F. Nicholls, his staff, and the students of the medical hool.

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he results of the qualifying examinations, as they become available, will be used later as an additional criterion.

nce this investigation was experimental, the results obtained in each student are confidential and unknown to the authorities and teachers of the school.

PERSONALITY STUDIES OF MEDICAL STUDENTS

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THE selection of leaders in the Army during the war has attracted widespread interest. It may seem incongruous that a technique fashioned within a disciplined community at war should be in any way applicable to the problems of a free society at peace, but already selection has been adopted by many organisations in civil life. Among those that have applied the principles of the War Office Selection Board (W.O.S.B.) are the Civil Service, the Indian Civil Service, the Palestine Police, the late National Fire Service, and armies of Allied countries.

No full account of officer selection and its results has so far been published. Rees (1945) refers to the subject in connexion with war psychiatry. Gillman (1947) has described the test procedures and the composition of a W.O.S.B. An Expert Committee (1947) has published a report which is mainly concerned with the selection work done by psychologists and psychiatrists in the Services. The only contribution to the theory of selection has been made by Gibb (1947), whose views on leadership are based on his experience of officer selection in the Australian army.

Recommendations have been made for the introduction of selection into medicine by the Interdepartmental (Goodenough) Committee (1944), the *British Medical Journal* (1946), and others. Some medical schools have begun to select applicants by means of intelligence, aptitude, and other tests (Smyth 1946, Wilkie 1946), and the Medical Research Council have sponsored research in several London and provincial schools.

Before considering its application to medicine, I shall give a brief account of the aims, theories, and methods of officer selection.

Selection of Officers in the British Army

Scientific methods of selecting officers were first introduced into the Army in 1941. The first experiments were stimulated by the fact that the German army had been using selection since 1926, and by the urgent need for officers created by the rapid growth of a citizen army and by the losses at Dunkirk. Traditional methods—based on rule of thumb, and efficient within the small class from which the pre-war regular officer was drawn—proved incapable of dealing with war-time candidates coming from every social class and representing an infinite variety of personality. Whereas, before the war, it was relevant to ask a candidate to what school he had gone and what his private income was, these questions were now not only useless but also objectionable. Indeed, they were so much the cause of dissent and dissatisfaction among candidates that in 1941 suitable men were refusing to apply for commissions. A radical change was therefore imperative, and it is noteworthy that the initiative for this change came from senior regular officers, who enlisted the aid of psychologists and psychiatrists in a joint trial of an entirely new method.

The experiments were carried out on several groups of officers attending a six-week course for company-commanders. These officers were given an intelligence test, an interview by a psychiatrist, and aptitude tests based on the German model. Results of these assessments were compared with reports by instructors, and in 85–90% of cases there was complete or substantial agreement between the two judgments. A provisional board was set up in January, 1942, to continue the students were selected. The tests used were adaptations of current American intelligence tests. They included one test of Thorndike's (1925) completion, arithmetic, verbal, and directive battery (C.A.V.D.)—namely, the C or sentence-completion test. Cowdery and Ewell (1931) have reported a high correlation between the C.A.V.D. battery and medical-school grades. The other tests, which were adaptations of some of Thurstone's (1938) primary ability tests, were tests of vocabulary, verbal classification, memory, fluency, non-verbal intelligence, and spatial perception. The test of spatial perception was included on the assumption that the problems confronting the medical student in anatomy required particularly good spatial visualisation.

MEASURES OF PERSONALITY

Neuroticism.—The two tests of neuroticism used were the Maudsley medical questionnaire (Eysenck 1947) and the Maudsley word-connexion test (Crown 1947). These two measures of maladjustment have been shown, on extensive investigations reported by these writers, to differentiate well between the neurotic and non-neurotic population. The tests were included in the belief that neuroticism was one of the major personality factors which would reduce the effectiveness of a student.

Tendency towards accuracy has been found to be positively correlated with success in examinations when intelligence was held constant (Himmelweit 1948). To reach the index of inaccuracy, the number of false answers given in all the tests except those of neuroticism and fluency was calculated, and expressed as a ratio of the total number of answers attempted in these tests. The index of inaccuracy was found to be positively correlated with both the Maudsley medical inventory (+ 0·40) and with the Maudsley word-connexion test (+ 0·43). This suggests that the more neurotic students tend to make a relatively large number of mistakes. The total testing session took three hours.

CRITERION OF PREDICTIVE VALUE OF TESTS

Two independent judges were chosen by the dean from among his senior staff as knowing most about each student. These judges rated the students, as regards their medical ability, on a five-point scale, ranging from very good to very poor. The considered judgment of two senior physicians, based on the working record of the student, has certain distinct advantages over examination results. Apart from examination not being an entirely satisfactory assessment of a student's all-round clinical ability, it is the opinion of the senior medical staff which determines which of the students is appointed to resident posts. The combined rating had a reliability of 0·80.

RESULTS

The correlations were worked out between each of the nine tests and the combined rating of the judges, and were as follows:

	Correlation
Word-connexion	−0·08
Vocabular	0·42
Classification	0·41
Rote memory	−0·11
Sentence completion	0·30
Fluency	0 20
Decoding	0·35
Form perception	0·39
Maudsley inventory	−0·16
Index of inaccuracy	−0·27

EXPECTED PROPORTION OF STUDENTS SELECTED WITH HELP OF TESTS WHO WILL BE SATISFACTORY

Selection ratio	Percentage considered satisfactory before use of selection tests*							
	90	80	70	60	50	40	30	20
0·10 (1 in 10) ..	100	99	97	94	90	83	74	60
0 20 (2 in 10) ..	99	98	95	90	84	75	61	50
0·30 (3 in 10) ..	99	96	92	87	79	69	58	43
0·40 (4 in 10) ..	99	95	90	83	75	64	52	38
0·50 (5 in 10) ..	98	94	87	80	70	60	47	31

* The figures in the table are derived from Taylor and R (1939).

A multiple correlation of all the tests except sente completion and the word-connexion list with the criteri was calculated, and the multiple R was found to 0·63.

The reduction of failures and the increase in succe to be expected from the use of these tests are sho in the accompanying table. The correlation of 0 is the basis throughout. This table presents the p portion of satisfactory students who could be selec with the help of these tests under various conditio *Along the vertical axis are indicated* the selection ra which may prevail at different schools—i.e., the p portion of places to applicants. Along the horizont axis are placed the percentage of students who are present considered satisfactory. In the body of the table are shown the percentages of students selected with the help of the tests who would be satisfactory, given certain selection ratios (set out on the left of the table), and given a certain percentage considered satisfactory before the introduction of tests (set out at the top of the table).

In this hospital 82% of the students were rated being satisfactory. The selection ratio as reported above is less than 0·10—i.e., 1 in 10 is chosen—and glance at the table will show that the percentage satisfactory students who could be selected with the of the tests is 99—i.e., the failures could be reduced 18% to 1%.

Alternatively one can consider the table from the vie point of those students rated "very good." were about 10% in this hospital belonging to the supe group. The selection ratio is again 0·10. The verti column of figures under 10% shows that with the of the tests we could have selected not 10% but 3 of very good students. But, even if the selection r should increase, and as many as 5 students out of applicants be chosen, the use of the tests would incre the number of very good students from 10% to 18%.

DISCUSSION

The results shown in this group indicate a high pr dictive value for the tests. External factors affecti medical work have not been studied—for example, th need to earn during college years, worries of various kind and family responsibilities must influence the student efficiency considerably. It is hoped, however, th further development of the measures of personality in th battery will indicate the ability of the student to co with such stresses.

The tests do not guarantee that those passing the will be successful, but they do ensure that they hav the ability to succeed if outside circumstances are favo able. It is recognised that the capacity to pass exami tions is not the hallmark of a good doctor, but it is c that a student will never get the chance to show wh *he is a good or poor doctor* unless he *passes examinati* There is a great need for much more investigation i what constitutes the good doctor, besides what constitut the good medical student.

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* All correlations are calculated by the product moment formula and have been corrected for attenuation in the criterion by Dunlap and Cureton's (1930) formula. The multiple correlation given below, in view of the small number of students tested, is probably a slight overestimation of the true correlation due to the well-known *tendency of the multiple correlations* formula to summate errors; but none of the conclusions are likely to be affected to a considerable extent. This is borne out by the fact that similar intercorrelations between the tests were obtained in other university groups where much larger numbers had been included.

tio has steadily increased since the end of the orld war, and after a plateau during the second s again risen steeply. Smyth (1946), who has ed the causes of this rise, concludes that it will ne for an indefinite period. The financial barrier licine having been largely removed, the profession open to anyone who has interest and competence. t methods of selection are proving inadequate, is is due both to the greater numbers and to the greater variety of applicants. The situation is in arallel to the situation in the Army in the early s of the war, and we may draw the same conclusion the older methods will soon show themselves as ded and unfair. Preferences for special types of nt will be seized on as examples of class prejudice, e same "atrocity stories" as circulated about old ds of officer selection will be heard in relation to ations for medicine.

at is therefore needed is a method of selection which pe with the large numbers and can at the same time ith the more complex issues of personality assess- No other method has so far been so well proved highly developed as that of officer selection. And, ering that W.O.S.B. dealt with a similar kind of ion problem in the young adult, the method bed seems applicable. Indeed, the special work d out in selecting schoolboys for six-month univer- ourses (CUBS) and for two-year engineering cadet- (CUBES) was highly relevant to the selection of al students.

Need for Research

fore scientific selection was introduced into the y, there was a period of preliminary research. opriate tests were devised and examined for relia- and validity. Details of an optimum programme of ng were worked out. Decisions were reached about proper composition of the board. Administrative ainery was set up. In addition, the undertaking was ly publicised, so that it could quickly and easily to the Army scene. The same kind of approach will eeded when selection is introduced into medicine. ntroduce a ready-made procedure in its entirety d be a gross error, and would violate the principle a selection scheme should be evolved from in and should be adjusted to serve its special ose.

Aberdeen such a period of research is envisaged by department of mental health. Though the bulk of work will be done by members of the department, uding a research fellow, it is an essential part of the eme that other members of the staff coöperate various ways. We also hope to maintain close son with the Medical Research Council, who are nsoring a parallel scheme of research in other dical schools.

The aim of the experiment is to gain as much relevant ormation about each first-year student as possible, l to follow him up throughout his undergraduate eer. So that the data obtained shall be comprehensive, students will be strongly urged to submit themselves untarily to the testing procedures. These procedures e still to be worked out in detail, but will be based on .S.B. principles. They will include written tests to vide basic information—intelligence tests, general- wledge tests, biographical and attitudinal question- res, and psychological tests, mainly of the rojection" type, such as the Rorschach test. Reports headmasters and examination results will also be used. erviews, carried out by members of the department of ntal health and possibly others conducted by members other departments, will be an important section of the cedure. But it is expected that much valuable and information will be elicited by means of group tests on the "leaderless group" model of Bion. In the essentially human profession of medicine it is of paramount importance that the doctor should be able to put his knowledge into everyday practice with his patients. At present no attention is paid to this aspect of a doctor's make-up. It is hoped that, by observing the student as a group member, some light will be thrown on the subject.

Having gained information about the student by these means, it will then be necessary to check the findings against certain criteria. First, it will have to be established that the methods are reliable and consistent. Secondly, the results will be compared with the student's performance in examinations. Thirdly, they will be compared with the personal opinions of students provided by the teaching staff. Finally, in the distant future, it may be possible to follow up the student's career as a doctor, at least for the first year as a houseman—and perhaps beyond.

At the same time an investigation will be made into the nature of the doctor's job. Such a job analysis, which has not yet been attempted, will be a major task, extending far beyond the scope of the present scheme. But a beginning should be made.

One of the most promising lines of inquiry would be into the causes of failure among students.

Waggoner and Zeigler (1946) have drawn attention to this point in a study of 135 failing students at an American university, comparing their performances in various intelligence and psychological tests with those of the successful students. They found that no one test has predictive value, though they think that low intelligence is certainly one factor, and that an intelligence quotient (Binet standard) of less than 130 is a severe handicap to any student, both in medical school and after graduation. Their results suggest that a psychiatric interview, a Rorschach test, and "certain selected psychological studies properly interpreted" would give the information needed for a workable system of selection. So far as can be inferred, however, their tests are of the laboratory type, and no detailed follow-up scheme was carried out. The standard against which they measured success or failure was the examination, which in our present state of knowledge seems of doubtful value.

Objections to the Scheme

After working out a method of selection which is fair, simple, reliable, and valid, there will remain the formidable task of getting it accepted by those concerned—the university, other educational bodies, the applicants, and (not least) the parents of the applicants. Resistance to "scientific" selection would take the form of traditional opposition to any new procedure, and would be coloured by current attitudes towards psychology itself. The first set of resistances need not concern us; for, if there is any value in the new system, it will find its champions. But, because the extension of psychology is viewed with distrust by many informed and earnest thinkers, it may be worth considering the nature of this conflict.

The most consistently voiced objections to modern psychology—especially that of Freud—are that it derives from an impersonal and determinist philosophy, that the doctrine of the unconscious would make of man and his will nothing more than the product of blind chance (or, at least, that man's conscious efforts in deciding his own fate are impotent), and that psycho-analysis (as with all other types of analysis) is always destructive and moving away from truth rather than towards it. The spirit and soul of man, under the critical analysis of modern psychology, disappear; and man is reduced to the level of the animals, with no unique place in the universe. This "sunless philosophy," it is contended, is the very negation of personality, and therefore cannot make any contribution to the study of personality. The objection therefore is that the essential uniqueness of the individual, and the fact that individual personality is experiment, and the first working boards were started in May of the same year.

BOARD STRUCTURE

Each board was presided over by a regular colonel, who was solely responsible for acceptance or rejection. In reaching his decisions the president was helped by a team of workers including a deputy-president (lieut.-colonel), three military testing officers (major and captains), a psychiatrist, and a psychologist. There were also technical and administrative assistants. Each board was therefore a small self-contained unit, and each member a whole-time worker in it. This gave selection a professional status and made for high technical standards. The rôle of the experts was twofold: firstly they were ordinary members of the team, on an equal footing with other members, in giving their opinion; and secondly they acted as expert advisers to the president on technical development. These experts were viewed with suspicion only by those who had no direct acquaintance with their work. When it was discovered by their colleagues, in daily contact with them, that there was no "flowing robe and crystal ball," they were treated as the ordinary human beings they undoubtedly were.

TEST PROCEDURES

The candidates came to the board for three days, in groups varying in number from 60 in the early days to 24 finally. On the first day there were written tests: intelligence tests, questionnaires, and psychological "projection" tests (word-association test and Murray's thematic apperception test). On the remaining days there were interviews by the president or the deputy president and by the psychiatrist or the psychologist, and individual and group tests conducted by the military testing officers.

The interviews were biographical—i.e., concerned with the full life-history of the candidate. The president dealt with school, work, and Army records, and inquired about hobbies and interests; the psychiatrist or the psychologist went into the earlier history and the family history. Matters of physical and mental stability were also explored. Little importance was attached to the impression that the candidate gave as compared with the information he furnished about his life-history. Newcomers to interview technique tend to suppose that the impression given is the most important thing, and rely for their judgments on what was called in W.O.S.B. circles the "magic-eye technique."

Though the word "test" has been used to denote various methods of assessment, it is here used with regret, for want of a better. Most of the procedures are not tests in the usual sense, but real-life (or near real-life) situations which serve as "occasions" for the observation of behaviour. For example, the series of tests known as the "basic series" and originated by Bion (1946) were designed for small groups of 6–8 candidates, and took the form of discussions, planning projects, group tasks, and games. The groups had no set form, were leaderless, and had no rules of procedure to guide them. The aim was that each candidate should be given the chance to behave in the manner most true to his own nature. In the practical task, for instance, the group was asked, as a group, to do a simple job, such as moving a heavy object over a supposedly electrified fence, using only the few "props" provided on the site. The *apparent* task was to finish the job as quickly and dexterously as possible. The *real* task presented to the candidate was to cope with the other members of the group and, at the same time, further his own chances of obtaining a commission. The "test" was therefore a study in interpersonal relationships.

THE FINAL CONFERENCE

At a final conference each candidate was reported on at length by each member of the board, and an attempt was made to piece together all the evidence, to get an over-all picture or "profile." It was only when an agreed "profile" had been fashioned that the final decision, to pass or to fail, was made by the president. This final integration of evidence was in itself a significant social phenomenon, since it implied team-work of a high order, with tolerance and understanding on the part of members to reach agreement. It was as necessary for each member to know himself and his colleagues, their prejudices and scotomata, as it was to know the candidate. And it was vital to the success of the work that each member was as alive to the implications of good contact in his own group as in the candidate group.

It was the aim of the board to get to know as much as possible in the time available about the candidate as a unique person, and then, on the basis of this intimate and comprehensive knowledge, to decide whether his particular personality was likely or not to develop with training into a good officer. There was no theoretical bar to any type of person, were he manual worker or university graduate, provided it was thought that he could do an officer's job, in his own way, successfully.

ASSESSMENTS OF CONFORMITY AND STYLE

The approach to the problem of assessment in the method just described differs from that current in the educational world. This difference may be brought out in the following illustration:

> A pupil has just sat his examination, say in history. His answers are typewritten and then given to someone who knows him well—perhaps his mother. The chances are that she will find difficulty in recognising it as the work of her son. The more successful he is in his answers, the more will they conform to some ideal standard set by his teacher—and the less will his individual efforts be apparent to his mother. Personality is therefore obscured by the achievement of conformity. On the other hand, if he is asked to write freely on any subject in an essay, his uniqueness, or style, will at once become apparent.

In W.O.S.B., as time went on, assessments of style gained more favour and those of conformity less, until a balance was struck. The candidate was encouraged to come out from behind his mask of regimentalism and to r himself as a true person; and it was in the group tests, so brilliantly conceived by Bion, this opportunity was afforded. Observation of spontaneous behaviour of different persons, in a so as against a laboratory setting, was one of the principles of officer selection.

RESULTS OF OFFICER SELECTION

Several follow-up studies were made, successful candidates being followed up at officer cadet training (O.C.T.U.) and later on active service. On the whole, the elaborate procedure of selection was amply justified the quality of officers improved and there was much less wastage at O.C.T.U.

Because the method was so obviously fair and thorough it encouraged men to apply, with the result that supply kept up with demand. Further, much of the information obtained about the individual soldier was put to good use in many ways other than selection. Training methods at O.C.T.U. directly benefited, and new light was thrown on problems of morale and man-management by the researches into the behaviour of groups.

Applications to Medical Education

The experience gained in officer selection can, I suggest, be applied to medical education in three ways—selection, in counselling, and in training.

SELECTION OF MEDICAL STUDENTS

In almost every medical school there are many more (in some cases many times more) applicants than pl evidence would be afforded that the educational aim of the university is as much to further the interests of the student in his pursuit of learning as it is to provide the community with a good product.

CONTRIBUTION TO TRAINING

The modification of training to meet individual needs is a cardinal principle of education, albeit one which is receding before the ever-increasing size of classes and the diminishing ratio of teachers to students. But it is possible that this principle may yet be observed. It is clearly impossible for *all* teachers to know *all* students intimately, but it seems not only possible but very desirable for *some* teachers to know all students intimately. This would happen in a comprehensive selection and counselling service. Much valuable information about the students would be available for all teachers.

It is also possible that information gained about the behaviour of small groups can be applied to the method of teaching. At present the student is taught as a unit in a large class, and mainly on the basis of interpersonal rivalry and competition. Perhaps this method of teaching brings the more antisocial self-seeking "thruster" to the top, whereas it seems more desirable to foster the individual with good contact. It remains to be seen whether the small group can act as the ideal unit of teaching, and whether an awareness of social need is not a greater stimulus to learning than is the personal desire for academic honours.

Since research into selection is essentially an assessment procedure, perhaps some additional methods of assessment throughout the student's undergraduate career may be grafted on the existing examination system, which is known to have its defects.

Conclusions

Advances in the study of personality having been made in many other fields, particularly in the selection of officers in the Army, there is a challenge to the universities to continue the work.

New methods of selection of medical students are urgently needed, and this seems to be the best starting-point for further research.

Because of the social and technical difficulties involved, at least three years' experiment will be needed before a routine procedure of selection is adopted.

It is hoped that this study will contribute information that can be applied to the guidance of students in their undergraduate years and towards their future in the different branches of medicine. Contributions may also be made to methods of training, particularly in the employment of small groups as teaching units wherein motives of rivalry are replaced by those of coöperation as a basis of learning.

My thanks are due to Prof. D. R. MacCalman for valuable advice and criticism.

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Reviews of Books

Widening Horizons in Medical Education

(*A Study of the Teaching of Social and Environmental Factors in Medicine 1945–46.*) Report of the joint committee of the Association of American Medical Colleges and the American Association of Medical Social Workers. New York: Commonwealth Fund. 1948. Pp. 228. $2·75.

How far are the disciplines of the medical schools developing the sociomedical approach in students? The mere technique of training them to relate disease, as seen in the wards, to social and environmental influences is still far from perfect. The joint committee responsible for this report has examined teaching in a large number of American and Canadian medical schools, and paints a varied picture of its findings. Clearly many more experiments have been tried in America than in Britain; but though some date back longer than any of ours, many are still in tentative early stages, and are neither well received nor suitably dovetailed into the curriculum as a whole. But there are some notable exceptions, where clinical teacher and medical social worker act in harmony, and the student gets the chance of seeing good medical social work, undertaking case-work, and making home visits, so getting to know the patient and his family over a long time. At worst, he gets the advice that "certain local organisations exist which the patient may contact"—a dismal travesty of the teaching of social medicine. Sociomedical teaching is sometimes carried out by the clinical departments, sometimes by the department of hygiene and public health.

The report is concerned almost entirely with social medicine as it applies to the sick person and his family: an extension of diagnosis and care for which the medical social worker is responsible; and indeed the last chapter in the report—on the rôle of the social worker in medical treatment—is the best.

In the U.S.A. the current idea of social medicine still centres in the care and aftercare of the hospital patient, and the costs of such care, and thus reflects the prevailing individualism of America culture. The report, though dealing specifically with social and environmental factors, has little to say of the bearing of social medicine and pathology on the community as a whole or on selected groups. Inevitably, then, teaching is incomplete, and studies are confined to attempts to repair damage which is often far advanced, and which is in itself evidence of a failure in social medicine. Sickness in the individual and the family again and again reflects wider problems of disease which can be examined more rewardingly by complementary statistical studies—medical, social, environmental, and occupational—and by more intimate investigations of people's response to work and economic opportunity. These throw light on the origins of diseases and suggest ways of reducing or preventing them. The narrower American approach is perhaps reflected in some rather diffuse social case-reports by students, quoted in the text. As the writers of the report themselves suggest, the findings of social medicine, like those of clinical medicine, need to be accurately presented and interpreted with judgment.

Cardiovascular Studies

K. J. FRANKLIN, D.M., F.R.C.P., professor of physiology, St. Bartholomew's Medical College, London. Oxford: Blackwell Scientific Publications. 1948. Pp. 306. 42*s*.

WE hear much nowadays about the synoptic approach to teaching, but it is usually taken for granted that research implies specialisation; indeed, many research-workers would lift an eyebrow if they were asked to be a little more synoptic in their approach to the unknown. Not once, but several times, Professor Franklin, either alone or as a member of a team, has given us works which may have owed their inception to interest in a technique, but which in their maturity display the subject under review in the broadest possible light. Its history is carefully recorded, and no distinction is recognised between anatomy and physiology; evidence of every kind is given its full weight. The present book is about the eustachian valve and the intervenous tubercle of an end in itself (and not simply a means or a product), are not respected.

There are also critics within the psychological camp. Bertocci (1946) says:

> "The inviting 'mask' of personality has indeed brought many suitors, in the name of common-sense, the arts, religion, philosophy, biology, mathematics, sociology, physics and, finally, 'scientific methodology.' But none of the suitors has won her, for they have sought to ensnare her by their formulæ rather than respect her for her many-sided 'uniqueness.'"

This uniqueness of personality is also referred to by Sherrington (1947):

> "This self is a unity. The continuity of its presence in time, sometimes hardly broken by sleep, its inalienable 'interiority' in (sensual) space, its consistency of viewpoint, the privacy of its experience, combine to give it status as a unique existence. Although multiple aspects characterise it, it has self-cohesion. It regards itself as one, others treat it as one. It is addressed as one, by a name to which it answers. The Law and the State schedule it as one. It and they identify it with a body which is considered by it and them to belong to it integrally. In short, unchallenged and unargued, conviction assumes it to be one. The logic of grammar endorses this by a pronoun in the singular. All its diversity is merged in oneness."

Bertocci also says:

> ". . . the central feature of personality is the knowing-wanting *unitas multiplex*. The personality is not the product of an ambiguous field of forces, but represents what a given unique self has created out of the forces and opportunities open to it in its *rapport* with the world."

It seems clear that these views will have to be endorsed by those carrying out any investigation of personality; and, though the individual may become the object of minute and unprecedented scrutiny, it should be recognised that he does not thereby lose his identity in a series of abstract formulæ. Since it is for the sake of the individual that the procedure of selection is created, it would be absurd to suppose that in the process the individual disappeared and only the method remained. That individual personality is a stubborn entity and will resist all threats, physical and psychological, to destroy it, is emphasised by Zilboorg (1939). Writing as a psycho-analyst he points out that, since almost every individual is convinced of his immortality and his personal freedom of choice, these convictions must be respected.

If, as a result of a deep inquiry into personality, some prejudices are attacked, some myths exploded, and some convictions questioned it will not be a threat to the individual but a service to him.

Who Shall Select the Selectors?

I have already indicated that the selectors should be representative of the university as a whole, presided over by the dean. The selectors would therefore be precisely those people who are at present responsible for selection, and who have acquired their authority by the very practical method of usage. It will be the responsibility of the president to sift the evidence and make his decisions accordingly. It will be for him to say—and for a follow-up to show—that the evidence on which he has based his decisions is more or less reliable and valid than former evidence based almost wholly upon academic success. The method of selection here advocated is an addition to, and not a replacement of, existing academic methods.

Will Elaborate Selection not Reduce Variety?

In any selection procedure it must be true that the fewer the criteria of acceptance the greater will be the variety among those accepted. Conversely, the more detailed and rigid the criteria the more will those accepted conform to a type. It is claimed that the criterion present in use—academic success—has the advanta simplicity and thus ensures that a wide variety personalities, so necessary for medicine, is acce According to this view modern elaborate methods wo reduce this variety and create stereotypes. This criticism was levelled at W.O.S.B. It was suggested, example, that a man like Lawrence of Arabia would failed at a W.O.S.B. because he could not be fitted any of the known categories. But these criticisms out of a mistaken view of selection. They are in relation to conformity assessments; but, as has shown, the individual style of the candidate is assessed. Lawrence would have immediately displayed himself at a W.O.S.B. as an exceptional person and obvious leader in many of the test situations. Wh a simple examination would merely record that he an outstanding intellect, the W.O.S.B. procedure would be able to add much more about his personality as whole. And this enriched picture would conduce a better kind of choice than would be the case with written examination alone.

At any rate the question remains open, and will doubt be answered with more certainty at the end of the experimental period.

COUNSELLING

The idea of a student advisory service is not new. Most arts faculties have their advisers of studies, and the introduction of the student health service into some universities has afforded the student further opportunities for bringing his problems to a member of the staff for solution. But of the intimate emotional problems which beset every student at some time in his career—in relation to failure, to altered circumstances at home, to his loves and hates—we know almost nothing. Some of the more severely maladjusted are referred to the department of psychological medicine. Other students report of their own accord. It can, however, be inferred from the scanty information available that a problem great magnitude exists, of which we are h aware.

A hint that all is not well is shrewdly given by M (1947) in his review of the student health service in Aberd "conditions which students make for themselves can be depressing, both mentally and physically." He refers to banks of examinations," abandonment of physical late hours of working, bad landladies, poor food, and stringency as having a bad effect on the student's He emphasises the need for "clear sound advice" in rel to exercise, rest, relaxation, vacations, sexual disturban and the like, and of "just letting the student himself."

A high incidence of anxiety among students was found Parnell (1947) in a pilot survey of 155 students of either at Oxford. Mayer-Gross (1948), commenting on the figur given, estimates that emotional disturbances were present half of those examined.

In American universities the same problem is being encountered, and departments of psychology and psychiatry devoting much time to the counselling of students in di culties. Blos (1946), Rogers (1946), Combs (1946), and other have described the technique of "non-directive therapy" dealing with the problem. *This is little more than a* skilful handling of the situation Macklin has described "letting the student unburden himself." In talking free about himself and his problems he is guided towards a solution of his own choosing, and by objectifying his conflicts better able to deal with them, to gain a clearer emoti insight, and to adopt new and more satisfactory attitud life.

In the proposed scheme of research at Aberdeen it expected that much will be learned of the nature variety of students' problems. The results may indic a more urgent need for the establishment of a counsell service than has hitherto bec cted. Thus tang

THE LANCET

LONDON: SATURDAY, AUGUST 28, 1948

Selected Seed

To get a good crop of doctors one needs not only od soil and good cultivation but also good seed. the past few years much has been written on the ltivation of the medical student, and some compre nsive horticultural directions have lately come from e British Medical Association.[1] Relatively little, wever, has been said about the selection of the ed that is to be cultivated, and we have therefore osen this as the main subject of our educational mber for 1948. The information and papers we ve collected show that in fact a good deal of thought at last being given to the fundamental question how to select the right students for medicine. ormerly there was less need, for the students mostly lected themselves: the number of applicants was tle more than the medical schools could hold, and e authorities had no more to do than reject the bviously unsuitable. Now, on the other hand, the pplicants are so many that the selectors have creasingly a positive rather than a negative task; stead of excluding losers they have to pick winners, hich is far harder. Must they still rely on academic ests, school records, and personal impressions, or re there any useful new methods of assessing young eople's capabilities?

Before thinking about methods of discovering ualities, we ought surely to know what kind of ualities we seek. What are the ones that make a ood doctor? High intelligence perhaps? But some aluable doctors have had only just enough intelligence o pass their qualifying examinations. Acuity of bservation? But observation varies with interest, which cannot be judged before training is begun. Specific aptitude for medicine? But psychologists ssure us that aptitude can be confidently identified only in respect of basically different functions such as mathematics and manual dexterity. Sense of vocation? But in the applicant of, say, 17, whose interests and personality are not fully moulded, this is often fleeting. (We are told that at this age about half the applicants intend to become surgeons, while the other half want to be psychiatrists!) The truth is that, since a doctor may pursue any of a score of different careers within medicine, no single answer to our question can be found: for which we should perhaps be thankful, since it would certainly be disastrous if the profession were all of a type. Medicine in fact defies the job-analysis which in other fields is deemed essential to rational selection: and it follows that in the choice of medical students progress can come only from empirical studies. But this empiricism is no excuse for mere adherence to the status quo, particularly as the efficiency of existing methods, apart from impressions, is unknown.

Everyone agrees that certain minimum standards of general education and intelligence should be required; and these have usually been gauged by examinations taken at school. Besides offering a rough guide to intellectual accomplishment the results indicate whether the student is likely to get over the similar hurdles he will meet in his medical career. On the other hand, by themselves examinations can be an unsteady guide. In a debate in the House of Lords last May, Lord **Elton**[2] declared:

> "So far as the traditional examination goes . . . the successful candidate need possess neither common sense nor common honesty, neither courage nor adequate physique, nor even an original mind. It is the kind of examination in which Shakespeare and Cromwell, and almost certainly Mr. Winston Churchill, would have ignominiously failed. For in early years the possession of a strong character or original mind only too often serves as a sort of non-conductor for the ideas of other people . . ."

Recognising the deficiencies of the school examination in measuring ability, some universities are beginning to turn to intelligence tests for supplementary information. With such tests random marking is eliminated and a quick answer is obtained: and though it may not always be the right answer the work of **Eysenck**[3] and others indicates that a higher correlation of assessment with performance is achieved by considering the results of examinations and intelligence tests together than by relying on either singly. Investigations now proceeding, some of which are described in this issue, may bring to light a group of tests more consistently reliable than any at present employed.

A great deal more than intelligence goes to the making of a good doctor; and the student who by average standards is insufficiently intelligent may, if stable and determined, not only succeed in qualifying but become a better doctor than his brighter unstable friend. In the final analysis, therefore, examination results and intelligence tests do not fully prove a candidate's suitability or unsuitability, which can be judged only with knowledge of his character, temperament, and personality. On a later page we review some of the methods now used for such judgment, while in another article Dr. **Millar** tells of a proposal at Aberdeen to obtain a fuller picture of character and capabilities through adaptation of the War Office Selection Board procedure. Though their methods may not prove to be applicable, both W.O.S.B. and the National Institute of Industrial Psychology, which has pioneered selection for industry, can offer useful experience to the medical selector. For example, comparison of the initial W.O.S.B. assessment with subsequent performance during training shows that, while the procedure can be valid, validity varies between the different boards. Though based on scientific principles, it cannot be entirely independent of the people operating it—a fact evident also at medical schools. It benefits from the help of the few who have a flair for their task, but the possession of this flair can be proved only by cold statistics; and there is merit in the W.O.S.B. practice of checking individual selectors' assessment against the candidates' later performance.

At every stage the need is for more facts; and until validation is obtained the advocate of one system is in no position to decry another. The more

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[1] Training of a Doctor: Report of the Medical Curriculum Committee of the British Medical Association. London, 1948. See *Lancet*, 1948, i, 833, 839.

[2] House of Lords: Official Report, May 26, col. 1054.

[3] Eysenck, H. J. *Brit. J. educ. Psychol.* 1947, 17, 20.

Lower, and comprises a review of ancient and modern knowledge on the subject together with a completely documented account of the author's researches, both by dissection and cineradiography, on hearts from about 200 specimens of all types of mammal. His conclusion is that the shape and size of the eustachian valve are determined by the interaction of the currents of blood during development, but the information given is so complete and interesting for its own sake that the actual conclusion does not seem to matter greatly. We should perhaps explain that about three-quarters of the book is devoted to records which, while individually interesting, will be completely read only by the few. Many, however, will wish to have this scholarly work on their shelves for the sake of the uniqueness of its text and the range of its bibliography.

Surgical Pathology of the Mouth

E. WILFRED FISH, M.D., L.D.S. Manc., D.D.SC. Melb., D.SC. Lond., F.D.S. R.C.S., dental surgeon, St. Mary's Hospital, London. London: Pitman. 1948. Pp. 463. 50*s*.

Mr. Fish's researches are well known, and most of this book is founded on original work. He remarks that "the first chapter is not even very much concerned with pathology, for it seemed necessary to review the biological status of the dental tissues, which are highly specialised and have perhaps received rather scant attention at the hands of physiologists and biochemists." Dental research in the past has indeed received too little attention, and much empiricism has crept in. Whether it would be wise to initiate students with applied dental pathology instead of general pathology is a moot point, but the book should certainly be read by all dental students at some stage in their syllabus, and by all practitioners. The exposition is clear, and is the more lively because the opinions expressed are often personal.

Practice of Industrial Medicine

T. A. LLOYD DAVIES, M.D. Lond., M.R.C.P., chief medical officer, Boots Pure Drug Co., Nottingham; with a chapter on the *Hazards of Coal Mining* by G. F. KEATINGE, M.D. Dubl., D.I.H., medical officer, Butterley Co., Ripley, Derbyshire. London: J. & A. Churchill. 1948. Pp. 244. 15*s*.

THIS book has two outstanding features—its remarkably high content of information and its strong flavour of what is now called social medicine. Dr. Lloyd Davies has managed to infuse into its pages his vigorous and stimulating personality, with his intense concern for the welfare of the factory worker, particularly of the young worker. His understanding of the historical and immediate aspects of social problems is conveyed mainly in the historical survey and in a separate chapter entitled the Social Functions of Industry. These two chapters, at least, should be read by all those interested in social and occupational medicine. He pays tribute to the men of all classes, such as Lord Shaftesbury, Attwood the banker, Fielden the mill owner, Oastler the land agent, Jones the barrister, and many others such as Southwood Smith, Chadwick, Farr, and Engels, who studied the industrial and social conditions of their times and roused the public conscience against the evils created by industry. If anything, he understates the part played by the long line of doctors who acted as an antidote against the social poisons of the Industrial Revolution. Praise is given to the factory inspectorate and due weight to the courage and vision of the four original inspectors—Horner, Howell, Rickards, and Saunders—who "not only laid the foundation of our present system of factory inspection but also exerted a lasting influence on the development of education." (Even in 1833 they were thought to be worth £1000 a year!)

Industrial diseases and toxicology take up about half the book, the descriptions being well documented with up-to-date references and emphasis being laid on prevention and practical treatment. The psychological causes of disease in industry receive attention; the legal aspects are not ignored; and full discussion is given to accidents, fatigue, and environment. Among other things, a works doctor will obtain much information on the proper running of a factory medical service and the salient points about compensation and reablement. The causes of strikes are ably analysed, but one misses a companion piece about lockouts. The book is a valuable one if only for the fact that Dr. Lloyd Davies has not hesitated, as he says in his preface, to add his own opinions to the information gained from the writings and experience of others. And his own opinions are entertaining and provocative.

A Handbook of Ophthalmology (6th ed. London: J. & A. Churchill. 1948. Pp. 336. 21*s*.).—Mr. Humphrey Neame and Mr. Williamson-Noble have not changed the general form of their book but have made some additions and corrections. The use of penicillin in conjunctivitis has been included, while Ballantyne's work on retinal changes in diabetes and the formation of micro-aneurysms indistinguishable from hæmorrhages to the ophthalmoscope is briefly recorded. New work on the effect of drugs on the pupil describes the mode of action of atropine, homatropine, and adrenaline. (The statement that the latter has "little effect as drops" does not hold good if the drops are 1 or 2%.) The volume is handy in size and well produced. It provides students with a precise and accurate account of eye diseases and practitioners with a good description of recent [illegible] and discoveries.

Clinical Diagnosis by Laboratory Methods (11th ed. London and Philadelphia: W. B. Saunders. 1948. Pp. 954. 37*s*. 6*d*.).—The 11th edition of this textbook by Prof. J. Campbell Todd and Prof. A. H. Sanford covers a wide field, and it will remain one of the first works of reference on clinical pathology. The authors still prefer the old-established tests for renal function—such as the phenolsulphonphthalein excretion, Mosenthal's test meal, and the concentration and dilution tests—to the more modern inulin and diodone clearances. The chapter on blood is particularly well illustrated, including coloured diagrams. Rh blood types, cross-matching, blood groups, and heredity are fully described. Over 100 pages are devoted to clinical chemistry, including details of laboratory methods for estimating vitamins, hormones, drugs, and toxic substances in blood, enzymes, and the like. Only brief mention is made of streptomycin. Each chapter contains adequate references, and the book is well indexed.

An Index of Treatment (13th ed. Bristol: J. Wright. 1948. Pp. 984. 84*s*.).—Sir Robert Hutchison and Dr. Reginald Hilton must have had an unusually difficult task, in this edition, to keep pace with the rapid increase in knowledge of therapeutics—a task made more difficult by the problem of what not to include. To cover the whole range of medical, surgical, and gynæcological treatment in less than 1000 pages is an achievement, and to have squeezed in all that is now of practical importance to the busy general practitioner is still more remarkable. Contributors have gallantly pruned their articles, leaving only the clear essentials and precise practical instructions. Little space is given to general and theoretical considerations, except perhaps in articles such as that on medical reablement. One of the most pleasant characteristics of the book is the lucid English in which it is written. It is helpful, too, to have a clear emphasis given to the reader when there is a choice of alternative treatments. Nothing but praise can be given to editors and authors alike for a book of the utmost value and the highest authority.

An Atlas of Anatomy (2nd ed. London: Baillière. 1948. Pp. 496. 55*s*.).—The second edition of Mr. J. C. Boileau Grant's Atlas includes 200 new illustrations. Monochrome provides the background in most, but colour is used judiciously to draw attention to necessary detail. The illustrations are of the cadaver, and the student will have no difficulty in identifying the structures he is dissecting. Perhaps some representation of the viscera in the position they commonly occupy during life might have been useful in correcting the misleading picture derived from their situation in the preserved body. Abnormalities should be clearly labelled as such in the figures, lest the student, not reading the text in detail, be misled; and a semi-diagrammatic representation of the autonomic nervous system as a whole might have been useful—but these are minor points. The book, costly though it is, should add considerably to the student's pleasure in the study of anatomy.

ad "failure to apply such discrimination to home-roduced books is not only inconsistent, but favours rtain sectional interests at the expense of the nation s a whole."

FILMS FOR DOCTORS

Last year three-quarters of the general practitioners n this country saw a 20-minute film reminding them of ome points in the diagnosis of poliomyelitis. Doctors ppreciate the merits of the medical film, and the cientific Film Association has helped by compiling a amphlet on the organisation of programmes[1]; but nfortunately few new medical films are being made here. his year the Ministry of Health has issued a further one n poliomyelitis and another on patent ductus arteriosus: hile the British Council are finishing, for use overseas, lms on artificial pneumothorax and on bronchography. he Central Film Library holds the largest collection of odern medical films in Britain; and yet it contains nly eleven besides the well-known series on anæsthesia ade for Imperial Chemical Industries.

Expense need be no bar to greater production. The ost of last year's poliomyelitis film was equal to 10*d.* er head of those who saw it within a month of its ompletion; and, for an annual allocation of 5*s.* each, eneral practitioners could have five similar films every ear, on such subjects perhaps as the management of heumatoid arthritis in the home, the early diagnosis of cute appendicitis, breast-feeding, and the treatment f septic hands. Experience has already proved that olour and animation, though raising the cost, are often ssential; but whether the duration should preferably e 20 minutes or, more ambitiously, a full hour is not et certain. What is certain is that each film must be esigned for a specific audience, whether of practitioners r of specialists in training; and if a useful series is to e built up over the years there must be a long-term rogramme guided by a central agency such as the inistry of Health or the Postgraduate Medical Federa-ion. (The Scientific Film Association has already ubmitted to the Ministry a five-year programme for lms on health education.)

The immediate need could be met if the Central Film ibrary were enabled to obtain more films from over-eas. At present this library is empowered to acquire or all its sections only twenty films a year, though for he cost of the Ministry of Health's latest film on polio-yelitis it could get multiple copies of a hundred films rom abroad. The excellence of some of these was emonstrated this month at the International Congress n Mental Health. Even twenty-five films from the large tocks in North America would provide much stimulating material. The £1500 needed for this purpose does not seem too much to spend on the instruction of 20,000 practitioners.

THE EPILEPTIC AT COLLEGE

"For the epileptic, hindrances to climbing the educational ladder increase with its height." Discussing this text, Lennox, McBribe, and Potter[2] note that in the U.S.A. epileptics now receiving a college education are only a tenth of the proportionate number in the adult population. A questionary sent to 1676 colleges produced replies from 79%. Asked whether they had any rule about the admission or refusal of epileptics, 55% of those replying said they had no rule; 27% admitted epileptics conditionally and 18% refused them. All military colleges refused them, which means (Dr. Lennox and his colleagues point out) that they would reject such military leaders as Julius Cæsar, Peter the Great, and possibly Napoleon. Roman Catholic seminaries reject them because a canon of the church requires it, perhaps because of the old belief that epilepsy meant demoniac possession. In general the smaller the college the greater the reluctance to accept epileptics: 40% of colleges with more than 2500 students take them, but only 14% of colleges with less than 100. The number of epileptics per 1000 students in the colleges studied was 0·48, which makes a total of 480–500 (allowing for unrecognised cases) in American colleges and universities. Four reasons for this small (by American standards) enrolment are considered: colleges may be rejecting epileptics as a general policy; or epileptics as a class may be below the necessary standard in intelligence, personality, or means; or their attacks may be severe and frequent; or some may have taken a chance and succeeded in concealing their condition from the authorities. The writers of the article hold that the intelligence of epileptics not segregated in institutions is mainly good and often above the average; and they believe there is no distinctive "epileptic personality" among intelligent epileptics. Severe and frequent fits must necessarily debar an epileptic from a college career; but thanks to better drugs and more accurate assessment by means of the electro-encephalograph, epilepsy is becoming a controllable disorder in many cases. The college, they suggest, needs to be assured of three things about an epileptic: that he requires education, that he can and will profit by it, and that he will not be too great a responsibility for the administration. The third is the only one likely to present difficulties.

MENTAL HEALTH: INTERNATIONAL AND DOMESTIC

> *"There is already a world community, at least in embryo. There are already world citizens. . . ."*

The Preparatory Commission[1] appointed to make ready the way for the International Congress of Mental Health, having considered the group studies of mental-health problems sent from 27 countries, see the world as a unit in the sense that events in one country have repercussions in all, that the food-supply in producer countries affects consumer countries, and that nations depend on one another for raw materials and manufactured goods. In their statement they discuss the hesitant steps mankind has taken towards forming a world community: joint action over famine and disease, trade and shipping conventions, a postal union, and scientific and cultural exchanges were all in being before the 1914–18 war; and between the wars which divide peoples other factors were at work to draw them closer together—easier transport, radio, and the deliberate creation of world institutions, some of which are now several generations old. The United Nations' special agencies, such as the Food and Agriculture Organisation, the Educational, Scientific and Cultural Organisation, the World Health Organisation, and the International Labour Organisation are well established. A body of "world servants" are growing up who combine nationality with a wider loyalty; a growing number of scientists and writers have a "world *outlook.*" Whether or not this view is too optimistic, progress towards world citizenship is one of the *most* promising auguries of world peace and should be fostered. The sessions of the congress ended appropriately with the formation of a World Federation for Mental Health, which will have offices at Geneva and will collaborate closely with W.H.O. About 150 of the delegates to the congress from 42 countries were responsible for forming this body, which is however interprofessional rather than international. Dr. J. R. Rees, elected the first president of the federation, explained that membership will be open, not to countries or individuals, but to societies and bodies whose complex the job, the longer validation takes; and universities may perhaps decide that the best hope of speedy progress lies in continuing with their present techniques, at the same time adopting an alternative either as a "shadow" method or for the selection of, perhaps, half their students. One valuable function of the Medical Research Council's committee on selection would be the integration of reports from each centre. In this study special attention will no doubt be given to the student who fails to qualify; plainly, his failure is less commonly a reproach to himself than to the system which allowed him to start training, and it is the concern of every selector to find out how the failure might have been predic Similarly, it may prove possible to follow up applicants who have been rejected, and particularly those who afterwards accepted by another medical school; all they know, the schools may now be rejecting some of their best candidates. With many questions still unanswered, one thing is clear: in the future, as in the past, each university must be free to ch its students according to its lights; but protecti of this right should not prevent them from help themselves, and each other, to find out whether t are really getting the students they want. Is their seed the best on the market?

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[1] Notes for the Secretaries of Medical Societies on Organising Medical Film Programmes. Issued by the Scientific Film Association, 34, Soho Square, London, W.1. Pp. 11. 1s.

[2] Lennox, W. G., McBribe, M., Potter, G. *Epilepsia*, 1947, 3, 182.

[1] Statement by the International Preparatory Commission. Published by the International Congress on Mental Health, August, 1948. Pp. 44. And see *Lancet*, Aug. 21, p. 298.

OUT OF PRINT

UNDERGRADUATES need no reminder of the book shortage; to them this is a recurring obstacle that has somehow to be overcome each time they enter a fresh field of study. The extent of their difficulties is reflected in a report from the Association of Scientific Workers.[1] Last spring the association's Cambridge branch made a survey to find out what proportion of books recommended by university science teachers could be had from booksellers, and to what extent the shortage was affecting the demand for American books. Sometimes any of several books are recommended; so the investigators first grouped recommended books under topics, counting the topic as covered if any one of the recommended books was obtainable. They found that no recommended book (whether British or American) was to be had in almost half—44% to be exact—of the 128 topics about which inquiry was made; and, commenting on the present-day student's tendency to cling to books once he has them, they deny that the second-hand market provides any major relief.

There is nothing new about this impoverishment. Originating in the war, it has been accentuated by a number of post-war influences, which we enumerated last year.[2] Commonly the deficiency is attributed to insufficient supplies of paper; actually, it is due rather to over-all incapacity of the printing and associated trades to deal with the demand, which could be met only by reorganisation, with further trained workers and enhanced supplies, including more glue and binding materials. The U.S.A., less embarrassed by these impediments, is naturally bent on filling the gap; and the measure of her success is the growth in the proportion of American books among those recommended at Cambridge from about 10% in 1939 to about 33% at the present time. As with British books, not all the American ones are to be had, for the import of "learned, scientific, and technical books in English" is restricted to 200% of pre-war value; as the actual number of American books ordered has doubled since 1939 and their price has risen by half, the current demand is about 300% by value of pre-war, and thus about two-thirds of the American books required are obtainable. This is still a higher proportion than that for British works, which in the Cambridge study was only just over half (56%). The report acknowledges that the U.S.A., with her large industrial and scientific activity generally, has a greater number and variety of specially qualified authors; and there is no suitable British alternative for many of her scientific and technological works of reference. There are, however, other reasons for the paucity of new British advanced works. In this country authors are placed at a disadvantage by delays in publication, whereby a new American book may sati the demand while its British counterpart is still with publisher; and additional deterrents are lack of time of financial inducement. At the universities incre teaching pressure leaves little time for writing new b and makes it difficult for those who during the war f behind with their reading to catch up. As to finan inducement, publishers try to divide their inadequate resources equally among authors; and small impressions for all mean small royalties for all. With the aim of minimising these handicaps, the report proposes that the Government and universities should—like some industrial undertakings—make special provision for reading and writing, perhaps in the form of sabbatical years; and with important books Government subsidies, it is suggested, might make up for the smallness of royalties.

Home requirements are not the only reason for fostering new works. By her books Britain has earned abroad a great reputation, which on economic and other grounds must be maintained and expanded. Nowadays, to get an average-size page of a textbook set in type costs about £1; and this high cost is reflected in the eventual price of the book. If more books were distributed overseas, the expense of type-setting would be more widely distributed and thus the price of the book could be reduced. There is also the further point that, for the cost of manufacture, books yield a higher profit abroad than almost any other article. Moreover, overseas book sales promote trade in other directions; a country which buys its medical books from Britain will also tend to look to this country for pharmaceutical supplies. Less tangibly, books take an important part in linking the country of their origin with the place where they are read. On each of these scores we should applaud the association's restraint in refusing to recommend that the allocation of books for foreign markets should be impaired for the sake of better supplies at home. At the same time we should recognise the extent to which the shortage in this country derives from determination to sell overseas. The report quotes figures showing that of all books produced here in 1947, valued at over £30 million, 24·5% was exported.[3] No separate figures for scientific works are given; but the case of a well-known work on bacteriology is cited: 6000 copies of this have lately been printed, and of these 4500 were exported; after a two-year wait a Cambridge bookseller, who had ordered 150, received only 5.

As to a remedy, the report is unequivocal: in the absence of a general increase in book production there should be discrimination in favour of "learned, scientific, and technical books." This claim has often been advanced,[2] and has equally often met with the retort, notably from some branches of the trade, that accession to it would amount to censorship. But, as the report points out, discrimination is already exercised in the preference accorded to imported books of learning;

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[1] A Survey of the Shortage of Scientific Textbooks in Cambridge. Issued by the Association of Scientific Workers, 15, Half Moon Street, Piccadilly, London, W.1.

[2] Leading article, *Lancet*, 1947, ii, 471.

[3] *Bookseller*, March 20, 1948.

STUDENT SELECTION: PRACTICE AND PRECEPT

How do medical schools decide which students to accept? What are their principles and what is their practice? r the following information we are indebted to many helpful donors.

DEANS and other members of academic and administra- e staffs spend much of their time in assessing the ims of would-be students. Their task has lately come harder than ever. For the coming academic ar one London school has had about 700 applications : 65 places, another 600 for 100 places, and a third 0 for 20 places. A provincial university has had 20 applications for 100 places.

Some think that the present surge of candidates will on subside: after the first world war the number of gistered entrants rose sharply in 1919 to a peak of 20 (see p. 354): but by 1923 it had fallen to 545. So r. however. there are few signs of a reduction in plications and there are grounds for believing that the essure will not diminish materially within the next w years. The number of entrants to medicine tends vary inversely with the nation's prosperity, for in mes of economic uncertainty parents regard medical aining as a good investment for their children. Further- ore, the financial bar to a university education has en largely removed, and a growing number of candidates e seeking places in the medical schools with promises State or local scholarships.

NEW EMPHASIS

The large increase in numbers has not only increased ut also complicated the work of selection. Just as there little difficulty in identifying, at one end of the scale, he excellent candidate with strong claims to a place, is comparatively easy to detect, at the other end of he scale, a few who are unlikely to succeed in a medical areer; and before the late war the task of selectors was imply to cut off this "tail." But now, the problem is o decide not who shall be excluded but who shall be ccepted. The question "Is there any good reason for ejection?" has given way to "Is there any good eason for acceptance?" and the dividing line has omehow to be drawn through the mass of "average" andidates who would formerly have been admitted ithout qualm. Selection procedures have thus to be udged primarily in the light of their capacity for sorting ut the best in this homogeneous group.

VARIOUS METHODS

Methods vary widely. All universities require candi- lates first to complete application forms or questionaries, ometimes also calling for photographs; and a confiden- ial report is then obtained from the headmaster or employer. The information gathered in these ways is used for one of the following purposes:

1. Final selection. This practice is almost extinct.
2. Primary selection, final selection being by interview.
3. Primary selection, in conjunction with the results of a screening test. Final selection is by interview.
4. The information of interviewers. All candidates are interviewed.

Oxford and Cambridge have their own methods of selection, based on examination and informal interview by the college to which the candidate has applied.

APPLICATION FORM

The application form gives indispensable information about nationality, age, domicile, academic record, and non-academic achievements.

Nationality.—The universities are so fully occupied with training students born in the United Kingdom that andidates from overseas, whether from the Dominions r Colonies or from foreign countries, can seldom be given a place. At more than one university, however, a small quota of overseas students is deliberately accepted for the sake of their broadening influence.

Age.—Regulations often allow admission about the 17th birthday; but most schools prefer students to enter about their 18th birthday. The maturity, application, and resourcefulness of most ex-Service students demobilised at the end of the war have been taken as an argument for imposing a break between school and university. Clearly there are advantages in a break,[1] for it enables the student to stand back and consider where his interest lies, and in this way it eases the selectors' task. On the other hand the men who returned from the war to the study of medicine are a specially selected group, since only those with resource and genuine interest would contemplate further academic training after a break of up to six or seven years. Many are married and acutely aware of the need to qualify and start earning a living. Today, three years after the war, the quality of ex-Service students is tending to fall and that of schoolboy applicants to rise; and since service is now being reduced to twelve months some schools think they should no longer be obliged to reserve up to 80% of places for men from the Forces.

Domicile.—Unless they could live at home, some students would have difficulty in meeting the costs of training, and provincial universities therefore give preference to candidates living in the immediate neighbourhood. This bias in favour of local candidates is often favoured by the fact that the university is supported from local resources. The merit of this system is that the university establishes close understanding with the local schools, which supply most of the students: the principal drawback is that students are denied the opportunity of mixing with others from different parts.

Academic record.—Selectors often find it hard to judge the candidate's recent academic achievements, since the school certificate has been taken some two years before application, while the result of the higher school certificate examination may not be known until a month or so before the academic year begins.

This difficulty will be largely overcome with the introduction, after 1950, of the general certificate, the examination for which will be held after the 16th birthday, and at Easter. In one way, however, this new examination will impose a fresh burden on selectors; for in it all subjects are to be optional. The present requirements, by which a pass is needed in at least one subject in each of several groups, may sometimes operate unfairly against the brilliant but erratic: yet it is a fair guide to general intelligence. The new practice offers promise of success to the boy or girl who excels at, say, mathematics but is useless in other fields; and selectors will thus have to scrutinise and interpret results with even greater care than now.

Some medical schools are guided by the rule-of-thumb that candidates who have not gained matriculation by their 17th birthday are unlikely to succeed in the professional examinations. Though sometimes a moderately good pointer, this rule makes no allowance for the boy or girl who, seeing no need for haste, defers completion of the matriculation examination; nor for the one who has had a long illness, or has been badly taught, or (as sometimes happens with people who later succeed) has been simply idle. At the opposite pole is the tragic group of students—possibly identifiable by intelligence tests—who, having succeeded in early examinations, fail at the university. Commonly it is supposed that, through being overpressed at school, these students reach the university intellectually spent; but perhaps a more likely explanation is that their intellect has fully developed earlier than that of their compeers.

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1. *Lancet*, 1947, i, 375.

purpose is the promotion of mental health and human relations.

Dr. Rees complained that the federation was at present overweighted with psychiatrists; and indeed this imbalance has affected the congress too. Men and women in many other professions—teachers, clergy, social workers, probation officers, lawyers, and others—must contribute to the study of the mind and its needs and purposes. Teachers of children are especially important, not only because of the facts about mental development which they can contribute but because they stand in such an intimate and important relation to the growing child, and are capable of influencing greatly the standards of every new generation. Miss Isabel Laird, who spoke in the session on planning for mental health, deprecated the fact that the preparatory commission sat without the help or advice of a single teacher of normal children, and that none of the delegates at the congress, so far as she knew, was a practising teacher. Yet it is surely on studies of the normal child that a sound mental-health programme must be founded; for a mentally healthy community is a product of the good upbringing *of normal children. She wished to see better* selection of entrants for primary-school teaching, more opportunities for mature men and women from other occupations to enter teaching, greater chances for teachers who proved unfitted to teaching, or to whom it was uncongenial, to change their calling, and regional staff colleges at which teachers could meet each other and members of other professions to hear and exchange modern ideas about children.

Such practical suggestions, which at first sight may seem to be among the small fry netted at a congress of this kind, are in fact among the big fish in the catch. Mental health and ill health have their beginnings in infancy; and though the cradle need no longer be considered a cumbersome snailshell which we are doomed to carry through life, it is certainly a dangerous refuge in which to lurk too long. Good care from parents later, and good schooling in a liberal tradition, can help us to outgrow some of our earliest mistakes, as other speakers at the congress showed. World health, whether mental or physical, is built on a sound programme of national and ultimately on domestic health.

In summing up the session Dr. George Stevenson, medical director of the American Committee for Mental Hygiene, discussed his ideas on the origins and development of such a programme—ideas set out more fully in a paper published at the congress. His experience of some fifty different States has made him well aware that even within one country there are variations in the background of law and culture which dictate different types of planning. In the very first stage, when ways and means are still to be considered, plans will differ with the authority establishing them. In the United States, governmental responsibility lies theoretically with the citizen; but in some States the citizens see the government as a separate entity from themselves and expect it to be responsible for such things as mental-health schemes. Elsewhere, interested citizens may take the initiative. In either case, citizens who attach importance to mental health will be called together: some—like doctors, clergy, social workers, judges, teachers, and nurses—because of their professional interest, others because an acute personal experience of mental illness in their families has roused their desire to prevent the same misfortune for others. Sooner or later this interested group must survey existing arrangements and plan for their improvement.

It is inevitable and right that their attention should be directed at the outset to the care of the mentally ill and everywhere they will find scope for great advances. "Presumably," Dr. Stevenson said, "the mentally ill person should be given at least as high a standard of living as obtains in the community from which comes." He rarely gets it. In almost every way the mentally ill live in debased conditions. Their housing is bad, largely because of our habit of "storing them in buildings." Dr. Stevenson suggests that much more outpatient care, and many more training centres and centres for occupational therapy could be provided. Mental hospitals should be reserved for their proper purpose of treating the acutely ill; where they are used merely as asylums they become antiquated, over-crowded, often infested with vermin, poorly safeguarded against fire, and an improper background for modern care and treatment. Yet in many parts of the world there are not even asylums; patients are kept in back rooms, or in gaols, or wander the countryside.

By and large the mentally ill are worse fed than other people; because they destroy their clothing they are often poorly clad or allowed to go naked; where staff is scarce they may be unnecessarily restrained; and the standard of cleanliness both of their quarters and their persons may fall below any tolerable level. Moreover, whereas the physically sick man can count on help *consideration during his convalescence, the mentally* patient has no allowances made for him, and dis and stigma retard his readjustment. Nor is treat always adequate: indeed, the insane patient may never get the treatment which could restore him, and often his chance of recovery is lost because well-meaning friends, fearing the stigma of the mental hospital, postpone his admission. The nurse, doctor, clergyman, teacher, lawyer, social worker, police officer, magistrate, public-health authority, and employer are not trained to recognise and manage well the early signs of mental illness or mental defect. Though we are now aware of some of the factors which help to provoke mental illness, we make little effective effort to be rid of them. Specific factors are syphilis and alcoholism; non-specific factors are early experiences, including especially the broken, or potentially broken, home. Positive mental health has to do with the capacity to live a full and satisfying life, and hence with the opportunity the young person gets for growth and development in his society. The group of interested citizens who have surveyed the ground and decided what is to be done must form themselves into a strong and enduring body for the purpose, and work with government bodies that have the same ends in view. Again and again work of this kind in all countries is hampered by lack of trained staff; and the training of staff is a problem for the nations to solve.

If enough responsible people have determined on an effective mental-health scheme, ways will be found to overcome this and other difficulties. The danger is in apathy, which means in effect—though Dr. Stevenson did not say so—lack of funds; and he pointed out that it is no use trying to be economical in a matter of such importance. Funds are probably not such an acute difficulty in the United States as they are here, where bodies such as the National Association for Mental Health are grossly handicapped by poverty. It is unfortunate that large charitable bodies such as the British Red Cross Society have not yet seen the promotion of mental welfare as an appropriate duty; they could put their funds to few better uses and to many worse; and there is good reason to think that public opinion would back them. Dr. Stevenson believes that by continuous and energetic effort it should be possible to enlist one out of every 15 in the population in the cause of mental health. "The will of such a sizable proportion of the population," he suggests, "is a powerful and legitimate force." It is clear enough from all that was said at the congress that if we want a mentally healthy world every country must set its own mental-health service in order. One of the tasks of the new World Federation for Mental Health will be to advise on the development of such services.

Family background.—Importance is attached to stabi- y of family life, since psychiatric disabilities appear develop most often in students from broken or nsettled homes. It is sometimes argued that the udent who comes from a cultured family should be voured because he has had the benefit of an intellec- ually stimulating environment and will have learnt to hink in the way needed in the professions. Particular reference is usually given to the sons and daughters f doctors; as one dean said, "they know the worst."

Previous achievements.—The boy who has been a chool prefect has presumably a well-developed sense of esponsibility and some capacity for leadership. Excel- ence at games does not count greatly at some universities, ut selectors are pleased to discover interest in corporate ctivities and hobbies or recreations beyond the imme- iate school work. The residential universities give articular weight to such interest since they seek students ho give to, as well as gain from, university life.

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At Liverpool candidates are submitted just before the nterview to a modified progressive matrices test. The results, hich are not examined until the interview committee has warded its own mark, usually tally closely with the com- mittee's grading: where the difference is gross, the committee's marking may be slightly modified.

It is sometimes said that many of the most intelligent potential students are diverted at school to other callings. Some schoolmasters are believed to exercise a selective preference against medicine, deterring their pupils from the study of science and encouraging the best of those who do study it to engage in pure science, on the assumption that second-rate brains are good enough for medicine. Correction of this habit, if it exists, seems to lie with the universities themselves through closer iaison with schools.

Other mental qualities.—The medical course is a fairly stern test of perseverance, and an attempt must be made o judge whether the candidate has the courage to urvive it. It is also a test of emotional stability; so the claims of the candidate with a history of psychiatric isability have to be examined with special care. At more than one school applicants are asked why they want to enter medicine, and what qualities they consider desirable in a doctor. It is believed that sometimes a genuine sense of vocation can be detected. There has to be equal watchfulness for those who apply because they have no special inclination for any other calling or because they have been pressed to do so by parents or school teachers. The sons and daughters of doctors, despite selectors' preference for them, may often belong to this group.

Personality.—"At interviews" said one authority, "we feel we are examining not so much the candidate as his school"; and there is no doubt that the school and family background may prejudice unfairly the impression given by the adolescent candidate. On the other hand, an immature youth, under strong influence from parents, may assume a veneer which, though thin, s not penetrated in the short time of interview. To detect immaturity is probably more important than to reveal the "likeability" so commonly sought; for many ailures in the professional course derive from inability o bridge the gap between the spoon-feeding of home and school and the more independent personal and ducational life of the university. At the age of selection women appear, in general, to be mentally more mature and therefore more acceptable; but the impression is that men draw level during undergraduate training. Women also tend to have a better general education and wider interests, possibly owing to a more catholic training and less intense preoccupation with examinations and games.

GRADING THE CANDIDATE

When the interview is finished the candidate is allotted a mark (perhaps on a 5-point or 7-point scale) which takes account of all the available evidence. Where the interview has been conducted by a committee, there is free discussion before the mark is decided.

At one medical school candidates used to be seen by each member of the committee separately. Having awarded an individual mark, the members met, discussed their findings, and decided on an agreed mark. This practice has been abandoned because candidates reported that they were being asked the same sort of question by each member; and now the committee sits together. Most members consider the new arrangement equally satisfactory, and it saves them much time. Candidates, too, seem to be equally satisfied with it, though their interview with the committee lasts only as long as the former interviews with each member.

The relative importance attached to academic achievements and personal qualities is usually decided arbitrarily for each case. But at one university an attempt is made to place the marking on a more consistent basis, up to 60% of the total marks being allotted for academic achievements, and up to 40% for personal qualities.

WHAT SORT OF DOCTOR?

In choosing students, university authorities have to picture the general qualities which they hope to find in their graduates. Some hold that a faulty bias has been allowed to develop. One dean, himself a research-worker, said:

> "We have concentrated too much on producing scientists. Our first object should be to get good general practitioners, and our second to get first-class people for scientific research."

Similar views are held at other schools. A second dean said:

> "Our task is to make general practitioners. I know a large number of good specialists, but I can count on the fingers of one hand the really good general practitioners; it is too difficult. The qualities to be sought in the general practitioner are intellectual honesty, a high moral standard, and willingness to sacrifice personal interest for that of others. By concentration on other qualities, especially intelligence, the present tendency is not to pick the student with a strong sense of duty. Yet in the new National Health Service, with the practitioner's financial incentives largely removed, this quality is more than ever necessary."

MULTIPLE APPLICATIONS

The total number of applications to the universities does not by any means indicate the total number of candidates. Uncertain of acceptance by any university, many apply to more than one; and it may be assumed that the greater the number of candidates, the greater will be the number of multiple applications. At present the exact extent of this practice is unknown; but at a university in the north of England where all candidates have lately been questioned on this point, they admitted to applying, on average, to about three other medical schools. Allowing for natural reluctance to admit other applications, and for applications subsequently made, the number of previous applications may, in the case of this university be even greater than three.

The effect is to impose on university authorities extra and unprofitable work since they have to consider candidates who may later announce that they have accepted the offer of a place at another medical school.

At the University of Birmingham an attempt has been made to resolve this difficulty. Candidates are encouraged to apply 18 months ahead of the proposed date of entry. Local schools have been notified of this, but a certain number of places is reserved for late applicants. The bulk of pro-

HEADMASTER'S REPORT

The headmaster's report ought to contain most of the information, gathered over years, which selectors try to elicit in a short interview. Yet it is often of little value either because it does not supply the information required or because it paints too glowing a picture. Asked simply for a testimonial, the master can hardly be blamed for shortcomings in his report; and many universities now call for answers to a series of specific questions. The universities drawing most of their students from the immediate locality have an advantage, of course, in that they learn by experience what weight to place on statements from the various local schools.

TIME OF APPLICATION

At some centres applications are considered at a single fixed date in the year, usually about Easter; at some they are considered at one of two or more fixed dates; and at some they are considered as they are received. Exceptionally, the application list is kept open until the late summer. There is natural reluctance to lose the very promising student, for whose rapid acceptance special provision is commonly made.

The difficulty of interviewing large numbers is beginning to attract medical schools to an arrangement which favours the early applicant, and this year some of them have been accepting applications for 1949 and 1950. At one school where all candidates have hitherto been interviewed, vacancies are in future to be filled with suitable candidates as the applications are received.

Final lists of entrants cannot be drawn up until about a month before the start of the academic year since the results of 1st M.B. examination, which determine acceptance for the second year, are not known until June or July, and it may be necessary to wait until the results of the higher certificate are announced.

A SCREENING TEST

At University College, London, a special examination was introduced in 1943 for the purpose of primary selection. At first this examination was taken only by women candidates, but now it is taken by both men and women. By means of it the number of candidates to be finally selected at interview is reduced to about twice the number of places.

Intending students are advised to apply about a year before they wish to enter; no waiting-list is kept. With their application forms they send a small photograph, which is later used for record purposes. They are next required to complete the entry form for the examination, a non-returnable fee of one guinea being charged to deter those who might otherwise sit the examination for practice. The examination, which has been described by Smyth,[2] consists in multiple-choice questions and an essay, and is directed to gauging intelligence rather than learning. The results of each part of the test are being correlated with the student's later performance; and the practice will be modified accordingly. Students from overseas are usually excused the examination, which last year was sat by 738 out of 900 applicants. This year it will be held in November and will be followed by interviews in February and March. Those wishing to enter in either 1949 or 1950 can apply.

At another medical school a similar screening test has been discarded because it was not thought to justify the time taken in setting and correcting the papers and generally organising the examination.

THE INTERVIEW

At some schools candidates for interview are seen only by the dean or his representative, whereas at others they are seen by a committee of 3–7, designed to represent the various teaching interests, which usually includes a woman where women candidates are to be considered. Each practice has its firm defenders. Some say that the committee method reduces the chance of the candidate becoming the victim or beneficiary of individual prejudice; others prefer selection by a single person, on the following grounds:

1. All candidates are scrutinised under the same conditions. Membership of a committee often varies through unavoidable absences or because the members are selected in turn from a panel. Though the dean or senior administrative officer is always present, it is sometimes noticed that his influence does not suffice to prevent variations in criteria.
2. Rapport with the candidate is more readily established by a single interviewer than by a group.
3. Compared with a group drawn from busy heads of departments a single selector is more likely to devote enough time to the work.
4. The single selector often develops a genuine faculty for selecting suitable students.
5. In a committee the member with the strongest personality or convictions is apt to impose his views on the rest of the committee. (This is supported by accounts of disagreement being rare—for instance, "in less than 5% of cases"—which does not suggest much exercise of individual judgment.)

Nevertheless, the committee method has such potential advantages that these contentions should perhaps be used for strengthening rather than abandoning it. For example, members could each allot an individual mark before the final mark was discussed; and constancy of membership might be assured through sterner preliminary elimination, which would reduce the demands on the committee's time.

The *length of the interview* varies at different schools from 5 to 20–30 minutes; and 10 minutes seems to be the most usual time. The proportion of candidates interviewed varies from about twice the number eventually selected up to the total number of applicants; and in general the larger the proportion of candidates interviewed, the shorter is the time given to each.

CONTENT OF THE INTERVIEW

The aim is always to establish an easy, friendly atmosphere; and commonly an approach is made by checking facts on the application form before proceeding to a discussion of interests and finally to a search for any special traits that the interviewers wish to uncover. At Liverpool candidates are asked, before the interview, to indicate on a *pro-forma* their interests and their dislikes. This has been found to save time and to help in establishing rapport.

At no two universities is the task of interviewing approached with quite the same aims; but in general the purpose is to determine the candidate's background, intelligence, interests, character, and personality.

Educational background.—Preference is given to the applicant with a good general education and with some knowledge of the humanities. More than one school complains of poor general education in many of their candidates, attributing this largely to early specialisation and particularly to preoccupation with the higher certificate examination, which has to be passed by those seeking county scholarships. Similarly, a pass in the first M.B. examination before entry is often not regarded as a high recommendation.

At Liverpool a letter sent to local headmasters emphasises the importance of a good general education and points out that absence of qualifications in chemistry, physics, and biology in no way disqualifies applicants from admission.

The large number who pass the 1st M.B. examination before admission is an embarrassment to some universities, which find that they have relatively more places for those starting on the 1st M.B. subjects than those beginning on the second.

This has led one medical school to take for the 1st M.B. course and examination students who have already passed the examination; and students are reported to enjoy this second course, since the approach is different from that at schools. Other medical schools, however, consider this plan unprofitable to the student and discouraging to the teacher.

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2. Smyth, D. H. *Brit. med. J.* 1946, ii, 357.

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It is sometimes said that many of the most intelligent otential students are diverted at school to other callings. ome schoolmasters are believed to exercise a selective reference against medicine, deterring their pupils from he study of science and encouraging the best of those rho do study it to engage in pure science, on the ssumption that second-rate brains are good enough for nedicine. Correction of this habit, if it exists, seems o lie with the universities themselves through closer laison with schools.

Other mental qualities.—The medical course is a fairly tern test of perseverance, and an attempt must be made o judge whether the candidate has the courage to urvive it. It is also a test of emotional stability; so he claims of the candidate with a history of psychiatric lisability have to be examined with special care. At nore than one school applicants are asked why they rant to enter medicine, and what qualities they consider lesirable in a doctor. It is believed that sometimes a genuine sense of vocation can be detected. There has to be equal watchfulness for those who apply because they have no special inclination for any other calling or because they have been pressed to do so by parents or school teachers. The sons and daughters of doctors, despite selectors' preference for them, may often belong to this group.

Personality.—"At interviews" said one authority, "we feel we are examining not so much the candidate as his school"; and there is no doubt that the school and family background may prejudice unfairly the impression given by the adolescent candidate. On the other hand, an immature youth, under strong influence from parents, may assume a veneer which, though thin, s not penetrated in the short time of interview. To letect immaturity is probably more important than to reveal the "likeability" so commonly sought; for many ailures in the professional course derive from inability o bridge the gap between the spoon-feeding of home and school and the more independent personal and ducational life of the university. At the age of selection women appear, in general, to be mentally more mature and therefore more acceptable; but the impression is that men draw level during undergraduate training. Women also tend to have a better general education and wider interests, possibly owing to a more catholic training and less intense preoccupation with examinations and games.

GRADING THE CANDIDATE

When the interview is finished the candidate is allotted a mark (perhaps on a 5-point or 7-point scale) which takes account of all the available evidence. Where the interview has been conducted by a committee, there is free discussion before the mark is decided.

At one medical school candidates used to be seen by each member of the committee separately. Having awarded an individual mark, the members met, discussed their findings, and decided on an agreed mark. This practice has been abandoned because candidates reported that they were being asked the same sort of question by each member; and now the committee sits together. Most members consider the new arrangement equally satisfactory, and it saves them much time. Candidates, too, seem to be equally satisfied with it, though their interview with the committee lasts only as long as the former interviews with each member.

The relative importance attached to academic achievements and personal qualities is usually decided arbitrarily for each case. But at one university an attempt is made to place the marking on a more consistent basis, up to 60% of the total marks being allotted for academic achievements, and up to 40% for personal qualities.

WHAT SORT OF DOCTOR?

In choosing students, university authorities have to picture the general qualities which they hope to find in their graduates. Some hold that a faulty bias has been allowed to develop. One dean, himself a research-worker, said:

> "We have concentrated too much on producing scientists. Our first object should be to get good general practitioners, and our second to get first-class people for scientific research."

Similar views are held at other schools. A second dean said:

> "Our task is to make general practitioners I know a large number of good specialists, but I can count on the fingers of one hand the really good general practitioners: it is too difficult. The qualities to be sought in the general practitioner are intellectual honesty, a high moral standard, and willingness to sacrifice personal interest for that of others. By concentration on other qualities, especially intelligence, the present tendency is not to pick the student with a strong sense of duty. Yet in the new National Health Service, with the practitioner's financial incentives largely removed, this quality is more than ever necessary."

MULTIPLE APPLICATIONS

The total number of applications to the universities does not by any means indicate the total number of candidates. Uncertain of acceptance by any university, many apply to more than one; and it may be assumed that the greater the number of candidates, the greater will be the number of multiple applications. At present the exact extent of this practice is unknown; but at a university in the north of England where all candidates have lately been questioned on this point, they admitted to applying, on average, to about three other medical schools. Allowing for natural reluctance to admit other applications, and for applications subsequently made, the number of previous applications may, in the case of this university be even greater than three.

The effect is to impose on university authorities extra and unprofitable work since they have to consider candidates who may later announce that they have accepted the offer of a place at another medical school.

At the University of Birmingham an attempt has been made to resolve this difficulty. Candidates are encouraged to apply 18 months ahead of the proposed date of entry. Local schools have been notified of this, but a certain number of places is reserved for late applicants. The bulk of provisional acceptances is made in September of the year before entry, by which time the number of places for 2nd M.B. students in the subsequent year can be estimated. Those offered provisional acceptance are given up to 4 weeks in which to withdraw applications to other universities; and they must sign a declaration that they will accept the offer. Commonly the result of the higher school certificate or 1st M.B. examination, on which final acceptance depends, is not known; but from academic records and headmasters' assessments the number who will succeed can be gauged within narrow limits.

Without concerted action there can be no general relief from the effects of multiple applications. One medical school has suggested that all candidates for the London schools should be required to place their names on a central register, at the same time naming schools in order of preference. Applicants would first be considered by the school given as first choice, then, if rejected, by the school of second choice, and so on. Such an arrangement, extended to include all British universities, would reduce the number of candidates to be considered, thus simplifying selection and giving time for more detailed attention to each. It is unlikely, however, that the universities would agree to this course. Rightly insisting on freedom in selection, they often fear that such a device, though voluntary at first, might soon become mandatory; and that central registration would lead to central allocation.

DIFFICULTIES IN SELECTION

About the merits of the various selection methods there are many opinions but few facts; universities may still be choosing some of the worst and discarding some of the best of those that apply. This uncertainty derives from the failure of each method to meet these requirements:

1. It should test suitability for the particular employment which the candidate is to engage in.
2. It should be objective.
3. Its validity should be open to proof by a check of performance against assessment.

Specific tests.—Selectors do not know which path the student will take after qualifying. At entry he may, it is true, express a clear intention; but little or no significance can be attached to this, since it is formed in adolescence, before acquaintanceship with any subject of medicine, and often from romantic notions. Selectors, for their part, are unable to prophesy the career for which the student will be best suited. He may become barrister or bacteriologist, geriatrist or journalist, psychiatrist or surgeon. In medicine there is room for almost every skill; so it may be doubted whether aptitude tests based on analyses of the diverse postgraduate occupations will ever earn a place in selection. There would, on the other hand, be great advantage in prediction of a sufficient aptitude for the subjects in the medical curriculum, for after the 1st M.B. these are different in character from any previously studied. A boy who has excelled in pure science may make a poor showing at medical subjects; and it seems that while the intercorrelation between medical subjects taken at the same time is fairly high, that between 1st M.B. subjects and those of subsequent years is much lower: "a test in medical subjects or subjects of a similar nature might prove of better prognostic value than the present examination in subjects representing merely a general education."[3] With this objective in mind, Prof. L. S. Penrose[4] makes the following interesting suggestion:

> Candidates might be exposed to a miniature medical course lasting 2–3 days and dealing with the chemical, biological, histological, and clinical aspects of a single topic—e.g., inflammation or fractures. At the end they would undergo an examination, which should reveal whether their minds had a real aptitude for medicine. It would prove their capacity for accurate observation, deduction, and judgment on the information provided.

Objectivity.—Usually the only objective evidence in the hands of selectors is the record of examination results and of non-academic achievements; and even those have to be interpreted in the light of the candidate's circumstances and opportunities.

Validity.—Selection and training are directed to the same end—the making of able doctors. Though success in professional examinations may afford suggestive evidence, it does not in itself prove that this end has been gained. Professional examinations are principally tests of factual knowledge, whereas the true criterion is ability to apply this knowledge. These two do not necessarily go hand in hand; and in at least one university the award at graduation to the best student of the year is regarded as a passport to obscurity. In medicine, perhaps above all other branches of science or the arts, there is need for a preliminary test of the candidate's probable capacity for using the knowledge he is to gain at the university. But no such test exists; and since there is no common measure for judging success or failure in the various postgraduate fields, the final examination, despite its shortcomings, must probably be accepted at present as the end-point of any follow-up.

THE FUTURE

Dissatisfaction with existing procedures centres on the inadequacy of the short interview in dealing with large numbers of candidates. At the best an interview, as Oldfield[5] has made clear, is a complex and hazardous undertaking; and universities have to decide whether they are being more just to themselves and to candidates in giving a brief interview to all eligible candidates than they would be in first eliminating some and then considering in detail the claims of the remainder; an interview of 10 minutes, even when backed by other information, is after all a very short time in which to decide a youth's future. At the same time selectors are naturally reluctant to buy increased efficiency in selection at the price of further time lost to departmental duties.

Few doubt that more ruthless preliminary selection is desirable; but how is this to be effected? A properly conducted certificate examination would meet the need. Otherwise, the only possible means, as Smyth[2] has observed, appears to be for the medical schools to set their own preliminary examination. Were this examination to take the form of a test of intelligence, it would provide the least possible advantage to those who had been trained for it at school, though at the International Congress of Psychology in Edinburgh this year Miss A. W. Heim, PH.D., showed that training may improve performance considerably more than has been thought. Such a test may, incidentally, help to reveal those insufficiently gifted to pass the professional examinations. But here the gap between precept and practice is wide. Most authorities are suspicious of psychological tests, and there is still no statistical evidence to allay this suspicion. It can, moreover, be argued that selection by intelligence would eliminate some who, though not specially clever, would nevertheless make good doctors. Some universities are now taking a middle course by using intelligence or other psychological tests to supplement the usual procedures, or simply in order to evaluate their worth.

In whatever direction selection methods evolve, they must always have two aims: first to eliminate before the start of training the student who, for one reason or another, will fail; and secondly to discover the particular type of man and woman which the university wishes to train.

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[3] Prognostic Value of University Entrance Examinations in Scotland: Scottish Council for Research in Education. London, 1936; pp. 179, 187.

[4] Personal communication.

[5] Oldfield, R. C. Psychology of the Int[illegible] London, 1941.

Students Guide

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Medical Schools

At OXFORD UNIVERSITY the number of new students restricted by decree; and the number for the coming ear has been fixed, as it was last year, at 55 men and 0 women. Ex-Service men and women are only dmitted over and above these numbers if they were orn before Jan. 1, 1929. The various colleges put orward the names of the students they wish to be dmitted to the medical school, and preliminary accepance by a college is essential for any prospective medical tudent. All students entering the school in the future ill be required to take the second public examination s before the war; the course normally taken to satisfy his regulation is the final honour school of animal hysiology, which takes up one year after passing the natomy and physiology examination for the B.M. degree. he newly established clinical school in Oxford enables tudents to qualify at the Radcliffe Infirmary as an lternative to transferring to a teaching hospital in ondon or elsewhere. A students' club has been opened his year in Osler House, in the Infirmary grounds, hich gives social and reading facilities, and sleeping ccommodation for those on duty in the hospital. This ocial, administrative, and teaching centre will be comleted by a lecture-room and a class-room which are oon to be constructed in an adjoining building.

In the UNIVERSITY OF CAMBRIDGE the post of professor f animal pathology has been revived, and it is proposed o establish a school of veterinary medicine. During he preclinical period veterinary students will work in onjunction with their medical brethren in the basic ubjects which are common to both professions. If this proposal of a complete school is accepted, the new venture should be of mutual benefit to both medicine ind veterinary medicine. The natural science tripos, the great and abiding advantage which Cambridge offers, will include instruction by the professor of animal pathology, thus broadening the outlook of the medical tudent. Likewise, veterinary students will benefit from nstruction in the fundamental aspects of human pathoogy. The first step has been taken towards establishing university department of pædiatrics, by the appointnent of a pædiatrician to the staff of Addenbrooke's Hospital. A department of human ecology has been stablished with the appointment of a reader who is argely concerned with epidemiological studies, whilst he university health service, which will carry out prophyactic examinations, including mass radiography, will e ready to work to full capacity on the new intake n October. The department has also appointed a statistician, whose services will be available to all the medical and biological departments. The postgraduate school is now well under way. One of its most successful ventures has been the establishment of trainee posts in the clinical pathological departments of Addenbrooke's Hospital, under the control of the professors of pathology and biochemistry. These posts (which carry a living wage) offer a two-years course of training in all the aspects of clinical pathology, post-mortem work, histology, and chemical pathology. To attract into medicine boys who have not begun to specialise at school, Peterhouse offers a scholarship for medical students in non-medical subjects.

London Schools

LONDON UNIVERSITY bears a different relation to its medical faculty from other universities: whereas they have one school of medicine each, London has the twelve autonomous schools of the teaching hospitals, as well as University, King's, and Queen Mary Colleges, all of which take medical students for some part of the preclinical course. All the medical schools are now open to men and women students.

The preclinical course at UNIVERSITY COLLEGE has now the full use of the facilities interrupted by the war. The X-ray department has been re-equipped, and the museum, which was dispersed during the war, is being replaced as a new type of teaching museum in which the specimens are accompanied by descriptive literature and the functions of the organs are considered along with the structure. Part of the museum has been used to make cubicles for the study of surface anatomy and for human physiological and pharmacological experiments.

KING'S COLLEGE has in its medical faculty one of the largest schools for preclinical studies in London. Its members share fully in the social and athletic activities of students from all six faculties of the college. Clinical studies are pursued at King's College Hospital, St. George's, or Westminster. Arrangements are made by which patients attend the college for clinical demonstrations in applied physiology given by clinicians. Hostel accommodation for a limited number of men is available at King's College Hall, Champion Hill, S.E.5.

The arrangements made by the joint committee of QUEEN MARY COLLEGE and the London Hospital medical college are working efficiently; and now that Queen Mary College holds its own special internal first examination for medical degrees the teaching subcommittee has organised the instruction in physics, chemistry, and biology to fit in closely with preclinical teaching. All available places are taken by London Hospital men and women: during the 1947–48 session 72 first medical and 6 premedical (conjoint) students passed through the departments.

The new health service does not necessitate any immediate drastic changes in the training of students at UNIVERSITY COLLEGE HOSPITAL. The success of the new organisation, in so far as medical education is concerned, will depend largely on friendly coöperation between the members of the hospital boards of governors and the teachers in the medical schools. Members of the boards have not all been chosen because of their interest in medical education, yet it is vital that all should realise that the treatment of sick people can be integrated with the clinical training of doctors-to-be in such a way that the needs of all are satisfactorily met. St. Pancras Hospital and the Hospital for Tropical Diseases have now been taken over; and the total number of beds available for teaching at U.C.H. will soon be well over 1000. St. Pancras has a mental observation unit dealing each year with some 2000 cases of acute mental disorder; it also has an obstetric block which will eventually add some 80 beds to the existing 85 in the parent hospital. Here a unit for the care of the chronic sick is being established.

ST. BARTHOLOMEW'S HOSPITAL medical college is still faced with the problem of fitting an abnormally high number of suitable applicants for entry, many of them ex-Service, into buildings, both of the college and of the hospital, whose usefulness has been diminished by war damage. The second part of the problem is approaching solution. In addition to the temporary repairs which have been carried out during the last two years, a start can now be made on the permanent rebuilding of the preclinical college. On the clinical side increasing use is being made of nearby hospitals to relieve the pressure on the material in St. Bartholomew's itself; and this will continue until the blocks rendered useless by the war can be reopened.

Last October the departments of anatomy and physiology at CHARING CROSS HOSPITAL were reopened in new extensions to the school buildings, and 45 students (20% of them women) have now completed in these departments the first year of the 2nd M.B. course. The venture has proved very successful; and the reunion of preclinical and clinical subjects has benefited both staff and students. The establishment of the National Health Service has had some repercussions on the school, which has now become a legal entity and will be controlled

The revised curriculum introduced last year at WESTMINSTER MEDICAL SCHOOL has proved its worth, and urther changes are being considered. The number of ndergraduate students is rapidly increasing and will each 165 by next April. Under the National Health ervice Act a new board of governors has been formed for Westminster Hospital and its designated hospitals (the Westminster Children's Hospital, the Gordon Hospital, nd All Saints' Urological Centre), and a new council for he school, which will in future be known as Westminster Medical School. The school thus becomes autonomous, ut its links with its parent hospital will be strengthened ather than weakened under the new system, and it will learly play an increasingly important part in medical ducation in its region. That the school is an integral art of London University is emphasised by the appointment to its council of two representatives of the Senate, part from internal members. Women clinical students ntered the school last April for the first time in many ears; separate common-room accommodation has been provided. Competition for entry among women candidates is exceptionally keen; it is hoped to increase the numbers admitted as clinical facilities become available. Plans for expansion have been proposed since existing resources for teaching pathology will soon be severely taxed. There are already enough beds for the clinical instruction of the present numbers. It is hoped eventually to create a 1000-bed teaching centre in the area bounded by St. John's Gardens and Vincent Square, which are a five-minute walk apart. A preclinical school for 150 students is contemplated. Valuable experience of emergency cases is expected from closer integration with St. Stephen's Hospital, Fulham. Closer linkage with child welfare centres in the district will ensure that students obtain instruction not only in children's diseases but in child health as a whole.

At the SCHOOL OF DENTAL SURGERY of the ROYAL DENTAL HOSPITAL of London the curriculum for the first two years includes the study of dental mechanics, dental prosthetics, the properties of dental materials, general anatomy and physiology, and special anatomy and physiology. The anatomy and physiology courses are held at King's College in the Strand. For the second two years students attend lectures and clinics on general medicine and surgery at Charing Cross Hospital medical school, and lectures and practice in dental surgery at the dental school.

Other English Schools

At the UNIVERSITY OF DURHAM there has been a slight decline in the number of ex-Service candidates. This has not affected the total number of applicants, which remains greatly in excess of vacancies. The 2nd M.B. examination has been re-arranged. From next March this will be held in two parts, as before; but part 1, held in March after five terms' work, will consist of physiology only, while part 2, held in June after six terms' work in anatomy, will consist of anatomy and pharmacology and pharmacy. The new department of psychological medicine is now coöperating with the department of medicine in the teaching of undergraduates; and it is hoped that some postgraduate training in psychological medicine will soon be possible.

At the UNIVERSITY OF BIRMINGHAM * a committee has recently been appointed to review the medical curriculum. The course in applied anatomy is in future to be under the direction of the department of anatomy in collaboration with the heads of clinical departments; as soon as the necessary arrangements can be made an integrated course of lectures will be instituted in which the anatomical, physiological, pathological, bacteriological, medical, surgical, and gynæcological aspects of disease will be closely linked. Some modifications in the introductory course are anticipated next year, and students will be directed to medical clerking and surgical dressing as soon as they have completed this part of the clinical curriculum. The regulations for higher degrees—M.D. and CH.M.—have been amended, and the main emphasis will in future be on a thesis based either on original research or on the application of scientific method to medicine or surgery. The regulations for the degree of PH.D. of the faculty of medicine have also been amended. The degree of M.D. in State medicine has been abolished. The full-time clinical professors have been bringing their staff up to full strength. Research programmes are being sponsored in all these departments, to which some promising research-workers are being attracted. The faculty has adopted the principle, observed by older universities, of creating a professorial chair for those whom the university wish to honour. Appointments have been made to the chair of therapeutics and the chair of gastro-enterology—the only one of its kind in the British Isles. A second chair of anatomy has been created. A further innovation is the establishment of two chairs of pathology—one of experimental pathology and the other of morbid anatomy. In the department of medical statistics a new post has been created—that of senior statistical officer. Consideration has been given to the production of films for university education; and a Senate committee has lately been set up to observe developments in this field.

At the UNIVERSITY OF LIVERPOOL * applications are still greatly in excess of the 100 available places. New developments in undergraduate teaching include allocation of specific periods during clerking and dressing for instruction in the administration of anæsthetics and in clinical pathology. Postgraduate teaching offers full-time courses for the degrees of CH.M., M.CH. ORTH., and M.RAD., granted by the university, and for the diplomas of D.P.H. and D.T.M. & H. (the latter in conjunction with the Liverpool School of Tropical Medicine). These courses are also suitable for candidates studying for the F.R.C.S. or D.M.R. examinations. There is a new full-time course in anæsthesia and a course throughout the academic year for postgraduate students proceeding to the degree of M.D., which is usually attended also by candidates for the M.R.C.P. A part-time course in obstetrics and gynæcology is held throughout the academic year, and a short intensive course in pædiatrics, lasting 3 weeks and suitable for candidates studying for the D.C.H., is held once or twice a year.

MANCHESTER UNIVERSITY * admits about a hundred medical students each year. A few of these enter the second year of study because they have passed part or the whole of the 1st M.B. examination externally. A period of six months' residence is obligatory for all medical students during the period of clinical study. This is provided for in a special hostel adjacent to the teaching hospitals. There are facilities for postgraduate work in many special subjects, both ancillary to medicine and in the clinical field. A full-time chair of social and preventive medicine has lately been established, and this department will probably be concerned among other things with the provision of a health service for all university students. A research centre for the study of chronic rheumatism, set up through the generosity of the Nuffield Foundation, is now actively at work. A development which is foreshadowed is the institution of a department of psychiatry, with a full-time professor as its director.

At the UNIVERSITY OF LEEDS * the intake cannot be increased beyond 75 each year without further building. The undergraduate course once more extends to five years and two terms. The 1st M.B. course is closely integrated with the rest of the curriculum; the teaching in zoology is designed as an introduction to anatomy and physiology, and the standard of organic and physical chemistry in this course is in most other schools reached only at a later stage. Under Ministry of Labour regulations, the Leeds 1st M.B. course is recognised as "medical course proper"; and the university does not generally grant exemption from it. During the course attendance at a class of medical mathematics is required of all who have not reached principal standard in mathematics in the higher school certificate examination. During the first year of the 2nd M.B. course undergraduates are encouraged

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* The entrance requirements for the Universities of Manchester, Liverpool, Leeds, Sheffield, and Birmingham are laid down in the pamphlet *Qualifications for Entry upon a Degree Course*, copies of which may be obtained from the Secretary to the Board, 315, Oxford Road, Manchester, 13. Additional faculty requirements may, however, be imposed: details can be obtained from the dean of the faculty of medicine in each university.

UNIVERSITY DEGREES

Bachelor of Medicine and Surgery

All the universities in the United Kingdom, except Reading, offer baccalaureate degrees in medicine and surgery, conferred on the results of examination.

HIGHER QUALIFICATIONS

Those who have graduated in medicine and surgery are at liberty to seek higher qualifications if they wish.

Doctor of Medicine and Master of Surgery

Graduates holding a bachelor's degrees can take the degree of Doctor of Medicine or Master of Surgery. All universities with medical faculties in Great Britain and Ireland confer such degrees. London University offers the M.D. in general medicine, and in pathology, psychological medicine, midwifery and diseases of women, hygiene, and tropical medicine; the M.S. is obtainable in general surgery, and in dental surgery, ophthalmology, and laryngology, otology, and rhinology. At the University of Durham the degree of Doctor of Surgery (D.CH.) is offered in addition to the degree of Master of Surgery (M.S.). Liverpool offers the orthopædic degree of M.CH. ORTH., the regulations for which have lately been revised.

Master in the Science of Obstetrics and Master of Midwifery

The Irish universities grant the degree M.A.O. The Society of Apothecaries of London grants the Mastery of Midwifery (M.M.S.A.) upon examination in obstetrics, pædiatrics, and public health. The examinations are held in May and November, and regulations may be obtained from the registrar, Apothecaries' Hall, Black Friars Lane, E.C.4.

MEMBERSHIP AND FELLOWSHIP

The Royal College of Physicians of London confers the Membership (M.R.C.P.), which is obtained by examination. Examinations are held four times in each year, and medical graduates and licentiates of the college over twenty-three years of age may sit for it. Details can be obtained from the secretary, Royal College of Physicians, Pall Mall East, London, S.W.1. Fellows of the college are elected annually at a general meeting of the college.

The Royal College of Surgeons of England grants a fellowship to those passing the primary and final F.R.C.S. examinations. The primary examination is open to those who hold a qualification registrable in the British Medical Register and to graduates in medicine and surgery of universities and medical colleges recognised by the council. Subjects of the primary examination are anatomy (including normal histology), applied physiology, and the principles of pathology. The final examination can be taken in general surgery, ophthalmology, or otolaryngology. To be admitted to the final examination in general surgery candidates must produce evidence of having been engaged in acquiring professional knowledge for not less than two years (increased to three years as from 1949) after taking a medical qualification, and of having held the requisite resident surgical posts during a part of that time. Candidates for the final examination in ophthalmology or otolaryngology must have been qualified for three years and must have held general and specialist resident posts during an aggregate period of eighteen months. The primary examination is held in January and July; and the final examination is held in May and November. The college also grants a fellowship in dental surgery, for which there is a primary examination in applied anatomy, and applied physiology and the principles of pathology, with special reference to the teeth and jaws, and a final examination in surgery, oral pathology and bacteriology, and dental surgery. Copies of the new regulations and full particulars may be obtained from the examinations secretary, Examination Hall, Queen Square, London, W.C.1.

Medical graduates who have been registered, or eligible for registration, for at least three years may apply for examination for membership of the Royal College of Obstetricians and Gynæcologists (M.R.C.O.G.). Particulars of the regulations may be obtained from the secretary, Royal College of Obstetricians and Gynæcologists, 58, Queen Anne Street, London, W.1.

The fellowship (F.R.C.O.G.) is granted to members who are judged by the council to have advanced the science and art of obstetrics and gynæcology.

Graduates may become members of the Royal College of Physicians of Edinburgh (M.R.C.P.E.) on passing an examination, particulars of which may be obtained from the secretary, 9, Queen Street, Edinburgh, 2.

The fellows are selected from among the members by the council of the college, and receive the designation F.R.C.P.E.

Fellowship of the Royal College of Surgeons of Edinburgh (F.R.C.S.E.) is granted to medical graduates who pass the required examinations. Under new regulations which come into force at the beginning of next year the examination will be divided into two parts—the first on anatomy and physiology and on pathology and bacteriology, and the second on the principles and practice of surgery and on one of four special subjects to be chosen by the candidate. Unsuccessful candidates who appeared for examination on or before March 15 this year may still elect to be examined under the existing regulations. Particulars of the regulations may be obtained from the clerk of the college, Surgeons' Hall, 18, Nicolson Street, Edinburgh.

The Royal Faculty of Physicians and Surgeons of Glasgow grants, after examination, a fellowship registrable by the G.M.C. as an additional qualification (F.R.F.P.S.G.). Admission is by examination and subsequent election. The candidate may be examined in either medicine or surgery; and for both examinations new regulations will come into force on June 1, 1949. From this date candidates for the fellowship in medicine must have been in possession of a recognised medical qualification for not less than three years, and must have been engaged during one of these years in full-time clinical work in a recognised hospital and have spent two other postgraduate years in medical work approved by the faculty. Candidates for admission to the fellowship in surgery will be required to possess a recognised medical qualification and to pass a primary and a final examination. For admission to the final examination candidates must have been in possession of a recognised medical qualification for not less than three years and produce evidence that they have been engaged, after qualifying, for one year in full-time clinical work in a hospital approved by the council and for a further two years in the study of surgery or its allied sciences. Alternatively, candidates may submit themselves for examination in one of the following subjects: obstetrics and gynæcology, ophthalmology, or otorhinolaryngology. Details may be had from the secretary of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.

Membership of the Royal College of Physicians of Ireland (M.R.C.P.I.) is granted on the result of an examination, the details of which may be obtained from the registrar of the college, 6, Kildare Street, Dublin.

Fellows are elected by ballot from among the members, and receive the designation F.R.C.P.I.

Graduates seeking the fellowship of the Royal College of Surgeons in Ireland (F.R.C.S.I.) must pass in two examinations, a primary in anatomy, physiology, and the principles of pathology, and a final in surgery. Further particulars may be obtained from the registrar, the Royal College of Surgeons in Ireland, Dublin.

The Faculty of Radiologists offers a fellowship (F.F.R.) to medical graduates of five years' standing who have spent at least one year in general clinical work at an approved hospital, hold a radiological diploma, and have practised radiology exclusively for at least three years after obtaining that diploma. Candidates are required to pass an examination and submit a thesis. Candidates who hold higher medical or surgical qualifications may be exempted from the examinations in general medicine, general surgery, or pathology. Full particulars may be obtained from the warden, the Faculty of Radiologists, 45, Lincoln's Inn Fields, London, W.C.2.

SPECIAL DEGREES AND DIPLOMAS

The regulations for the following diplomas can be obtained by applying to the examining bodies concerned.

Public Health

A diploma in public health (D.P.H.) is granted by the English conjoint board, and by all the universities of the United Kingdom, except Oxford, Cambridge, and Sheffield.

Courses for the D.P.H., suspended during the war, have n resumed in most places, with curricula revised to et the new G.M.C. requirements.

ychological Medicine

The universities of London, Durham, Leeds, Man-ester, Bristol, Edinburgh, Belfast, Ireland (National iversity), and the English and Irish conjoint boards er diplomas in psychological medicine. (The Univer-y of London also grants a diploma in psychology, ken chiefly by social workers.) The courses for the ploma have not all been resumed.

diology

The Faculty of Radiologists grants a fellowship F.R.), which has already been mentioned. The univer-ties of London, Bristol, and Edinburgh and the English njoint board offer two diplomas: one in medical diodiagnosis (D.M.R.D.) and one in medical radio-erapy (D.M.R.T.). The London University course sts two years; the Bristol and Edinburgh courses for e D.M.R.D. last eighteen months, and for the D.M.R.T. wo years. The M.RAD. of Liverpool University is nted in either radiodiagnosis or radiotherapy after a wo-year course.

ropical Medicine

A diploma in tropical medicine and hygiene (D.T.M. & H.) s granted by Liverpool University jointly with the iverpool School of Tropical Medicine, by the University f Edinburgh, and by the English conjoint board. ourses are held at the Liverpool School of Tropical edicine, at Edinburgh, and at the London School of ygiene and Tropical Medicine.

ynæcology and Obstetrics

Medical graduates who are on the British Register, or ligible for registration on it, may apply to the Royal ollege of Obstetricians and Gynæcologists for examina-ion for the diploma in obstetrics (D.OBST.). The Univer-ty of Dublin also offers a diploma (D.G.O.) for which ourse is held at Trinity College; candidates spend six onths as residents in one of the three Dublin maternity ospitals. The Mastery of Midwifery granted by the ociety of Apothecaries of London has already been entioned.

phthalmology

The English and Irish conjoint boards issue a diploma n ophthalmology (D.O.M.S.). The final examination for he F.R.C.S. may be taken in ophthalmology. Examina-tions for the D.O. of Oxford University will cease after he end of this year.

aryngology and Otology

The English conjoint board offers a diploma (D.L.O.) or those who have made a special study of the ear, nose, harynx, and larynx. The final examination for the R.C.S. may be taken in otolaryngology.

næsthetics

The English and Irish conjoint boards offer diplomas n anæsthetics (D.A.). Candidates must have special xperience in giving anæsthetics.

hild Health

Diplomas in child health (D.C.H.) are granted by the nglish and Irish conjoint boards; also by the National niversity of Ireland, with a course at University ollege, Dublin.

Tuberculous Diseases

Examinations for the diploma in tuberculous diseases (T.D.D.) of the University of Wales have been resumed.

Bacteriology

Diplomas in bacteriology are granted by the universities of London and Manchester. Courses held at the London School of Hygiene and Tropical Medicine and at Manchester begin in October and last one academic year.

Clinical Pathology

The University of London offers a diploma in clinical pathology (D.C.P.) for which a year's course of study is required.

Physical Medicine

The English conjoint board offers a diploma in physical medicine (D.PHYS.MED.). Candidates must have held a registrable qualification for two years, and must have had two resident appointments occupying not less than a year.

Orthopædics

Liverpool University offers the degree of M.CH.ORTH.; the course for it lasts fifteen months.

Industrial Medicine

The University of Edinburgh, the Society of Apothecaries of London, and the English conjoint board offer diplomas in industrial health (D.I.H.). Courses are held at Edinburgh and Glasgow, and by the Society of Apothecaries of London and the Royal Institute of Public Health and Hygiene.

DENTAL DEGREES AND DIPLOMAS

There are schools of dentistry at the universities of London, Durham, Birmingham, Liverpool, Manchester, Leeds, Sheffield, Bristol, Glasgow, St. Andrews, Belfast, and Dublin; and at the University Colleges of Dublin and Cork, in the National University of Ireland. London University offers a B.D.S. and an M.S. in dental surgery; it also prepares students for the L.D.S. of the Royal College of Surgeons. This college has lately instituted a fellowship in dental surgery (F.D.S.). St. Andrews offers a B.D.S. Leeds grants a diploma (L.D.S.), a baccalaureate degree (B.CH.D.), and mastership (M.CH.D.). Glasgow University and the University Colleges of Dublin and Cork grant a B.D.S. and a M.D.S., and Trinity College, Dublin, offers a B.DENT.SC. and a M.DENT.SC. All the other universities mentioned offer L.D.S., B.D.S., and M.D.S.; St. Andrews offers a diploma in public dentistry (D.P.D.) in addition. Licences in dentistry are granted by the Royal College of Surgeons of Edinburgh, the Royal Faculty of Physicians and Surgeons of Glasgow, and the Royal College of Surgeons in Ireland. The Royal College of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow confer a higher diploma in dental surgery.

THE MEDICAL WOMEN'S FEDERATION

ALL qualified medical women are eligible as members of the Medical Women's Federation, which has active local associations all over the country and in Northern Ireland, as well as a large London association and an overseas association linking up members all over the world. The federation is non-political. It provides medical meetings for its members and publishes a quarterly journal reviewing subjects of special interest to women doctors. These naturally cover a wide tract of social medicine, including maternity and child welfare, women in industry, the care of children and of difficult and delinquent children, the management of nursery schools and day-nurseries, women in prisons, children in approved schools and remand homes, the illegitimate child, and many related subjects. Advances in obstetrics and gynæcology, and psychological studies of women and children are also naturally of special interest to women doctors; and recent work in these branches of medicine is reviewed in the journal. From time to time the federation undertakes social studies and publishes the results. It is also able to protect the interests of its members by presenting arguments in any cases where there has been discrimination against women doctors.

The Defence Services

Royal Naval Medical Service

Medical officers are now admitted to the Royal Navy on a short-service engagement of four years or, in the case of National Service candidates who do not wish to serve for this period, are granted temporary commissions in the Royal Naval Volunteer Reserve. Candidates must have had at least six months' experience in a house-appointment. At present no women medical officers are employed. Candidates for the Royal Naval Dental Service are also entered on short-service engagements of four years.

Opportunities are given to medical and dental officers during their temporary service or short-service engagement to apply for transfer to the permanent service. Copies of regulations and forms of application may be had from the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1.

Royal Army Medical Corps

Direct applications are now invited for short-service Regular Army commissions in the R.A.M.C. for a period of eight years of which the first four years will be on the active list of the Army and the remainder on the Regular Army reserve of officers. Appointment will be in the rank of lieutenant. Candidates must be: (1) normally not over 30 years of age, (2) British subjects whose parents are British subjects, and (3) registered under the Medical Acts in force in Great Britain and Northern Ireland. Such officers will, during the last fifteen months of service on the active list, be considered for appointment to a permanent Regular Army commission. If they do not desire or are not selected for a permanent commission they will, on completion of their four years' short service on the active list, receive a gratuity of £600. Full conditions of service and forms of application can be obtained on application in writing to the Assistant Director-General, Army Medical Services (A.M.D.1), 38, Hyde Park Gate, London, S.W.7. On the nomination of the Central Medical-War Committee doctors are appointed to emergency commissions in the rank of lieutenant. During their period of service they can apply for a short-service Regular Army commission, and they can be subsequently considered for a permanent commission under the conditions already outlined.

ROYAL ARMY DENTAL CORPS

Direct applications for Regular commissions in the Royal Army Dental Corps are not being invited at present. On the nomination of the Ministry of Health dental surgeons are appointed to emergency commissions with the rank of lieutenant. Such officers may apply at once for Regular short-service commissions under existing regulations, and if selected are eligible for appointment, at any time, to a permanent Regular Army commission. Candidates for short-service commissions must be not over 35 years of age, and they must be British subjects whose parents are British subjects; they must also possess a degree or licence in dental surgery of a British university or recognised licensing body, and be registered under the Dentists Act in force in Great Britain and Northern Ireland and undertake to remain so registered throughout their service. If they do not desire or are not selected for a permanent commission they will, on completion of their four years' short service on the active list, receive a gratuity of £500. Immediately on qualification dental surgeons wishing to enter the Royal Army Dental Corps should notify the Secretary, Ministry of Health, Whitehall, London, S.W.1.

Royal Air Force Medical Branch

A scheme to grant short-service commissions to registered medical men of British nationality who wish to serve in the R.A.F. Medical Branch, or who wish to re-enter the Service, has now been approved. By its terms doctors under 30 years of age on application (for the next few years the age will be 32) will be considered for the grant of commissions for a period of four years on the active list, followed by a period of four years on the reserve. During his service on the active list a medical officer will be considered for the grant of a permanent commission. Should he not be selected a permanent commission he will be eligible for a gratuity of £600 on completion of four years' active-list service on the short-service commission.

The rank on entry will normally be that of flying officer, but allowance will be made for the full period of any previous service as a medical officer in the Royal Navy the Army, the R.A.F., or the Indian Medical Service. There are also provisions under which entrants may first engage in a whole-time postgraduate appointment in a recognised hospital, or complete such an appointment if already held; in either case the period of the appointment, up to a maximum of one year, will count towards seniority in the rank of flight lieutenant. Similarly, an entrant who has previously held such a postgraduate appointment may receive an antedate of his commission equivalent to the period of the appointment, but not exceeding one year. Accepted applicants will be required to serve in any part of the world and will be required pass an examination by a Service medical board to assess their fitness to do so, and also their fitness to fly as passengers. Further particulars can be obtained on application to the Under-Secretary of State for Air (D.G.M.S.), Awdry House, Kingsway, London, W.C.2.

R.A.F. DENTAL BRANCH

Short-service commissions for a period of four years in the Dental Branch of the R.A.F. are now available to qualified dental surgeons. Officers holding short-service commissions will be eligible for selection for permanent commissions. Those not selected will receive a gratuity on completion of their short-service engagement. Further information may be obtained on application to the Under-Secretary of State for Air (D.G.M.S.).

Health Services at Home

PUBLIC HEALTH

THE introduction of the National Health Service has no direct effect on the duties of the medical officer of health in environmental hygiene. These responsibilities have evolved over the last hundred years from the basic sanitary services introduced with difficulty and by slow stages at the instigation of the first M.O.H.s. Originally the M.O.H. was closely concerned with the detailed execution of all this sanitary work, but the passage of years has led to the general acceptance of much that was originally secured with difficulty and spasmodically by his express personal intervention. Health departments are now organised to allow the M.O.H. freedom from much detailed work which can be effectively performed by trained lay officers or even transferred to the care of other departments, as in water-supply and sewage disposal. Naturally the extent of this devolution of responsibility varies widely. Rural water-supplies and sanitation remain a constant concern of the M.O.H. The supervision of housing conditions, again mainly through sanitary inspectors, is a health-department responsibility. All this work must remain under the general control of the M.O.H., and he must also supervise the quality of water-supplies even though their production is not his concern. Though less concerned personally with detailed sanitary work, he now supervises a far wider field than his predecessor of a hundred years ago.

Control of infectious diseases has always been one of the main concerns of the M.O.H. The old emphasis on isolation has now been replaced by the provision of modern hospital treatment, but there remains the active home follow-up. Bacteriologists have made great advances in the identification of different strains within certain of the pathogenic species, and these new techniques applied to epidemic control, have given the M.O.H. an instrument of precision in much of his epidemiological work. The application of specific prophylactic measures against various of the acute infections is now a major function of health departments; and already the control of such diseases as diphtheria and enteric fever is in sight.

The National Health Service Act has profoundly affected the work of the M.O.H.s of counties and county boroughs—local health authorities as they now are ıey have ceased to hold any responsibility for adminiration of hospitals, except that some individuals are embers of hospital management-committees. During e last nineteen years hospital administration has cupied the time of these M.O.H.s in some sense at the pense of preventive medicine in which they have been ecially trained. Nevertheless it will rest very largely ith them to secure close coördination of hospital and eventive services at the management-committee level; déed their influence at this point is crucial. No other edical men will be so well placed to survey the whole eld of medical activity in an area. Local health ıthorities have now formulated schemes, under part 3 the Act, for the provision of clinic and other services r mothers and preschool children, domiciliary midwifery, ealth visiting, home nursing, immunisation and vacnation, ambulances, care and aftercare, and domestic elp; and some have preliminary schemes for health entres. This is a far more comprehensive range of ersonal health services than previously existed, especially hen the increased scope of the School Health Service nder the last Education Act is associated with it. he M.O.H. is the officer on whom the administration f these services falls. Their complexity and the need or local knowledge in day-to-day administration has ed most counties to devise schemes of divisional dministration which are of particular importance o the student because of their effect on the path of ntry to the public-health service, especially where livisional county posts are combined with the office f M.O.H. to one or more county districts.

The mode of entry to the service will probably not, s in the past, be through the clinical side but through ssistant administrative posts concerned with control f infectious diseases and organisation of clinic services. Thus there will be far less likelihood of medical officers who have taken postgraduate qualifications in public ealth devoting the rest of their professional lives to linical work in a limited field. The very fact that hose who undertake clinical preventive work will also e engaged in curative work will bring the administrative nedical officer responsible for the organisation of clinic ervices into far closer contact with his professional olleagues. It is probable that experienced general ractitioners will play an increasing part in the clinic ervices of local health authorities. For many years here will, of course, be whole-time officers engaged in linic work, but it does seem likely that the publicealth officer of the future will be usually concerned with rganisation rather than with routine clinic duties. This edistribution of work coupled with the provision of ealth-centre buildings for general practice by local ealth authorities should help to produce an ever closer ssociation between M.O.H. and general practitioner— voluntary association arising from a knowledge of the elp each can give the other.

The curriculum for the diploma in public health now rovides a first part which is suitable for men engaged n tuberculosis or venereal-diseases work; a certificate is iven to those who pass the examination for part 1 only. The course for part 2 provides for those who intend to take the diploma and enter the public service. Possession of a D.P.H. is necessary for anyone now seeking appointment as a medical officer of health.

INDUSTRIAL MEDICAL SERVICES

THE term "industry" includes not only work in tories but also that in mines and quarries, transport dertakings, agriculture, and fisheries. The industrial edical services are at present unevenly developed, but re is growing realisation that the health of industrial rkers should be safeguarded in their work-places as ll as in their homes. The reasons for this recognition not wholly altruistic, for it is now recognised that tput depends on the health and wellbeing of the rkers. In this period of transition it is not possible forecast the final form of the industrial medical vices, but it is likely that they will be integrated with National Health Service. In any case, many doctors the future will find their life's work in industrial or cupational medicine. University chairs devoted to e subject have been set up at Manchester and Durham, d readerships at Glasgow and Edinburgh. The chairs of social medicine at Oxford and Birmingham also include industrial medicine within their terms of reference, and students are likely to hear more about this subject in their undergraduate courses. Postgraduate courses are held from time to time in London, Birmingham, Sheffield, and Manchester. Diplomas in industrial health have recently been instituted by the Society of Apothecaries, the Conjoint Board of the Royal Colleges of Physicians and Surgeons, Edinburgh University, and the Faculty of Physicians and Surgeons of Glasgow.

Several Government departments deal with various aspects of the industrial medical services. For instance the Post Office, which employs more workers than any other department, has had a medical service since 1855; and since it deals with engineering and manual workers in addition to office staffs, it is partly an industrial medical service. The Ministry of Fuel and Power has a mines medical service, described below, which is responsible for the health of miners; in addition, the newly formed Coal Board is setting up its own medical service. The Ministry of Supply has a staff of medical officers which deals mainly with the health of workers in the Royal ordnance factories. The Silicosis and Asbestosis Medical Board, which used to deal with the diagnosis and certification for compensation of cases of silicosis, asbestosis, and some other forms of pneumoconiosis, has now been taken over by the Ministry of National Insurance. At present there are 20 whole-time medical officers, who carry out these functions in addition to making pre-employment and periodical medical examinations of workers in certain industries liable to produce silicosis and asbestosis. The organisation is being rearranged to comply with the functions of the Ministry under the Industrial Injuries Act, which came into force this year. A separate board consisting of 3 doctors was set up in Manchester in 1941 to supervise cotton-workers who develop byssinosis and to issue compensation certificates.

FACTORY DEPARTMENT

The main Government department supervising the health of industrial workers is the Factory Department of the Ministry of Labour and National Service. This department, which dates from 1833, administers the Factories Act, 1937, with its regulations on accident and sickness prevention, hours of work, amenities, first-aid and ambulance rooms, and canteens. The staff numbers about 350, of whom 16 are medical inspectors. All members of the department, whether lay or medical, take part in activities directed towards preventing illnesses and maintaining the health of the factory population. The medical inspectors are stationed in London, Birmingham, Sheffield, Liverpool, Bristol, Manchester, Glasgow, Leeds, and Wolverhampton, and from these centres they are able to deal with factory health and conditions in any part of the country. Under them 1750 general practitioners give part-time service as factory examining surgeons, examining all young entrants into industry, and periodically all those engaged in specified dangerous processes.

WORKS MEDICAL OFFICERS

At the end of 1945 there were 143 whole-time and 903 part-time factory officers. Compared with the 1943 figures, there were 33 fewer whole-time but 153 more part-time doctors engaged in industry. More recent figures are not available, but it can be said that the wartime expansion of factory medical services is being maintained in peace-time. At present works' doctors, except those in Government factories, are paid by private employers or firms; and the workers sometimes tend to distrust the doctors' opinions on this account. In a comprehensive medical service it should be possible to arrange that the doctor is employed by the State or by some other neutral body. Medical officers of factories who are interested in social problems have wide opportunities for their study and can also undertake the teaching of health and hygiene. They can strengthen the bonds between the factory service and the general medical and hospital services, treat accidents, reduce the chances of sepsis, follow up serious cases, and ensure that patients all return to work in the shortest time compatible with adequate treatment and reablement. Inevitably they will have to play an important rôle in the schemes for resettling disabled persons in industry. With their first-hand knowledge of the processes carried out and of the physical and mental capacities of the workers, they will be able to place the disabled persons in suitable jobs and keep them under observation.

RESEARCH

Apart from investigations and research into industrial diseases conducted by medical inspectors of factories, mines' medical officers, works' medical officers, and examining surgeons, much fundamental research into environmental conditions has been carried out by investigators of the Industrial Health Research Board of the Medical Research Council. Problems investigated include those of hours of work, lighting and vision, heating and ventilation, accident proneness, and sickness-absenteeism. The investigations have been mainly physiological and statistical, but clinical studies have also been made under the ægis of the Industrial Pulmonary Diseases Committee of the Medical Research Council, and include inquiries into the pneumoconiosis of coalminers and the byssinosis of cotton-workers. It became apparent that more clinical research into occupational diseases was needed, and the council in 1942 appointed a director of research in industrial medicine. In 1943 a department for research was established under the council at the London Hospital, and more recently, in conjunction with the Ministry of Fuel and Power, a bureau for research into pneumoconiosis among South Wales coalminers was established at Cardiff. Research into industrial-health matters is also being undertaken by the university departments mentioned above.

The Association of Industrial Medical Officers was formed some years before the war by doctors interested in industrial health, and branches have been established in various parts of the country; the *British Journal of Industrial Medicine* is sponsored by the A.I.M.O. in conjunction with the British Medical Association.

MINES MEDICAL SERVICE

THE Mines Medical Service of the Ministry of Fuel and Power since its inception in 1943 has consisted of a chief mines medical officer and his deputy at headquarters, and a medical officer in each of the eight main coal-producing regions of the country. These officers have been selected primarily on account of their experience of and qualifications for mining medical work; and by virtue of their special knowledge of the environmental factors in mines they act in an advisory and consultative capacity to the Minister of Fuel and Power and his administrative officers, H.M. inspectors of mines, mine managements, other Government departments, medical bodies, and others concerned.

The work of the mines medical officers is directed to securing that the health of the mine-workers is maintained at the highest level, particularly in relation to occupational factors. They are therefore concerned with supervision of medical arrangements (including first-aid) at mines themselves, and with ensuring that medical treatment and rehabilitation are available for mine-workers following injury or illness, and that these facilities are used to the best advantage. Where the provision of a necessary service falls short of need, it is their duty to propose improvements. They are also concerned with investigation and research into illness among miners.

During the war years, the Ministry of Fuel and Power's medical staff was necessarily concerned with certain temporary work, such as the medical aspects of recruitment and conservation of man-power. Certain permanent schemes, however, were put into effect, prominent among which is that whereby workmen who are injured at the mines, where they are often not readily accessible to a doctor, can have morphine administered to them by specially selected certificated first-aid men employed at the mines. Long-term policies were also developed, and some of these are now well established, such as the arrangements for medical examination of all entrants to coalmining below 18 years of age and the medical examination, including X ray, of all entrants, irrespective of age, to the South Wales coalfield. Another development of significance is the provision at certain mines of medical-treatment centres staffed by a State-registered nurse who will be under the direct supervision of a doctor. This scheme is already in operation at a number of mines; when it is functioning fully it will provide workers with early treatment of a very high standard.

Since Jan. 1, 1947, the National Coal Board has operated the coalmines of the country in accordance with certain statutory requirements, one of which is to secure the health of the persons they employ. To implement this requirement, the Board are in the process of engaging medical staff to advise them on matters of health and to exercise medical supervision of their employees by continuing the development of the scheme initiated by the Ministry of Fuel and Power. As the work of the National Coal Board doctors develops, the Ministry's Mines Medical Service will be freed to devote more of its attention to additional constructive work which has had to be left in abeyance while temporary but immediate problems were dealt with.

PRISONS AND BORSTAL INSTITUTIONS

AT the larger prisons whole-time medical officers are appointed, and at the most important ones principal medical officers are assisted by one or more medical officers. Salaries are in accordance with the general Civil-Service scales, and appointments are pensionable; unfurnished quarters are provided at most prisons, at a moderate rental. Preference is given to candidates with practical experience of psychological medicine and good all-round knowledge of general medicine and surgery. Appointments are made by the Civil Service Commission, 6, Burlington Gardens, London, W.1, to whom all inquiries should be addressed.

At the smaller prisons no whole-time medical officers are employed; local practitioners are usually appointed as part-time officers. Further particulars of these appointments can be obtained from the Prison Commissioners, Horseferry House, Dean Ryle Street, London, S.W.1.

Services Abroad

COLONIAL MEDICAL SERVICE

VACANCIES in the Colonial Medical Service occur most often in tropical Africa and Malaya. Medical officers must be British subjects holding medical qualifications registrable in the United Kingdom, and should have had at least twelve months' experience in hospital appointments since qualifying. Candidates for permanent service must have been born after Jan. 1, 1907, but contract appointments are also available in certain territories for doctors born before this date.

Medical officers are usually appointed in the first instance for general duties, which require all-round ability and a balanced outlook upon both preventive and curative medicine. Selected candidates may be required to take a course in tropical medicine and hygiene before proceeding overseas, or to attend such a course during their first leave. Some posts are purely concerned with public-health work, and for these the possession of a D.P.H. or some special experience in preventive medicine is necessary. There are ample opportunities for field investigation, while officers with special aptitude are encouraged to obtain such higher qualifications as will enhance their value to the Service. Officers possessing qualifications or experience in pathology would be considered for appointment to the laboratory establishment. Workers in this branch carry out pathological and chemical examinations for clinical, forensic, and public-health purposes, and also conduct researches into local problems. Specialist appointments and higher administrative posts are filled by the promotion of officers possessing appropriate qualifications and ability. There are occasional vacancies for medical women with experience in gynæcology and obstetrics, school health, and child welfare.

The total establishment of the various government medical departments amounts to about 700 European medical officers and about 1200 locally appointed medical officers. Depending upon the territory, such diseases as malaria, yaws, leprosy, sleeping sickness, plague, yellow fever, cholera, and other conditions associated with the tropics are encountered, in addition to the usual diseases of temperate climates. An officer in the Colonial Medical Service has special opportunities for the practice of preventive medicine, and there is ample scope for those interested in the clinical aspects of disease or in field research. The medical services will be considerably expanded in order to fulfil schemes for raising health standards in all colonies. Full particulars of terms and conditions of service may be obtained from the Director of Recruitment, Colonial Office, 15, Victoria Street, London, S.W.1.

SOUTHERN RHODESIA MEDICAL SERVICE

THE government of Southern Rhodesia maintains a medical and public-health service with an establishment of 19 whole-time administrative, specialist, or public-health officers and government medical officers. The rates of pay for the whole-time officers are:

	Annual salary
Secretary for Health	£1980
Director of preventive services; director of curative services	£1760
Regional medical officer of health; 2 directors of laboratories; medical superintendent, leprosy hospital; medical superintendent, mental hospital	£1485–£55–£1650
Senior schools medical officer; 2 radiologists	£1265–£55–£1650
Nutrition officer; radiologist; pathologist; psychiatrist	£1265–£55–£1430
Assistant medical superintendent, mental hospital	£1100–£55–£1265
Schools medical officer (man); 2 schools medical officers (women)	£935–£33–£1100

Government medical officers are graded as follows:

2 senior government medical officers ..	£1485–£55–£1650
48 government medical officers	£660–£27 10s.–£990

In addition to the salary scales shown, there is a cost-of-living allowance varying from £78 to £150 a year on a sliding scale. Children's allowances are also paid.

Whole-time medical officers and the two senior government medical officers are not permitted private practice but are allowed consultant practice. Government medical officers, except those stationed at Salisbury or Bulawayo, are allowed private practice, the value of which varies from £100 per annum upwards, according to the station. The duties of government medical officers include supervision of the 15 government hospitals and 76 native clinics, and attendance on police, boarders in government schools, and prisoners. They also undertake medicolegal work and public-health duties. Leave may be granted at the rate of one-eighth of service, and may be taken in periods not exceeding 184 days at a time. Study leave may also be granted. After two years' service medical officers under the age of 45 can be appointed to the fixed establishment, and contribute to a pensions scheme. The retiring age is 60. On appointment, government medical officers are usually stationed at Salisbury or Bulawayo, where they are paid an allowance of £200 per annum in compensation for not being allowed to undertake private practice. They are usually required to do relieving duties at various out-stations until appointment to a permanent post. Appointments in Great Britain to the service are made through the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2, who will supply further details on request.

SUDAN MEDICAL SERVICE

RECRUITMENT from England of medical inspectors is at present in abeyance. It is possible that there will be vacancies in the near future for posts carrying with them certain special duties, but no information about the terms of service and the experience required is at present available.

MEDICAL MISSIONARY SERVICE

CHRISTIAN medical men and women who wish to offer their services where the need is greatest will find opportunities in medical missionary work. There are university medical schools, central and rural hospitals, and many opportunities for public-health work and research. Christian missions can claim to have given China a modern medical profession. In India and Pakistan they have helped to maintain high ethical and professional standards, and have specialised in nursing education. In Africa and other primitive regions they have pioneered rural health services and the training of subordinate staff. All over the world the work is becoming integrated with the government services though still maintaining its identity. For undergraduate candidates for the service there are hostels in London and Edinburgh, and also various scholarships. At least eighteen months or two years of resident appointments is advised for all, and special diplomas or higher degrees for some. Special missionary training is also required by some societies. Service is for terms of from two to six years according to the country and climate; there are opportunities for postgraduate study during furloughs. Offers for life service are expected, but short terms are considered. Salary is on a missionary subsistence basis with allowances, free passages and quarters, and pension provision. There are schools for missionaries' children at home and in many of the fields. Applications from students or qualified men and women should be made either to the secretary of one of the denominational or interdenominational missionary societies, or through the local branch of the Student Christian Movement or the Intervarsity Fellowship, or to the Chairman, Medical Advisory Board of the Conference of British Missionary Societies, Edinburgh House, 2, Eaton Gate, London, S.W.1.

Postgraduate Education

In London

The BRITISH POSTGRADUATE MEDICAL FEDERATION is a school of the University of London. It coöperates with the Royal Colleges and other bodies in providing for postgraduates in London, supplementing the provisions at the undergraduate medical schools and teaching hospitals. The federation includes the Postgraduate Medical School at Hammersmith Hospital, with its university departments of general medicine, general surgery, obstetrics and gynæcology, and pathology, and institutes in the principal branches of medicine associated with the special hospitals. Appointments of the house-officer and registrar types in the hospitals and institutes provide the most valuable form of postgraduate education, and there are opportunities for research by selected graduates. In addition to the Postgraduate Medical School, the institutes included in the federation are those of psychiatry, neurology, child health, ophthalmology, laryngology and otology, diseases of the chest, cardiology, orthopædics, dermatology, urology, and dental surgery. These are in various stages of development, and the numbers of students that can be admitted to the clinical practice of some of the hospitals are limited. At all the institutes courses of instruction are given throughout the academic year; they are suitable for graduates in the early stages of their specialist education and also for those who have completed their practical training. Two or more years of hospital work in general medicine and general surgery after graduation are normally advisable before commencing work in the special branches. The work at the institutes is of an advanced type and is sufficiently comprehensive to enable graduates with suitable practical experience to prepare for higher degrees and diplomas. Emphasis is placed on clinical and laboratory teaching, supplemented by lectures and demonstrations.

The *Postgraduate Medical School of London* is associated with the Hammersmith Hospital, Ducane Road, W.12. The teaching in the clinical departments, based on ward work, is continuous and is supplemented by lectures during three ten-week sessions starting in January, April, and October.

with adequate treatment and reablement. Inevitably they will have to play an important rôle in the schemes for resettling disabled persons in industry. With their first-hand knowledge of the processes carried out and of the physical and mental capacities of the workers, they will be able to place the disabled persons in suitable jobs and keep them under observation.

RESEARCH

Apart from investigations and research into industrial diseases conducted by medical inspectors of factories, mines' medical officers, works' medical officers, and examining surgeons, much fundamental research into environmental conditions has been carried out by investigators of the Industrial Health Research Board of the Medical Research Council. Problems investigated include those of hours of work, lighting and vision, heating and ventilation, accident proneness, and sickness-absenteeism. The investigations have been mainly physiological and statistical, but clinical studies have also been made under the ægis of the Industrial Pulmonary Diseases Committee of the Medical Research Council, and include inquiries into the pneumoconiosis of coalminers and the byssinosis of cotton-workers. It became apparent that more clinical research into occupational diseases was needed, and the council in 1942 appointed a director of research in industrial medicine. In 1943 a department for research was established under the council at the London Hospital, and more recently, in conjunction with the Ministry of Fuel and Power, a bureau for research into pneumoconiosis among South Wales coalminers was established at Cardiff. Research into industrial-health matters is also being undertaken by the university departments mentioned above.

The Association of Industrial Medical Officers was formed some years before the war by doctors interested in industrial health, and branches have been established in various parts of the country; the *British Journal of Industrial Medicine* is sponsored by the A.I.M.O. in conjunction with the British Medical Association.

MINES MEDICAL SERVICE

THE Mines Medical Service of the Ministry of Fuel and Power since its inception in 1943 has consisted of a chief mines medical officer and his deputy at headquarters, and a medical officer in each of the eight main coal-producing regions of the country. These officers have been selected primarily on account of their experience of and qualifications for mining medical work; and by virtue of their special knowledge of the environmental factors in mines they act in an advisory and consultative capacity to the Minister of Fuel and Power and his administrative officers, H.M. inspectors of mines, mine managements, other Government departments, medical bodies, and others concerned.

The work of the mines medical officers is directed to securing that the health of the mine-workers is maintained at the highest level, particularly in relation to occupational factors. They are therefore concerned with supervision of medical arrangements (including first-aid) at mines themselves, and with ensuring that medical treatment and rehabilitation are available for mine-workers following injury or illness, and that these facilities are used to the best advantage. Where the provision of a necessary service falls short of need, it is their duty to propose improvements. They are also concerned with investigation and research into illness among miners.

During the war years, the Ministry of Fuel and Power's medical staff was necessarily concerned with certain temporary work, such as the medical aspects of recruitment and conservation of man-power. Certain permanent schemes, however, were put into effect, prominent among which is that whereby workmen who are injured at the mines, where they are often not readily accessible to a doctor, can have morphine administered to them by specially selected certificated first-aid men employed at the mines. Long-term policies were also developed, and some of these are now well established, such as the arrangements for medical examination of all entrants to coalmining below 18 years of age and the medical examination, including X ray, of all entrants, irrespective of age, to the South Wales coalfield. Another development of significance is the provision at certain mines medical-treatment centres staffed by a State-register nurse who will be under the direct supervision of doctor. This scheme is already in operation at a numl of mines; when it is functioning fully it will prov workers with early treatment of a very high standard.

Since Jan. 1, 1947, the National Coal Board operated the coalmines of the country in accordar with certain statutory requirements, one of which to secure the health of the persons they employ. implement this requirement, the Board are in the proc of engaging medical staff to advise them on matters health and to exercise medical supervision of th employees by continuing the development of the sche initiated by the Ministry of Fuel and Power. As t work of the National Coal Board doctors develops, t Ministry's Mines Medical Service will be freed to dev more of its attention to additional constructive wo which has had to be left in abeyance while temporary b immediate problems were dealt with.

PRISONS AND BORSTAL INSTITUTIONS

AT *the larger prisons* whole-time medical officers a appointed, and at the most important ones principal me cal officers are assisted by one or more medical office Salaries are in accordance with the general Civil-Servi scales, and appointments are pensionable; unfurnish quarters are provided at most prisons, at a modera rental. Preference is given to candidates with practic experience of psychological medicine and good all-roun knowledge of general medicine and surgery. Appoin ments are made by the Civil Service Commissio 6, Burlington Gardens, London, W.1, to whom a inquiries should be addressed.

At the smaller prisons no whole-time medical officer are employed; local practitioners are usually appointe as part-time officers. Further particulars of these appoint ments can be obtained from the Prison Commissioner Horseferry House, Dean Ryle Street, London, S.W.1.

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Services Abroad

COLONIAL MEDICAL SERVICE

VACANCIES in the Colonial Medical Service occur mo often in tropical Africa and Malaya. Medical offic must be British subjects holding medical qualificati registrable in the United Kingdom, and should have h at least twelve months' experience in hospital appoi ments since qualifying. Candidates for perman service must have been born after Jan. 1, 1907, b contract appointments are also available in certai territories for doctors born before this date.

Medical officers are usually appointed in the fir instance for general duties, which require all-roun ability and a balanced outlook upon both preventi and curative medicine. Selected candidates may b required to take a course in tropical medicine and hygiene before proceeding overseas, or to attend suc a course during their first leave. Some posts are pur concerned with public-health work, and for these th possession of a D.P.H. or some special *experience* preventive medicine is necessary. There are amp opportunities for field investigation, while officers w special aptitude are encouraged to obtain such hig qualifications as will *enhance their* value to the Servi Officers possessing qualifications or experience in pat logy would be considered for appointment to the labo tory establishment. Workers in this branch carry o pathological and chemical examinations for clinica forensic, and public-health purposes, and also condu researches into local problems. Specialist appointments and higher administrative posts are filled by th promotion of officers possessing appropriate qualificati and ability. There are occasional vacancies for medica women with experience in gynæcology and obstetric school health, and child welfare.

The total establishment of the various governmen medical departments amounts to about 700 Europea medical officers and about 1200 locally appointed medi instruction are given in this course, 100 of which are devoted to practical work; in connexion with it a series of 12 open lectures are given by leading authorities in their various specialties. The course in midwifery and gynæcology which began in July is constructed primarily for those who already have considerable experience in this specialty and are preparing for the M.R.C.O.G. Two courses in internal medicine, lasting 12 weeks, are held, starting in April and October of each year. These classes comprise lectures, lecture-demonstrations, clinical teaching, and clinical pathological demonstrations; they are suitable for graduates wishing to specialise in medicine or who require a refresher course in the current outlook on internal medicine. Two courses in general surgery are held each year, starting in March and October. These courses are of 4½ months' duration; they include lectures on surgical anatomy, surgical pathology, and selected surgical subjects, as well as clinical demonstrations and ward visits for the class in small groups. In addition to the Edinburgh Royal Infirmary, other general and special hospitals in the city coöperate in the provision of clinical teaching facilities. General practitioners' courses have been completely reorganised with the teaching either at the bedside or by means of lecture demonstrations. Emphasis is laid on recent advances in treatment, and free discussion as well as constructive criticism by members of the course is encouraged. The course held in May, 1948, was attended by 52 practitioners. Open postgraduate lectures of wide interest are organised in conjunction with the courses in surgery and medicine. An increasing number of overseas graduates are attending these courses and it is the intention of the board to provide a hall of residence as soon as possible. Courses are often booked up several months in advance, so those intending to apply should do so at an early date. Applicants should write, giving particulars of their medical qualifications and postgraduate experience, to the Director of Postgraduate Studies, University New Buildings, Edinburgh, 8.

GLASGOW UNIVERSITY offers full-time intensive postgraduate courses in medicine and surgery twice a year. The courses run concurrently, are each of eight weeks' duration, and begin in mid-April and mid-October. These courses consist of clinical meetings, pathological demonstrations, and lectures: they are primarily designed for candidates training for the higher qualifications in medicine and surgery. A short full-time intensive course in pædiatrics will be conducted from Sept. 6 to 17. Courses in ophthalmology, dermatology, and other specialties are organised when the demand arises, and are advertised from time to time in the medical journals. Recognised training in diagnostic and therapeutic radiology is also available.

For general practitioners refresher courses of a fortnight's duration are held four times a year: they consist mainly of clinical demonstrations, but include also a few lectures on modern therapy. The next course will be held in the latter part of September. All inquiries should be addressed to the Director of Postgraduate Medical Education, The University, Glasgow, W.2.

Some Special Courses

MEDICINE

The *Royal College of Physicians of London* holds a series of advanced postgraduate lectures, including some on pathology, biochemistry, &c. They are given four times a week apart from vacations. The lecturers are drawn from the provinces as well as London. The audience is limited to 200. Details can be obtained from the Secretary of the College, Pall Mall East, London, S.W.1.

SURGERY

The *Royal College of Surgeons of England* has arranged a number of lectures and demonstrations to be held at the college. In surgery two series, each of 12 lectures, will be given during October and April. In anæsthesia two series, each of 45 lectures, will be given during October–November and March–April; in addition, tutorial classes will be held. Two series in orthopædic surgery, each of 12 lectures, will be given during January and July. Between October and January, and also between March and May, there will be a series of 72 lectures and practical demonstrations in anatomy, applied physiology, and pathology. Lectures in oral, dental, and general surgery will be held in September and February–March; and lectures and practical demonstrations on the application of the basic sciences to dental surgery will be held in July and January–February. The college maintains a library, museums, and laboratories for the use of medical graduates from all parts of the world. Fellows and members enjoy these facilities by right, but they have also been made open, on suitable introduction, to other graduates of medicine, and to undergraduates. The Arris and Gale and the Hunterian lectures provide opportunities for the presentation of original work in anatomy, physiology, pathology, and surgery. The college awards several prizes for meritorious work, and fellowships for those who wish to engage in practical work or research. From next January residential accommodation will be provided for postgraduate students within the college.

At *St. Mark's Hospital*, City Road, London, E.C.1, surgeons wishing to specialise in proctology may attend a six-month course, and postgraduate students working for higher degrees may come for 1–4 weeks' whole-time study. Intensive courses, each lasting one week, are held in conjunction with the Fellowship of Postgraduate Medicine three or four times a year.

The *Royal College of Surgeons in Ireland* holds a two-month full-time course in surgery, beginning in April of each year. A one-year course has been instituted in anatomy, physiology, and pathology, as a preparation for the primary fellowship examination.

OBSTETRICS AND GYNÆCOLOGY

The *Combined Postgraduate Teaching School* of Queen Charlotte's Maternity Hospital and the Chelsea Hospital for Women was formed two years ago to make available postgraduate teaching in obstetrics and gynæcology at the two hospitals. Refresher courses have been held regularly at each hospital; and twice a year there have been intensive courses for those studying for the M.R.C.O.G. examination. In addition, postgraduates have been able to attend the practice of Queen Charlotte's Hospital for periods of from 1 to 4 weeks. From Oct. 1 the Combined Postgraduate Teaching School, in conjunction with the Postgraduate Medical School of London, is forming an Institute of Obstetrics and Gynæcology, under the British Postgraduate Medical Federation.

PUBLIC HEALTH

Most university courses in public health have now been revived. New requirements by the G.M.C. have caused universities to revise the course for this examination, which is now taken in two parts, the first leading to a certificate in public health (C.P.H.), taken after three months' work, and the second to the diploma. The *London School of Hygiene and Tropical Medicine* offers a course beginning in October and lasting nine months, and designed primarily for those intending to seek posts as medical officers of health. All vacancies for the full course for the diploma have been filled, and there is a waiting-list, but in view of the development and subdivision of medical work in the public-health service, some places in the course for the certificate have been reserved for doctors who intend to undertake public-health work other than that of a M.O.H. The *Royal Institute of Public Health and Hygiene* also offers courses for the diploma, conforming to the new regulations; the next course begins on Oct. 1.

PSYCHOLOGICAL MEDICINE

Courses for the diploma in psychological medicine are at present in abeyance at some universities. At the *Institute of Psychiatry* in the British Postgraduate Medical Federation, based on the Maudsley Hospital and Bethlem Royal Hospital, there are lectures, lecture-demonstrations, seminars, and practical work in the laboratories covering the relevant aspects of psychology, anatomy, and physiology of the nervous system, psychiatry of children and adults, delinquency, pathology of nervous and mental disease, and related matters. The subjects of these lectures, which are given during the university terms, are grouped so as to meet the needs of postgraduate students at different stages of training.

A course for the university diploma in clinical pathology, lasting one year, is available for a limited number of selected students. The department of radiology of the hospital provides courses for the diplomas in medical radiology of the university and the conjoint board. All these courses begin in October. Long-term and short-term tuition in anæsthetics is provided for a small number of students.

The *Institute of Cardiology* is associated with the National Heart Hospital, Westmoreland Street, W.1. Six appointments of the registrar type are offered each year to physicians in training as cardiologists who already have a sound grounding in general medicine. General physicians may enrol for full-time or part-time instruction for one term of approximately three months. There are three terms annually, commencing in January, May, and October. Three intensive courses of lectures and demonstrations, each lasting a fortnight, are held in February, July, and November. Twice a year a series of weekly lectures is held, chiefly for the benefit of general practitioners.

The *Institute of Child Health* is associated with the Hospital for Sick Children, Great Ormond Street, and the Postgraduate Medical School at Hammersmith Hospital; it also has an arrangement with the Queen Elizabeth Hospital for Children, Hackney. The institute provides tuition throughout the year in three terms of three months each, commencing in January, May, and September, and in addition a series of lectures by specialists and experts in various spheres is given each term.

The *Institute of Dermatology* is associated with St. John's Hospital for Diseases of the Skin, 5, Lisle Street, W.C.2. Clinical teaching takes place in the outpatient department twice daily. There are also facilities for study and tuition in the pathological laboratory, but owing to the restricted accommodation no ward instruction is possible yet. A short course of lectures is given in the summer months, and a longer and more systematic course in the winter. Clinical assistantships are arranged for more advanced students.

The *Institute of Diseases of the Chest* is associated with the Brompton Hospital, S.W.3. Students enrol for three months or more on what is at present an approximately half-time course. In special cases a whole-time programme can be arranged. There are three terms annually, commencing in January, April, and October.

The *Institute of Laryngology and Otology* is associated with the Royal National Throat, Nose, and Ear Hospital at Gray's Inn Road and Golden Square, W.C.1. A comprehensive full-time course lasting twenty weeks is held twice a year, commencing in January and July. A part-time advanced revision course lasting 10–12 weeks, suitable for students preparing for the higher qualifications, is held twice yearly, approximately from February to May and from September to November. There are a number of appointments open to students, after completion of basic training in the specialty, which give good opportunities for acquiring and extending clinical experience.

The *Institute of Neurology* is associated with the National Hospital for Nervous Diseases, Queen Square, W.C.1. More advanced students are appointed as clinical clerks in the wards or attached to special departments and the research laboratories. Two ten-week courses, which are whole-time, are held in the autumn and spring terms.

The *Institute of Ophthalmology* is associated with the Moorfields, Westminster, and Central Eye Hospitals. In addition to teaching by means of hospital practice, a routine lecture and tutorial course, lasting 4–5 months, is held twice a year commencing in March and October. Clinical teaching and lectures are given at a higher level for advanced students.

The *Institute of Orthopædics* is associated with the Royal National Orthopædic Hospital, Great Portland Street, W.1. The practice of both the central hospital and the country branch at Stanmore is open to postgraduate students. Selected students have opportunities for taking an active part in the work of the institute and the hospital and of spending in the institute up to two years of their training. A comprehensive basic course of six months' duration is held each year, commencing in October. Twice a year, in April and September, a one-week course in advanced clinical orthopædics is held.

The *Institute of Psychiatry* is associated with the Maudsley Hospital, Denmark Hill, S.E.5. Training normally covers 2–3 years after experience elsewhere in general medicine, and is based on responsible hospital duties under supervision. Regular series of lectures and demonstrations are given throughout each of the university terms; clinical training continues throughout the year and includes seminars and case discussions. Students who, because of previous experience, do not wish to take the comprehensive two-year course will be able to attend limited series of lectures and clinical instruction. There are facilities for original investigations under supervision in the clinical departments and in the psychological, neuro-anatomical, electrophysiological, and biochemical departments.

The *Institute of Urology* is associated with the combined school of St. Peter's and St. Paul's Hospitals, Henrietta Street, W.C.2. Three courses of fourteen weeks' duration are held annually, commencing in January, *April*, and September. An intensive two-week course suitable for students taking higher examinations is held in September and March. Limited numbers of clinical assistants are appointed in January and July each year.

It is essential for prospective students to make their arrangements well in advance. Those sponsored by their universities, governments, or other official bodies receive first consideration in the allotment of vacancies. Established specialists from overseas, here for a relatively short time, who wish to see something of the practice of this country, are always welcome: they are regarded as visiting colleagues, and the experts in their specialties are always ready to receive them and let them accompany them in their work and teaching. In addition, refresher courses for general practitioners are arranged at non-teaching hospitals in London and the home counties. The federation has a central administrative office at 2, Gordon Square, London, W.C.1, to which inquiries should be directed: An information bureau of postgraduate activities in London and other university centres is maintained.

The NORTH LONDON POSTGRADUATE MEDICAL INSTITUTE holds courses in advanced medicine, advanced surgery, and obstetrics and gynæcology; and instruction is given in pathology, anæsthetics, and radiodiagnosis. Clinical instruction is given at Bearsted Memorial Hospital, Chase Farm Hospital, North Eastern Hospital, North Middlesex County Hospital, and the Prince of Wales's General Hospital. During the coming academic year there will be eight-week courses in advanced medicine suitable for those taking the M.R.C.P. examination, and eight-week courses in advanced surgery suitable for those taking the F.R.C.S. examination. Further *information can be obtained on application to the dean,* Dr. J. Browning Alexander, the Prince of Wales's General Hospital, London, N.15.

The FELLOWSHIP OF POSTGRADUATE MEDICINE, which has an office at 1, Wimpole Street, London, W.1, provides general information on postgraduate work, and arranges courses of instruction as follows:

1. Weekend courses, occupying the whole of a Saturday and Sunday. These are given in various hospitals in such subjects as infectious diseases, industrial medicine, the rheumatic diseases, ear, nose, and throat diseases, *children's diseases, and clinical surgery.*
2. Courses specially suitable for, though not restricted to, candidates for the D.A., D.C.H., D.OBST.R.C.O.G., and F.R.C.S. (primary and final). These include general medicine, neurology, general surgery, proctology, midwifery, children's diseases, anæsthetics and anatomy, physiology, bacteriology, pharmacology, *and* pathology. Some are full-time courses, lasting 1–2 weeks. Others are spread over longer periods, taking place either in the mornings, afternoons, late afternoons, or evenings; they are intended particularly for postgraduates not free for full-time study.

In Scotland

The EDINBURGH POST-GRADUATE BOARD FOR MEDICINE, representing the university and the Royal Colleges of Physicians and Surgeons of Edinburgh, arranges programmes of graduate studies. Considerable development has taken place during the past year. The board now offers a comprehensive course in the medical sciences of anatomy, physiology, and pathology; 280 hours of

BRITISH MEDICAL STUDENTS' ASSOCIATION

This association was founded in 1940, and with the exception of five London hospitals its membership includes the student body of every medical school in England, Scotland, Wales, Northern Ireland, and Eire. It is a purely professional body whose sole object is to omote the interests of students, by providing a means communication between those at different universities the one hand, and with other professional organisations nd Government departments on the other.

One of the most valuable ways of fulfilling this aim in the organisation of clinical conferences, which are ld in university centres each year, and which give udents the opportunity to meet their colleagues from her schools, and to hear different teachers and see fferent hospitals. Previously organised only on a gional basis, the scope of these conferences has been tended during the past year, and in March a very ccessful national conference was held in London. second conference of this kind is to be held in Edinurgh in September. The programmes include lectures nd clinical teaching in general and special hospitals, sits to nearby centres, and social activities. An even reater achievement has been the organisation of the irst Students' International Clinical Conference, which as held this summer. Representatives of 24 countries pent a week each in London, Oxford, and Birmingham. t is hoped that this will be the first of a series held all ver the world.

The association publishes its own journal, and has epresentatives on various committees, such as those of he British Medical Association and the Scientific Film Association. It has organised exchanges with individuals and with groups of medical students abroad, and has arranged various other amenities, such as the coupon concession for white coats achieved by negotiation with the Board of Trade; through its central machinery students can obtain residencies at non-teaching hospitals during vacations.

The B.M.S.A. is now the acknowledged representative body for medical students. Its activities have, however, always been strictly confined to those calculated to promote the interests of medical students, *as medical students*. Nothing has been attempted, however desirable, which does not satisfy this condition. The uccess of the association and the greatly increased ecognition which it has achieved is largely attributable o the widening realisation of this limitation of its bjectives. Correspondence should be addressed to the ecretary of the association, B.M.A. House, Tavistock quare, London, W.C.1.

EMPIRE MEDICAL ADVISORY BUREAU

The British Medical Association has set up the Empire edical Advisory Bureau with a view to making the tay of overseas medical visitors to this country as rofitable and pleasant as possible, by welcoming them nd providing a personal advisory service. The bureau, which is at B.M.A. House, Tavistock Square, London, W.C.1, caters mainly for Dominion and Colonial medical men and women who are staying in this country for ostgraduate education or other purposes. Information s obtainable about postgraduate education and courses f study for higher qualifications; and inquirers can be ut in touch with the authorities of the teaching institutions. The visitor who wishes to see something of the atest medical work in his own specialty can be put in ouch with the appropriate experts.

A register of suitable hotels and lodgings is maintained y the bureau, and every effort is made to help visitors o solve the problem of finding somewhere to live. By ocial functions and in other ways doctors from the ominions and Colonies will be enabled to meet each ther and prominent members of the profession in this ountry. General information about travel, sports cilities, exhibitions, theatres, &c., may also be had. he bureau can be of greatest service to the visitor if he rites as long as possible in advance of arrival, giving nformation on the following lines: projected date of rrival, mode of travel, whether accompanied by wife, eriod of stay, objects of the visit, and in what ways assistance is desired. On arrival a letter of introduction from the local hon. secretary of the visitors' medical association, although not essential, would be welcome. The medical director of the bureau is Dr. H. A. Sandiford, to whom all communications should be addressed.

CHANGE-OVER IN THE CONTROL OF RADIUM

One of the effects of the National Health Service Act is that, after nearly twenty years' fine work, the National Radium Trust and the Radium Commission are coming to an end. The trust was created to augment the supply of radium (and later of radiotherapeutic apparatus) for medical treatment and to stimulate the advancement of knowledge concerning radium technique; whereas the commission's duties were to arrange for the custody, distribution, and full use of the trust's radium. It may be said that their birth in 1929 was certainly timely and their decease perhaps inevitable. The Royal Charter and the three supplemental charters under which they have worked are to be surrendered. Their duties will in future be undertaken partly by a Ministry of Health committee and partly by the regional hospital boards. Those who have shared in or witnessed the work of the commission may wonder whether there is likely to be a more practical way of organising the proper custody, equitable distribution, and full use of the radium publicly raised as a thank-offering for the King's recovery from illness than the way that was chosen. Since 1929 there has been a consistent effort to put expert opinion into direct practice in the organisation of radium therapy throughout the country, and the public have been well served by those who have willingly given their time to this end.

A wise decision was taken in 1929 to aim, not at creating a radiotherapy centre on the lines of the Institut du Radium in Paris or Radiumhemmet in Stockholm, excellent though the work of these institutions are, but to attempt the organisation of treatment throughout the country to the best practically attainable level. The first step was to set up national centres where radiotherapeutic departments of standing already existed, whose work was strengthened by the ancillary services inseparable from large general hospitals. Later, regional centres came into being as many parts of the country could not be served by the national centres. The support which the commission was able to give in putting this scheme into operation was extensive. Radium was loaned to the centres at a very low charge, they were given complete freedom to have this radium in any form which their clinical plans required, and their work was supplemented in many ways with a minimum of interference. One of the most successful features of the work of the commission was the way in which the members were brought into contact with the work of every centre by periodic visits; these were far from being mere visits of inspection for they served the dual purpose of keeping members abreast of the growing needs of the therapist and of reassuring every therapist associated with this national organisation that he had a good friend in the commission.

The criterion by which the work of the commission will be judged is whether the country would have done as well without it. To this there can be only one answer. When it began work our radium treatment lagged behind that of other countries, whereas now it bears comparison with any. The general level is high and many centres have contributed to important developments in technique which have stood the test of time. There is a fine spirit running through the radiotherapy departments of our hospitals, and, though it would be absurd to suggest that they created it, the Radium Commission has done much by fostering the conviction that the treatment of disease with radium was going to be well worth while.

At the Maudsley Hospital, Bethlem Royal Hospital, and associated hospitals and clinics, clinical training is provided throughout the year for a limited number of students in the various branches of psychiatry. Information can be obtained from the Dean, Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E.5.

At *Edinburgh University* candidates for the diploma in psychiatry (D.PSYCH.) are now required to spend at least three years in approved hospitals, clinics, laboratories, and other institutions. At the end of this period they attend an intensive five-week course before examination. Intending candidates should enter their names with the dean of the faculty of medicine before starting special study.

At the *Tavistock Clinic* the psychotherapy of both adults and children as outpatients, based on analytical concepts, which has characterised the clinic's activities in the past, is being developed, and particular attention is being given to group psychotherapy. In addition to therapeutic work the clinic and the associated Tavistock Institute of Human Relations are studying techniques in preventive psychiatry. These include mothers' discussion groups, selection techniques, and techniques for improving interpersonal relations in school and industry and similar psychological and sociological procedures.

In the clinic systematic training is at present available in the child-guidance department for a limited number of psychiatrists, educational psychologists, and psychiatric social workers. Facilities for training in the adult department will be advertised later. Further information may be obtained from the Training Secretary, 2, Beaumont Street, W.1. Organised training activities in the Tavistock Institute of Human Relations will probably be resumed this autumn; further information may be obtained from the Secretary, Tavistock Institute of Human Relations, 2, Beaumont Street, W.1.

The *Institute of Psycho-Analysis*, 96, Gloucester Place, London, W.1, provides training in psycho-analytic theory and technique. The course is part-time and lasts about four years. It includes a personal analysis, attendance at lectures and seminars (held in the evenings), and clinical work done under supervision. Students are required to obtain general psychiatric experience at other clinics and hospitals, since the institute does not set out to teach all aspects of psychiatry. Completion of the course to the satisfaction of the training committee qualifies the student for election as an associate member of the British Psycho-Analytic Society. In addition to this main course designed for those intending to specialise, the institute gives briefer courses from time to time on the application of the principles of psycho-analysis to medical problems. These are advertised in the medical press.

TROPICAL MEDICINE

A diploma in tropical medicine is required by those seeking appointments in the tropics. Courses are held at the *London School of Hygiene and Tropical Medicine*, the *Liverpool School of Tropical Medicine*, and *Edinburgh University*.

MEDICAL STATISTICS

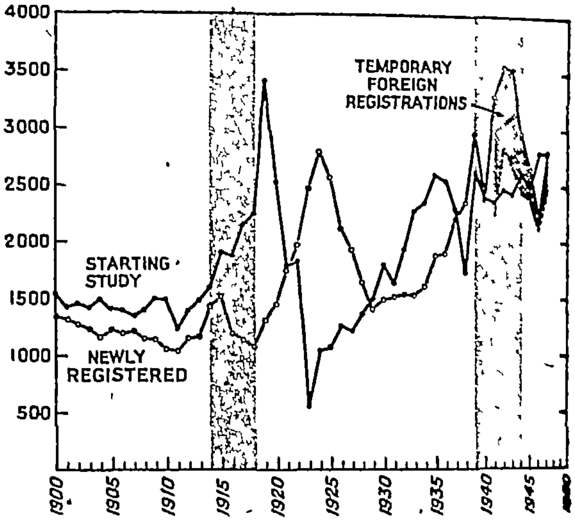
The department of medical statistics of the London School of Hygiene and Tropical Medicine offers a short course, occupying two days a week for three months, in the principles of medical statistics and statistical methods. The course is held during April to July. It may also be held during January to April if sufficient applications are received. Application should be made not less than one month before the course is due to begin to the Registrar, London School of Hygiene and Tropical Medicine, Keppel Street (Gower Street), London, W.C.1.

INDUSTRIAL HEALTH

At *Roffey Park Rehabilitation Centre* residential courses lasting one week are held for doctors, works managers, trade-union officials, and social workers. The syllabus is divided broadly under two headings: (1) maintenance of fitness at work, and (2) rehabilitation and resettlement. Classes are modelled on the lines of the open discussion group. Inquiries should be addressed to the Secretary, Training Department, Roffey Park, Horsham, Sussex.

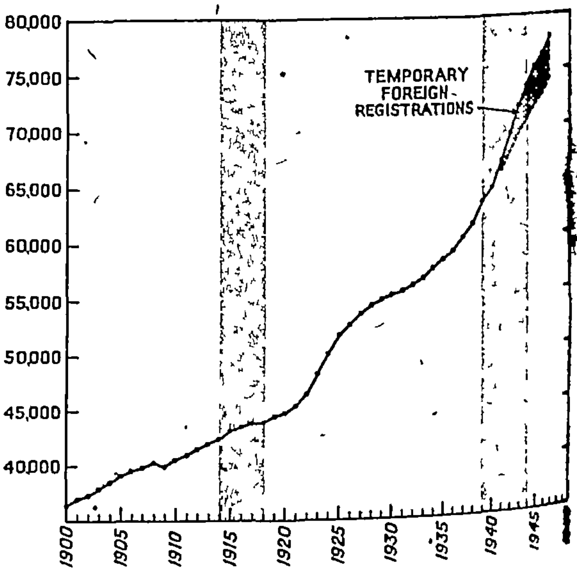
REGISTRATION

NO-ONE is a legally qualified medical practitioner unless his name appears on the Medical Register kept by the General Council of Medical Education and Registrat of the United Kingdom. The council is a standardis body, ensuring that there is a prescribed minimum of medical education and examination requirements; it is also responsible for discipline within the profession.



Numbers starting study and qualifying.*

The approximate number of second-year students admitted to medical schools in the United Kingdom and in Eire was 2498 during 1945–46, and 2793 during 1946–47; for the year 1947–48 the number was 2797. The number of newly registered in 1946 was 2237 and in 1947 was 2787. Doctors temporarily registered by virtue of Defence Regulation 32 B or of the Polish Resettlement Act, numbering 4561 (of whom about 4200 are registered under the Defence Regulation), have been enabled by the Medical Practitioners and Pharmacists Act to apply for admission to the permanent register, provided that they are resident in Great Britain. Up to the beginning of this month just over 400 had been so registered; the total number of applicants is about 1000.



Numbers on the Medical Register.

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* The numbers shown as starting study are taken from the Medical Students' Register up to 1938; and since then from returns made by the medical schools to the General Medical Council. Both forms of registration are incomplete, but latterly returns have been received from almost all schools.

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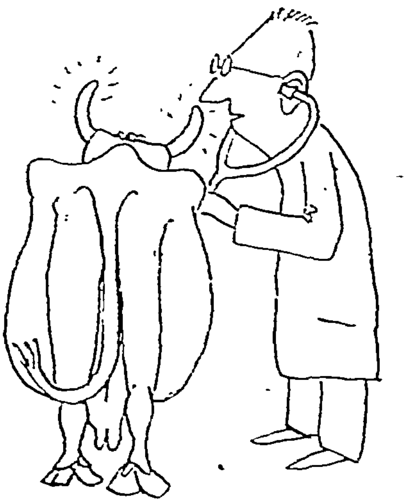

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IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents

AT that Mecca of Methodism, the Central Hall, Westminster, during the past fortnight hundreds of psychologists, male and female, young and old, from many nations, have been swarming up the big staircase to the International Congress on Mental Health, and the lobbies and hall have been a veritable Tower of Babel. Nothing could have contrasted more—or could it ?—with the aquarium which used to stand on this site or with the rather naughty music-hall which was here before that. Speakers in the discussions, trying to cram long papers into the allotted five minutes, were the bane of the smart young lady and the gentleman who gave a running translation for the benefit of the French-speaking psychologists. It was interesting how these psychologists had to soothe their nerves after speaking by smoking a cigarette. And it was interesting, too, to hear the various pronunciations of " ego." Personally, I was much relieved when one American psychologist so far descended from the heights as to talk about dropping banana skins, and when Lord Addison confessed to wanting 8 hours sleep in every 24.

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I spent the next weekend pitying myself, and on the Monday morning paid little attention to the wisdom of my chief on his round. At noon I had a brain-wave. I asked to be excused and shot round to the medical-school office. How about the " L.S.A." I asked : when could one take that ? The secretary told me there was a final exam. starting that very day, so I asked where the Apothecaries lived, jumped into the little Morris I kept in the hospital quad, and by 12.30 I was at their office. The exam. did not start until 2 P.M. But when I asked to take it they were politely firm : candidates must give at least 2 weeks' notice ; they must produce evidence of having attended a long list of courses and of having passed a long list of preliminary examinations ; they must pay 25 guineas—obviously I could not take the examination. In any case the secretary, who alone could admit candidates, would not be back from his weekend until after the paper had started. I said I would come back at 2 o'clock, though they told me it was useless.

I dashed back to the hospital in the old Morris and spent the lunch hour in collecting certificates. None, I swear, was actually forged, though one or two would not have borne very close inquiry. I also borrowed the 25 guineas, some of it in 5-shilling contributions from generous but penurious friends. I got back to Apothecaries' Hall at 1.55 to find that the secretary—bless him !—had returned sooner than expected. He heard my tale ; being young, I was very nearly in tears over it. He was sorry, but it was impossible, I must present myself next time. He went off to give out the papers, leaving me sitting sadly in his office. The clock ticked round, and at 2.15 I got up to go. Then I thought I would stay a bit longer, and at 2.30, when I had just decided it was no good, in came the secretary, with a broad grin, to say that the examiners had considered my case and were making an exception in my favour. He led me in, and I sat down dazedly to do the paper. I did not know on what subject it would be, and I did not care. I did not worry even when there was a clap of thunder and a terrific downpour and I remembered that my poor Morris was still outside with the hood down. At last I came out, to be met by a policeman who took my name and address for lea my car unattended in Queen Victoria Street. I told I had been taking an exam. unexpectedly, but I d think he believed me.

That was not quite the last hurdle, for the results were due on the very evening when the committee met to appoint the new house-officers. I had a friend in committee who promised to stay behind to take application if the result was favourable and was out time. It was a near thing—twice over, in fact—for I just passed in forensic medicine, and the verdict announced with ten minutes to spare.

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Afterwards we dressed and had our picnic lunch in the shade of a bamboo clump on the river bank. We were just polishing off the tinned peaches and lighting cigarettes when a troop of young negroes appeared, holding a net strung out across the river and wading up-stream towards us. They were shouting to one another, waving brown arms and cutlasses, with which they every now and then beat the water or burrowed excitedly under rocks. As they came closer, we saw that one of them carried a clump of fish strung together—mullet, lanky crayfish all brown and spiny, and flatfish with the disc-like suckers with which they cling to the rocks. The youths were marvellous physical specimens, wearing only shorts, with enormous shoulders and pectoral muscles, and as they came crowding round us to display their catch their amiable grins showed wonderful sets of teeth. One lad who had been naked had modestly wrapped a friend's shirt round his waist before approaching. We admired the fish and gave them some cigarettes and the remains of our food, which vanished like magic.

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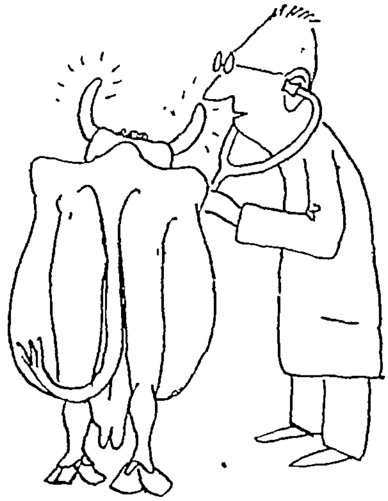

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Notes and News

THE PENSIONER IN HOSPITAL

UNDER the National Insurance (Overlapping Benefits) ulations a patient who has been eight weeks in hospital l find that his sickness benefit or pension is cut by ten llings a week, and that after a year a further reduction l be made. But in a letter to the *Times* this week (Aug. 24) correspondent suggests that a pensioner should not be alised for sickness and asks how he is to meet his rent and tine expenses. The reduction is based of course on the nciple that the pensioner is receiving board and lodging the hospital and his day-to-day expenses should therefore reduced. But the pensioner is probably living on a very all margin and besides the small extra expenses which ays go with a stay in hospital he must probably pay at st a retaining fee if he is to have a home to return to when comes out of hospital. The position of the chronic invalid o has entered an institution is different, but as the *Times* mperately points out in a leading article: "it is not ogether easy to justify any reduction in the benefit of the tient, however long his illness, who still has a home or pendents, and a reduction after only eight weeks in hospital indefensible."

POLIOMYELITIS FIGURES

THE final figure for notifications in the week ended Aug. 21 likely to be 70–75, compared with the level of 35–40 in the st few weeks. A seasonal rise has often occurred at this me of year; but last year the rise began very much earlier in the week ended June 7.

PRESCRIPTIONS FOR N.H.S. PATIENTS

THE Ministry of Health suggests that there is considerable misunderstanding among doctors as to the use of the official prescription form, E.C.10. This may be used only by doctors ho have agreed to give general medical services under the ct, and only for patients who are on their lists or have been ccepted as temporary residents. A separate form must be sed for each member of the family. Only medicines, or he appliances and reagents named in the third schedule to he National Health Service (General Medical and Pharmaceutical Services) Regulations, 1948, can be ordered on rm E.C.10; it may not be used for private patients, for rdering foods and food-like preparations or appliances ot in the prescribed list, or for obtaining stocks of drugs appliances required by the doctor in his practice, which ould be ordered from a wholesaler or local chemist in the ual manner.

PIONEERS OF PURE FOOD

FOOD adulteration was a tempting sport for the middleman rough the ages, until legislation came to check him and otect the consumer. Mr. F. LE GROS CLARK has lately ared evidences of the practice from the 14th century and viewed the stages of reform.[1]

Millers and bakers, he says, were particularly knavish, lding mouldy flour, bean-meal, alum, chalk, and whatnot their flour—for which, if they were detected, they might e fined and put in the pillory with the offending loaves ng about their necks. Pepper and spices, ginger, cloves, nd saffron, all inspired the merchants to spin out quantity conceal age. Tea and coffee were sophisticated almost as on as they began to be imported, which roused the 8th-century pamphleteers. The bakers, too, were still in ad odour, and were plagued with broadsheets and lampoons own to the end of the Napoleonic wars. But a more ormidable assault was being prepared. In 1820, Frederick ccum, a competent chemist, published a book on adulteration hich dealt with alum in flour, the poisonous colouring of onfectionery, and the adulteration of beer: and this reliable ork ran through four editions. His charges were repeated 1848 by John Mitchell, and were taken up by Thomas akley, editor and founder of THE LANCET, and at that me a member of Parliament of many years' standing. In 851 Wakley set up a LANCET commission to analyse common ods and publish results, and in this task he was helped y Dr. Arthur Hassall and by Henry Letheby, lecturer in emistry at the London Hospital. For four years Wakley ublished articles on the commission's findings, and in 1855 athered them into a book *Food and its Adulteration*. Hassall found half the milk samples diluted with water, every sample of sugar mixed with lime, lead, or sawdust, every sample of mustard with flour and turmeric, and every loaf sophisticated with alum. Three-quarters of the cocoa samples contained added starch, and tea had been treated with indigo, black lead, and mica. Used leaves had been sold with a mixture of sloe and bay leaves, doctored with iron sulphate and gum, as finely blended tea.

The result of these exposures was a steady growth of protective legislation, culminating in the consolidating Act of 1938, and the Defence (Sale of Food) Regulations of 1943.

JUNK PLAYGROUNDS

OLD Kaspar's grandchildren, with a battlefield for playground, sported contentedly with a skull, and probably used bones for building houses. Children have long recognised the constructive possibilities of junk of all kinds, and greatly relish woodyards, sawpits, quarries, brickyards, and bombed sites—a fact which those who design asphalted municipal playgrounds, set orderly with swings, have quite failed to appreciate. The idea of the recognised, official, and well-equipped junk playground comes from Denmark, an account of one, originally published in *Picture Post*, has lately been reprinted in *Out of School*,[1] the second report of the Central Advisory Council for Education. This Danish playground is provided with stone, earth, bricks, wood, iron, clay, water, planks, empty petrol-cans, wheelbarrows, and derelict motor-cars—an exceedingly popular type of equipment. The children are taught the use of tools, and then build what they fancy. The playground leader examines every finished house, tower, or cave, to make sure it is safe before the children play in it. They make their own furniture, their forks and spoons, their kitchen utensils, and decorations. Some of the older children have built a climbing apparatus 35 ft. high and a working windmill. The leader in this playground is a nursery-school teacher who was formerly a seaman; his task is to help the children to understand the problems their projects entail, and to put them in the way of learning how to do it: they do the rest. During the three years the playground has been running there has been no serious accident; the children find out for themselves how far they can go with safety.

The idea of junk playgrounds is warmly supported by the National Under Fourteens' Council. In a well-illustrated pamphlet[2] they suggest what might be done to develop them here. The bombed site is, of course, one of the many places where such playgrounds could be set up; and they are particularly needed in towns where children often have no playgrounds near their homes. Naturally it is necessary to consider possible sources of danger, such as unsafe walls, service mains, and basements. Where preliminary clearing must be done, the children who are to use the site should help; and plenty of tools, scrap materials, and gardening equipment are wanted. In a foreword to the pamphlet Lady Allen of Hurtwood points out that much delinquency can be traced to boredom. Here is a playground suited to the active and inventive child. Those who plan municipal playgrounds, she says, "should consider the needs of the children before they put set-squares to paper, or spread relentless asphalt over the earth."

Those who are interested in the N.U.F.C. project, or who would care to contribute to it in cash or kind, are asked to write to the organising secretary, National Under Fourteens' Council, Mary Ward Settlement, London, W.C.1.

THE PARTIALLY SEEING CHILD

WHILE special arrangements have long existed for the education of blind children, no such provision was made for the partially sighted until the early years of this century. Children who could not read ordinary school books were educated as though they had no vision at all until James Kerr, medical director of the London School Board, invited Mr. Bishop Harman to investigate the position. He found that many of the children in the blind schools had been placed there because of high myopia, and he recommended that these children should be removed and given special education better suited to their needs. And so, in 1908, in a little one-story building in Camberwell attached to a general school, began the first class in the world devoted entirely to the education of partially sighted children. Since those days the views of ophthalmologists on the care of immediately ensued, and a slamming of doors indicated the exit of the valuable material. The hunt led to the nearby playground where after some coaxing the two younger members were persuaded to hold their hands warily through the railings. Once again dysplastic thumb-nails indicated that the chase must be continued, though fortunately the early return of the remaining daughters to the house saved me from having to utilise the swings and other apparatus to obtain their confidence. Finger-nails were then minutely studied with a hand lens, knees inspected, and buttocks palpated; and all five small daughters, together with their married sister and her newborn baby, turned out to be built on a similar pattern.

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[1] *Food Manufacture*, 1948, 22, 551; *Ibid*, 23, 11.

[1] London: H.M. Stationery Office. 1948. Pp. 39. 1s.
[2] Junk Playgrounds. Pp. 12. 6d.

The atmosphere of hostility, aggravated by my use of the term "abnormal," which had been wrongly interpreted as referring to their mental equipment, now changed to one of stark incredulity, as if they were standing before a benign lunatic. How could I explain to them about genes, mutation, and the chromosomes? It was hopeless. However, by a stroke of luck I mentioned that a report on them might appear in print. Instantly my quest assumed a new dignity, and when I left the family were feeling immensely important and certain of impending fame.

* * *

Letter to a Nephew

MY DEAR CHARLES,

I am flattered that you should ask for my advice before finally deciding to take up medicine, but I must warn you that no easy straightforward answer will be forthcoming. Whether you are likely to do well in medicine, and if so whether I recommend general practice—these things depend entirely on what you are.

Let me begin with a few questions. In the first place, why medicine at all? Have you chosen it in compliance with the family tradition, or do you feel the vocational urge, or are you after a worth-while job which will enable you to realise such ambitions for power, popularity, and the like as you may have? I mention three usual reasons for taking up medicine, but with your robust personality perhaps we can eliminate the first two. In my opinion, for what it is worth, pressure from without is a third-rate reason for becoming a doctor, though you will win the approval of your immediate environment if you profess to be swayed by it. As for the vocational urge, to tell you the truth I think it is just a little unhealthy; it is not characteristic of a person who will withstand strain and carry responsibility with ease. At any rate, rest assured that I regard a desire to secure a decent livelihood, with or without other ambitions, as a very good starting-point; and you will find that most men who do well in general practice set out with some such aim in view. This stamps them as life-sized human beings with understandable values and motives, and it allows them to get on with their work unhampered by tensions such as fixed goals and high ideals engender. The less you court disillusionment in advance, the better.

If you have the ability to qualify—and it has to be fairly good ability these days—you will be confronted by your next choice. There is no need to ponder the problem unduly at this stage, for you will find that your own personality will solve it for you; if you are restless and ambitious enough, you will disregard circumstances and strike out on your own, probably becoming a specialist or scientist. If your urge meets with an odd chance you may find yourself in a local-government post of some kind, and if nothing urges you away from the path of least resistance you will probably try general practice. Do not make the mistake of imagining that anyone can succeed in general practice. It is a test of quality and endurance not met in the specialised branches of the profession.

You will be successful if you are loved and trusted, and you will be loved and trusted if no character fault stands in your way. So far as I am aware you have none, but if you had, general practice would soon bring it out and you would have to make the best of it as an indifferent doctor. There are a number of these, and only exceptional piece of luck will enable them to get out general practice and possibly make good elsewhere. M of them will remain minor or major misfits, and the advice one can give them is that they should cut their l and stick to jobs well within their capacity. Locums and assistantships offer a very reasonable living with imposing the strain which will tax a less-than-heal personality to breaking-point. Within such limits indifferent doctor can still be an adequate doctor.

However, let us suppose that you will make a su of it. You will want to know something about a succ G.P.'s life. Have you ever wondered, Charles, what is that sustains the good family doctor, and how contrives to look flourishing and serene on hurried m interrupted nights, and a permanent load of respo bility? It is something of a miracle surely, for you m remember that he deliberately clings to a calling w makes the most extraordinary demands on him: he to make instant and serious decisions when woken in the middle of the night; he cannot afford to feel ill or too tired to see the patient who needs him, ticularly when the patient is seriously ill; and yet will be his breezy and affable self in surgery the next morning no matter how he spent the night. Is he superman, or an oddity intent on amassing money I hope you are dismissing these wild conjectures.

Try asking yourself why you send for one particular man when you are anxious and distressed. From him you expect something more than medical skill; and the greater your predicament, the more you depend on the support and reassurance of one personality rather than any other. Why? If you examine the question realistically you will find that you have placed your confidence not in a saint or a freak, but in a wise, kindly, reliable human being. His humanity will be obvious to you from what he has to give, but that is only one half of him; you must now ask yourself what he takes, for you cannot give him human stature by just assuming that he is "made that way," that he will be quite happy as long as he can go on giving. So far from being negligible, his takings are the real secret of the driving-force which sustains him; but what are they? Well, it rather satisfactory to have people depend on you, h upon your every word, regard you as a friend, and p their confidence in you. You like dealing with them, you give affection in return, you move and work in a friendly tension-free atmosphere. In short, it is the much maligned doctor-patient relationship, which I have tried hard to avoid mentioning since you have heard so much about it already and are very pardonably sceptical of it. Nevertheless, it is a relationship emotionally so rich and satisfying that it will keep your doctor vital and happy and it is of an order which constitutes an end in itself. It has nothing whatever to do with medical ethics, finance, or methods of administration; if you like, you can call it love, though you will need to interpret the word rather carefully. Perhaps it will help if you imagine yourself as a doctor in relation to a household which you can transform by your mere presence in the sick room; what does such a household give you? It has placed implicit trust in you in preference to anyone else; it gives you affection and respect, and it invests you with enormous power—power which overwhelms you at first and makes you feel rather humble. You can change the tenor of their lives with it, not necessarily by curing the sick, but by infusing your strength and courage into them so that they will accept the inevitable with something like triumph instead of helpless dejection. I ask you, could any effort of yours be called unrewarded with all these gifts spread before you, and could you name any reward which you would rather have? Well, Charles, shall we say it's worth it?

YOUR AFFECTIONATE UNCLE.

ACCIDENTAL INTRA-ARTERIAL INJECTION OF DRUGS

SOL. M. COHEN
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943, while I was working on traumatic arterial
my attention was drawn by Prof. R. R.
osh and Colonel Hedley Atkins to several tragedies
ng the accidental intra-arterial injection of
thiopentone ('Pentothal Sodium.') The cases
of interest not only from the point of view of
ed for a rationale for the management of such
but also because they suggested a means for
ing traumatic arterial spasm experimentally.

eview of the cases has shown that, though spasm
ajor vessel does not usually follow such injection,
velopment of extensive thrombosis (often late),
arteriolar spasm, and severe œdema presented
ms commonly met with in arterial injuries and
e. This paper is concerned chiefly with the detailed
of eight unpublished thiopentone cases and includes
analysis of four of the published cases in which it has
ossible to obtain pathological material, and further
s of the findings at operation and the treatment.
ted cases of tragedies following intra-arterial
ions of diagnostic and therapeutic media are also
ved.

ish to emphasise first of all, from a close study of the
records and first-hand accounts from the anæs-
sts, that these tragedies in no way reflect on the
thetists' competence and are not necessarily due to
essness or bungling. This accident can happen to
ne. One anæsthetist has had the misfortune to be
nsible for two such tragedies; and in one hospital,
gh the hazard was well recognised, there have been
tragedies and four other cases in which the injection
almost certainly intra-arterial but fortunately with
toward results. The case-records indicate that there
been little groping for the vein, and the injection
ften been particularly easy. Intra-arterial puncture
t followed, as is commonly imagined, by a gush of
l blowing off the syringe piston; those who have
arteriograms know that definite aspiration is often
ired. Nor is the crimson livery of arterial blood
ily discerned in the yellowish solution. Moreover,
anæsthetist usually aspirates, momentarily only,
ere wisp of blood—and this under difficulties, for
is seldom permitted the luxury of a decent light
le giving his injection.

ontrary to what is taught, puncture of the arterial
l is usually painless. I have done numerous arterial
ctures for arteriography under local anæsthesia and,
test this point, have confined the anæsthetic solution
the skin only. The puncture alone is not felt; the
ima appears to be insensitive. Large vessels may be
nlessly tied. Puncture of a vessel is painful only in
case of arteries covered with a network of sensory
ves—e.g., the radial and common femoral. Lewis
42) has shown, in animals, that barium chloride
cted into the arterial lumen is painful only if allowed
reach the distal capillary tree. One finds the same
g in brachial arteriography: when 35% diodone
njected with the arterial circulation arrested by an
ated tourniquet, no pain is felt until 4–5 ml. has been
cted; the patient then complains of a hot burning
n in the hand and fingers, and this continues as long
he tourniquet is kept inflated. Radiography shows
t this small amount is adequate to fill the entire
al arterial tree. The pain is similar to, though not
vell marked as, that following intra-arterial thiopentone; the quantity (4 ml.) represents the minimal amount of 10% thiopentone that has hitherto been reported to be followed by serious effects. It is a pointer to the anæsthetist to inject, as has been recommended (Macintosh and Heyworth 1943), say 2 ml., and pause a few moments for any complaint of pain.

It is strange that complications such as extensive thrombosis should follow injection into the swiftly moving arterial stream; for, if thiopentone was such an irritating corrosive, a far higher incidence of venous thrombosis would be expected, the venous tree, as every surgeon knows, thromboses all too readily on any damage. The explanation for this I do not yet know; but several factors may be responsible: the resistance of the arterial wall due to its relatively abundant muscle and elastic fibres; the temporary arrest of the arterial circulation by the inadequate release of the "venous" tourniquet; and the trapping of the solution in the arterial tree by vigorous flexion of the elbow after the injection.

SIGNIFICANCE OF VENOUS THROMBOSIS

Venous thrombosis, as Adams (1944) points out, is usually delayed; coming on from the fifth to the tenth day, and with a 5% solution there has been an incidence of 10 in 10,000 administrations; with the $2^{1}/_{2}$% solution the complication is rare. In this country, Evans (1939) and Payne (1939) have reported isolated examples; Solomons (1945), using a $2^{1}/_{2}$% solution, reported an incidence of 1 in 700 in acute battle casualties in a tropical area. The question has arisen whether extensive venous thrombosis may not alone lead to limb gangrene, for this is known to have followed the accidental injection of sclerosants into the deep veins of the leg (Erb 1944, Foote 1945, Luke and Miller 1948).

In several of the thiopentone cases the site of vessel puncture could not subsequently be found at operation, and there appears to have been no arterial leakage whatsoever. This is surprising, for anyone who has done arteriography will have observed that the vessel leaks considerably, the adjacent adventitia is usually heavily stained, and, even if the vessel is compressed rapidly after withdrawal of the needle, a hæmatoma bleb invariably forms in the adventitia. However, in some of the recorded tragedies following arteriography the puncture site has likewise not been visible (Leveuf 1938).

Deep venous thrombosis cannot be lightly dismissed as a possible factor responsible for death of the limb or other serious complication, such as Volkmann's contracture. Leriche (1945), Cohen (1946b), and Fontaine and Forster (1946) have commented that when the arterial circulation is poor, or in spasm, the onset of venous thrombosis will seal the fate of the limb; the increased venous pressure raises the intracapillary pressure, bringing the local circulation to a standstill. Venous obstruction alone, it is now believed, may lead to death of muscle from Volkmann's ischæmia; microscopically, the picture differs somewhat from that of the arterial lesion (Griffiths 1940), but the end-result—extensive fibrous-tissue infiltration—is the same (Bowden and Gutmann 1945, Albert and Mitchell 1943). Such deep thrombosis following prolonged blood-transfusion for severe hæmatemesis has been followed by Volkmann's contracture in the transfusing arm (F. R. Kilpatrick, personal communication). After the injection of thiopentone the venous thrombosis may be extensive and involve the deep veins as well by retrograde flow. With intravenous injection at the elbow phlebography shows clearly (fig. 1) that the solution does not merely continue its flow in equable fashion in the punctured vein but also owing to the situation of the vein valves, descends a considerable distance into the forearm and then spills over into the main interlacing venous net. Hewspear (1945) has described in detail a case where extensive myopic children have changed: it is now agreed that a reasonable amount of reading and writing under the best conditions does not cause myopia to advance, and that heredity and feeding are more important influences. But the schools for the partially sighted are doing invaluable work for children whose visual acuity is reduced from other causes, such as cataract and hereditary anomalies, as well as very severe myopia. Children whose vision in the better eye is between 6/18 and 6/60 are suitable for these classes provided their mentality is normal. Since these children are helped by *taking some oral lessons in company* with their normal-sighted colleagues the special schools are usually attached to an ordinary elementary school.

The idea of these schools spread from England to Europe in 1911 and to the U.S.A. in 1913. Mrs. Winifred Hathaway,[1] associate director of the National Association for the Prevention of Blindness in America, has set out the latest methods, which, as one would expect, have achieved a high degree of *ingenuity and mechanisation in the U.S.A.* For instance, the lighting in the class-rooms is controlled by a photo-electric cell which turns on lights automatically whenever foot-candles fall below an indicated level. Much work remains to be done and more classes are needed; thus in the U.S.A. it is estimated that 50,000 partially seeing children still lack opportunity for proper education. Local authorities in Britain who think of starting such classes cannot do better than read Mrs. Hathaway's wise words, for she has something sound to say on all aspects from transport to finance, and from talking books to clay modelling.

Society of Apothecaries of London

At a court of assistants held recently Prof. E. C. Dodds, F.R.S., was re-elected master for a further year, and Mr. Duncan Fitzwilliams and Dr. Frank Howitt were elected wardens. Dr. Reginald Fisher was welcomed to a seat on the court. Nelson Courtney Lendon was clothed by the master with the livery. R. J. Mather was bound apprentice to Sir Cecil Wakeley for four years. The following were admitted to the freedom of the society:

R. F. B. Bennett, P. M. F. Bishop, D. C. Muir, Richard King-Brown, J. W. Brown, J. St. C. Elkington, B. G. B. Lucas, J. B. Stanton, R. St. J. Buxton, Bartholomew Hynes, J. W. McCloy, R. H. W. Britton, George Richards-Smith, A. G. Hucker (by redemption); W. H. D. Fairbank (by servitude); A. C. Townsend (by patrimony).

The following were sworn in as examiners:

Dr. Kenneth Harris (medicine); Mr. A. Wallis Kendall (surgery); Prof. F. Goldby (anatomy); Prof. T. H. Barcroft (physiology); Prof. W. H. Linnell (chemistry).

The following diplomas were granted:

Mastery of Midwifery.—G. H. Hall, R. Hodgkinson, J. I. Miller, G. F. Newbold, C. M. Stacey, M. O. Will.

D.I.H.—J. N. Heales, C. H. Hoskyn, W. A. B. Reynard, D. G. Robinson, S. J. M. Walker, F. Wrigley.

L.M.S.S.A.—O. B. Beardsley, J. A. W. Berryman, A. I. Berwitz, A. C. Bojó, W. Bust, G. Capper, D. Davis, E. R. Ettlinger, K. H. Ghobrial, A. J. Glyn, P. G. Green, A. D. Griffith, N. Kacas, N. B. Kenyon, S. P. Lapage, D. F. Little, R. J. F. Moore, B. Newton, N. Rivers, V. E. S. Rolfe, M. V. Salmon, R. J. H. Snelson, J. S. Swifte, F. R. Walker, W. Winterstein, W. B. Wolstenholme.

St. Thomas's Hospital Dinner

The Old Students' dinner will be held at the Grocers' Hall, Princes Street, London, E.C.2, on Friday, Oct. 1, at 7.30 P.M. Mr. W. G. Howarth will be in the chair.

Boards of Governors of Teaching Hospitals

Recent changes of membership in these boards include the appointment of Sir Drummond Shiels to the board of the Hammersmith, West London, and St. Mark's Hospitals and of Prof. H. V. Dicks to the board of the National Hospitals for Nervous Diseases.

Extra Rations for the Tuberculous

The Ministry of Food announces that patients with active tuberculosis who receive additional allowances of milk, cooking fat, and bacon are now to be also allowed an extra 3 oz. of butter/margarine and an extra 3 eggs a week. Those eligible should take or send their ration books to their local food office to obtain the necessary permit. Sanatoria and hospitals can obtain the extra allowances for each of their patients with active tuberculosis.

Central Mediterranean Force Surgeons and thetists Dinner

The annual dinner of the surgeons and anæsthetists served in the Central Mediterranean Force will be held Claridge's, Brook Street, London, W.1, on Sept. 23 at 7.30 Tickets may be had from the secretary, 4, University Squ Belfast.

Medical Films

In connexion with the international scientific film co which is being held in London from Oct. 8 to 12 the Scien Film Association are arranging three morning sessions viewing and discussing medical films. Two meetings be held at 1, Wimpole Street, W.1, on the 8th with Sir Ke Goadby in the chair, and on the 12th with Dr. E. Go Rawlinson in the chair. On the 9th, at 1, Lambeth Street, S.E., Dr. Ronald MacKeith will preside over a de stration of methods of still and cine-photomicrography. organisers invite owners of medical and biological films w they would be willing to lend to write to the org specialist medical sessions of the congress, 34, Soho Sq W.1. Applications for admission should be sent to the address.

Surgeons' Gowns and Coat Overalls

Private practitioners who undertake operations, obste venereal disease treatment, or autopsies, can receive co equivalent certificates for gowns. This now also applies those who do their own dispensing, and to pathologists. Board of Trade have agreed that industrial coat overalls be bought instead of surgeons' gowns. Practitioners ent or returning to practice can get certificates to buy up gowns or coat overalls. Those already in practice may an annual replacement of 3 gowns or coat overalls. Doctor England and Wales can apply for certificates to the Mini of Health, Whitehall, London, S.W.1; in Scotland, to Department of Health for Scotland, St. Andrew's Hou Edinburgh; and in Northern Ireland, to the British Med Association, B.M.A. House, Tavistock Square, London, W.

Appointments

DAVIDSON, WILLIAM, M.B. Leeds, D.M.R.D.: asst. radiologist, R Halifax Infirmary.

KENDALL, A. C., M.B. Birm., M.R.C.P.: registrar (B1), pædi department, Radcliffe Infirmary, Oxford.

* LOVETT, W. C. D., M.D. Lond., B.SC. Wales, D.P.H.: M.O. (h duties) British Somaliland.

SWAN, J. F., M.D. Glasg., D.OBST.R.C.O.G., D.P.H.: M.O.H. school M.O., Bootle.

TELLING, MAXWELL, M.A., D.M. Oxfd: asst. physician, Ge Infirmary, Leeds.

WALKER, J. H. C., B.A., M.B. Dubl., D.P.H.: bacteriologist, P Health Laboratory Service.

YOUNG, R. V., M.A., B.M. Oxfd: clinical pathologist, Horton Ge Hospital, Banbury.

Royal Northern Hospital, London:

JEWESBURY, E. C. O., M.A., D.M. Oxfd, M.R.C.P., D.P.M.: phys neurological department.

NEUSTATTER, W. L., M.D., B.SC. Lond., M.R.C.P.: phys psychiatric department.

SHARP, B. B., M.D. Lond., M.R.C.P., D.P.M.: physician, psych department.

* Amended notice.

Births, Marriages, and Deaths

BIRTHS

GREWAR.—On Aug. 14, at Dundee, to Dr. Joyce Grewar, wi Dr. David Grewar—a daughter.

ESSEX-CATER.—On Aug. 11, in London, the wife of Dr. An Essex-Cater—a son.

KEMP.—On Aug. 19, in London, the wife of Dr. T. A. Ke a daughter.

MARRIAGES

BOYLE—SMITH.—On Aug. 19, at Middlesbrough, Philip Te Boyle, M.B., to Dorothy Smith.

GILLIS—GREAVES.—On Aug. 12, in London, Leon Gillis, M. F.R.C.S., to Rachel Greaves.

DEATHS

HIGGS.—On Aug. 12, at St. Leonards-on-Sea, Walter Alf Higgs, M.R.C.S.

JAMIESON.—*On Aug. 20, in Dublin, John Kay Jamieson,* M.B. I

LOWE.—On Aug. 18, Percy Roycroft Lowe, O.B.E., B.A., M.B. Ca aged 78.

PARMITER.—On Aug. 19, at Wimborne, Bernard Rayne Parm M.B. Lond.

PERCEVAL.—On Aug. 19, at Bournemouth, John Lancel Perceval, M.R.C.S., aged 61.

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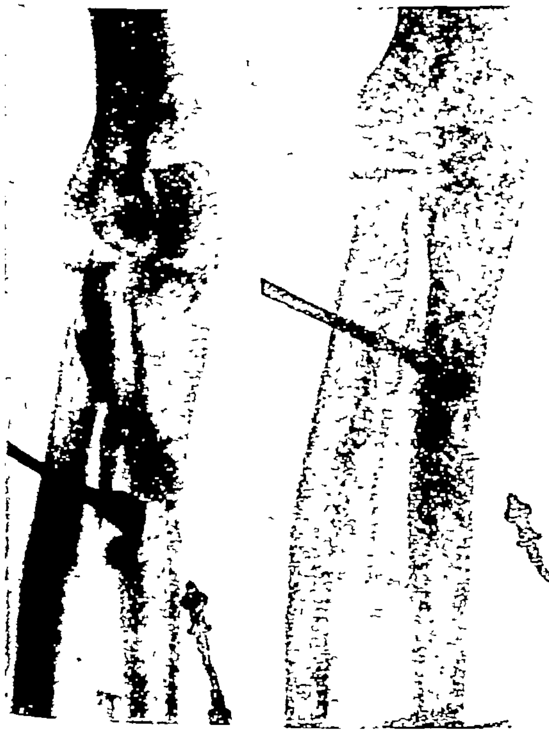
[1] Hathaway, W. Education and Health of the Partially Seeing Child. London: Oxford University Press. 1948. Pp. 216. 14s.

as reduced to diastolic pressure. The coloured fluid not rise more than 3–4 cm.; but, if the flow was cut he coloured fluid could be made to ascend 12 cm.

is observation confirmed my impression that, to t the thiopentone high into the arm, there had been ial or complete obliteration of the pulse during the tion—due to arm or neck posture, or to the fact that "venous" tourniquet, rubber, or assistant's comsion had been inadequately released. A very transient rial spasm which may give the solution an opporty to ascend and be held can also follow too usiastic compression of the arm by the assistant. t this may have happened is shown by the report ne of the cases, that blistering subsequently developed he site where the nurse had maintained pressure on arm.

MPRESSION OF SUBCLAVIAN AND AXILLARY ARTERIES

is important for the anæsthetist to be aware of the hanical factors which may temporarily obliterate reduce the brachial and distal pulses. In a high entage of normal persons bracing of the shoulders lead to compression of the subclavian artery by the ricle against the first rib and loss of distal pulse; andbag between the shoulders may do it. Strong nward traction of the elbow, such as firm tucking in the hands under the buttocks, may obliterate the se, and gangrene of the hand is known to have owed this. A forceful deep inspiration will in some sons lead to the transient disappearance of the pulse; mechanism is not clearly understood, but arrest of the se may be due to ascent of the first rib compressing rib against the clavicle, or to the scissors-like gripping the subclavian artery by the scaleni muscles. Placing e arm above the forehead may obliterate the pulse; right (1945) found that in over 80% of 150 young adults e pulse was obliterated when the arm was elevated full abduction; the axillary artery is believed to be compressed or angulated over the root of the coracoid process or over the tendinous insertion of the pectoralis minor muscle. Cervical ribs have always to be borne in mind; the pulse is readily obliterated in such cases by posture. The anæsthetist must also remember that in some persons rotation of the head, or hyperextension of the neck, will lead to compression of the subclavian artery and loss of the distal pulse. In one of the thiopentone tragedies the injection of 4 ml. of a 10% solution was followed by extensive arterial thrombosis up to the axilla—the patient was in the Trendelenburg position at the time of the injection, and the anæsthetist rightly presumed at first that the posture rather than the injection was responsible for the absence of the radial pulse and for the effects in the hand. If thiopentone is injected into a nonpulsating artery, it will not only ascend to a high level but also will maintain its action undiluted. Hasler (1948) discusses some of the complications following such faulty posture in anæsthesia.



ig. 2—Arteriograms: (a) full-force retrograde injection, showing height to which fluid ascended and enormous distension of arterial lument; (b) slow injection, showing filling of arterial tree.

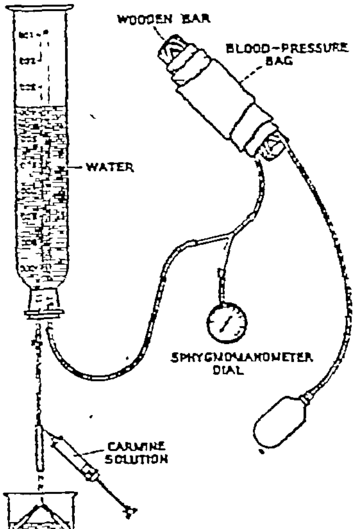


Fig. 3—Apparatus to mimic fluid flowing at arterial pressure and giving a flow of 30 ml. per min. in forearm: needle is introduced through rubber junction, carmine is injected with full force upwards through glass tube, and height of ascent of fluid is measured.

Pulse

The pulse has not always been closely observed in the affected limb; it may certainly remain full, and in two of the cases blood-pressure readings on palpation were the same in both radial arteries. The radial pulse has been found full for an hour and then disappeared; in one case the pulse was absent for an hour and returned only to disappear later. In three cases the full pulse gave a feeling of optimism, but pulsatian ceased some days later with alarming suddenness; in one, a child, it disappeared on the eighth day; in the second case the radial pulse disappeared on the tenth day, and section showed the vessel lumen lined with fibrin adherent to the intima but still patent; in the third case the radial pulse suddenly disappeared on the sixteenth day, and operation showed the brachial tree plugged with clot. The conclusion to be drawn is that the presence of a pulse does not exclude the possibility of severe damage to the intima and later precipitate thrombosis.

CLINICAL FEATURES

Pain

Intra-arterial thiopentone injection causes severe pain, coming on when about 2 ml. has been injected. The pain is agonising, and patients have described it as "like boiling water being poured over my hand," "a feeling as if my hand was on fire," "the hand felt like a flaming branch." On several occasions the complaint of pain during injection was regarded as due to the "patient's nervousness"; in one case the possibility of thiopentone being responsible for the postoperative pain was so completely overlooked that a neurologist's opinion was invited. He observed the thrombosed radial artery and indicated the cause. "Nervousness" on the part of the patient cannot be entirely dismissed as a contributory cause to the development of the more severe sequelæ.

deep venous thrombosis followed the injection of thiopentone, and attributed this as in part due to the placing of the elbow in acute flexion (the hand being tucked behind the head) after the injection. I have seen an injection of thiopentone followed by an enormous œdematous forearm which took over nine months to subside. Such cases are rarely reported.

Anæsthetists need to be aware of the dangers of venous thrombosis; for, should intra-arterial injection be suspected, it would be unwise to risk thrombosing the veins in that arm, and any further thiopentone should be injected into the opposite arm. The present practice, too, of violently flexing the elbow after intravenous puncture can have no physiological sanction; local pressure and elevation of the limb are obviously what is needed. Moreover, such acute flexion of the elbow will obliterate the forearm pulses in most normal persons and may be responsible for the trapping and long-sustained action of any intra-arterial thiopentone.

INCIDENCE OF INTRA-ARTERIAL INJECTION OF THIOPENTONE

Intra-arterial injection, fortunately, has been a rare accident; within the last five years, after making full inquiries from leading anæsthetists and surgeons in this country, I have been able to gather only eight unreported cases. Lundy (1942) reports 3 intra-arterial punctures in 25,000 cases. In the B.L.A. campaign there was only one case (Porritt et al. 1945), and I am indebted to Brigadier A. E. Porritt, C.B.E., for the following report from Lieut.-Colonel J. H. Rink (anæsthetics adviser, 21 Army Group):

> "I only came across one case of intra-arterial injection of pentothal during the existence of 21 Army Group. The injection was undoubtedly made in the artery, and 3 ml. was given before it was realised; the anæsthesia was then continued with gas and oxygen. The patient complained of the typical intense pain along the course of the radial artery and in his hand, but he subsequently suffered no ill effects. I saw him next day, when he was normal in all respects, though no palliative injection of procaine was made, as some times recommended."

In the B.L.A. campaign, out of 181,000 casualties 55,000 required some form of front-line surgery; it may reasonably be presumed that most of these had thiopentone. One in 55,000 is probably a fair figure of the incidence of such major thiopentone tragedies in this country.

Particularly tragic is the fact that the thiopentone accidents have happened in the course of some relatively minor operation—e.g., for tonsils, ischiorectal abscess, hammer toe, uterine dilatation and curettage, knee cartilage, and, in one particularly pathetic case, colostomy; the helpless pitiful state of the latter patient with one arm can well be imagined. The 10% solution has been responsible usually for the serious effects, but in several of the tragedies the 5% solution was used. Several anæsthetists declare that they believe that they have accidentally injected the 5% solution into an artery without untoward effects; a well-marked limb flush has been the only subsequent complication. I have been unable to trace any case that has followed the use of hexobarbitone ('Evipan').

HEIGHT OF ASCENT OF RETROGRADE ARTERIAL INJECTION

A 35% solution of diodone was injected in retrograde fashion into the flowing arterial stream during an operation on the ulnar artery for arteriovenous aneurysm. The fluid was injected with full force through a two-way tap by an assistant after I had punctured the artery. Fig. 2 shows to what an enormous extent the artery was forcibly distended, and that the injected solution ascended into the brachial tree and was then redistributed. The exposure lasted $2^1/_2$ sec., the distal tree did not fill, and the solution was held. This explains why a retrograde arterial injection of thiopentone may have a some-

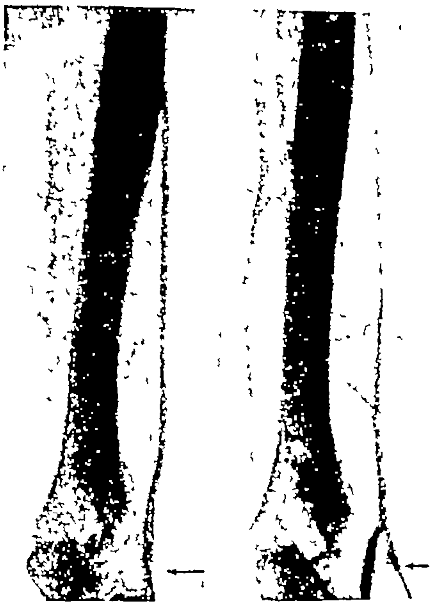
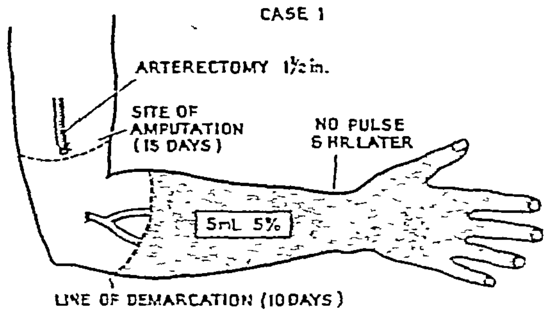


Fig. 1—Phlebograms: injection at elbow; arrows indicate points; note retrograde flow into forearm and spill or connecting veins.

what long-continued action. Despite this violent stre of the artery spasm of the major vessel was not tained; when, with the needle kept in place, the inj was repeated in the time that it takes to change a the major vessel was now of normal size and the arterial tree was already filling. This injection lasted $2^1/_2$ sec. but was slow and gentle. Slow inj may explain why some of the intra-arterial thiope injections were not followed by serious lesions; ready distal escape of the solution spared the vessel and allowed the thiopentone to become di

Arteriography also demonstrated that despite force injection the solution ascended against the fl arterial stream not much more than 6–7 cm.; gentler injection 3–4 cm. only (fig. 2). In the thiope cases operation has shown that the vessel may be with thrombus extending as high as 5 in. (12 5 above the elbow, and in one case up to the axilla. common experience that, with any trauma, a thrombosis does not ascend higher than the n proximal major collateral branch. This suggeste the high ascent of the thiopentone could only have possible if the arterial circulation had been either pletely or partially occluded during the injection. were two possible causes for this: (1) inadequate r of the "venous" tourniquet; and (2) mech obliteration by the patient of the subclavian or ax arteries by the clavicle or other local mechanism, to the position of the limb on the operating-table.

To investigate this, apparatus was designed to r fluid flowing at arterial pressure (fig. 3) conforming the blood-flow in the brachial artery under n conditions. Fluid was arranged to flow at 30–4 per min., with air-pressure above the fluid at n blood-pressure level. This flow was decided on in of the plethysmograph studies of Barcroft and Ed (1946) and Goetz (1946), who have shown that the b flow in the forearm under resting conditions is 3– per min. per 100 c.cm. of forearm tissue. Since average forearm volume is about 1000 c.cm., this m a flow of 30–40 ml. per min. through the brachial a This figure might well be doubled when the distal are warmed (J. McMichael, personal communicat A coloured solution was then injected with a 10 syringe into the flowing stream. A similar injection also tried when the air-pressure head above the



4—Stippled areas in all figures indicate gangrene, unless otherwise indicated.

ompression by incision must be considered. The ticular indication is a centripetal spread of the anæs- sia. Such fascial decompression was done in one of e cases with good result.

A further observation was that the fingers developing ngrene did not develop œdema; the fingers that covered did. The absence of œdema indicates that the rculation in these fingers must have been completely rested, that the major digital vessels were thrombosed. he fingers that recovered can have had spasm of the gital vessels only.

The march of events in the fingers after intra-arterial jection of thiopentone so closely mimics that of the "high-altitude frostbite" cases that were seen during he war that we turn to the beautiful studies by Davis t al. (1943) for comparative information about the athology. They showed by capillary microscopy that here was either thrombosis or intense spasm in the distal rteriolar-capillary loops; such spasm might be main- ained for twenty-four hours at least. When thrombosis ad taken place in these digital vessels, no therapy was ny good; and that applies to the thiopentone cases. An nteresting observation, too, was that some of the "high-altitude frostbite" cases subsequently developed "Raynaud's phenomenon" sensitivity to cold. One f the thiopentone cases that I examined several years fter the injection had a similar complaint; a fact which may be of some medicolegal importance.

Loss of Consciousness

After intra-arterial injection of thiopentone, loss of onsciousness was usually delayed, but apparently not more than 45–50 sec.; recovery of consciousness was rapid in several cases. With 3 ml. (5 or 10%) injected within 8 sec. unconsciousness usually followed within 20 sec. (Hunter 1947). Since total gangrene followed the intra-arterial injection of 4 ml. of 10% *thiopentone* and the patient lost consciousness, most of the solution must have passed through the arterial tree and could have been but momentarily trapped. The irritant action of thiopentone must therefore be immediate and powerful. This fact indicates that the intra-arterial injection of local antidotes—even if available—would be too late.

CASE-RECORDS

Case 1.—A soldier underwent excision of knee cartilage under low spinal anæsthesia, coöperating well. When tourniquet was applied he became restless and complained bitterly of pain. Skin was anæsthetic to forceps clipping, and operation continued. Patient, however, became agitated and apprehensive, tossing his head from side to side.

Injection of 5% thiopentone into right basilic vein at level of antecubital fossa was begun. Immediate complaint of pain at injection site. Since repeated aspiration did not show arterial blood, pain was attributed to patient's extreme apprehension. After 5 ml. he suddenly jerked his arm, and a large hæmatoma formed. Needle was removed, and cyclopropane anæsthesia continued.

Three hours later patient complained of considerable pain in antecubital [illegible] tingling sensation in right hand. Pain in antecubital fossa was attributed to interstitial spilling. Local heat was applied.

Six and a quarter hours after injection, fingers and wrist had become acutely flexed, and hand white and cold. Radial pulse absent, brachial artery pulsating just above elbow-joint but not below it. Entire hand and forearm completely anæsthetic.

On exploration brachial artery was found normal to 2 in. above bifurcation, then passed through a sausage-like tumour of extravasated blood. This was not tense, and further exposure of vessel showed also extravasation of blood into adventitia. Lumen was filled with thrombus to bifurcation and beyond.

Arterectomy.—1½ in. of brachial artery resected, and thrombus from radial and ulnar arteries extracted.

Postoperative Course.—Left hand and right leg immersed in water-bath at 112°F in attempt to force collateral circulation. Next day, some skin warmth on upper third of forearm, with sensation present to this point. "Spasm" of flexor muscles no longer present. Line of demarcation began to form, complete by eighth day; line extended from 4 in. below elbow on lateral side upwards to elbow-joint medially. Impossible to save joint. Amputation through arm on fifteenth day after injection (see fig. 4).

Extensive arterial thrombosis swiftly sealed the fate of the limb. The brachial artery can usually be ligated with impunity, if the collateral vessels are undamaged. It therefore appears that both the collateral branches and the main distal channels continued to be blocked by soft thrombus. Arterectomy certainly did not relieve so-called "collateral vessel reflex spasm"; the warmth of the skin of the upper forearm indicates that this could, in any event, never have been complete. The large periarterial hæmatoma is to be expected after arterial puncture, but is an unusual finding compared with other cases. A 5% solution is reported to have been used, which makes such a disastrous end-result unusual.

Case 2.—A soldier, aged 45, was operated on for depressed fracture of malar bone. A 10% solution of a "new thiobarbiturate closely related both clinically and pharmacologically to pentothal" was injected, exact amount not recorded. Immediate complaint of severe pain in hand and arm (notes report "solution was injected into an aberrant superficial ulnar artery").

A few seconds after injection, ulnar half of hand and ulnar border of forearm became fiery red. Reaction subsided rapidly: replaced by mottled pallor. Immediate brachial-plexus block done ("satisfactory vasodilatation obtained"). Operation continued under cyclopropane anæsthesia.

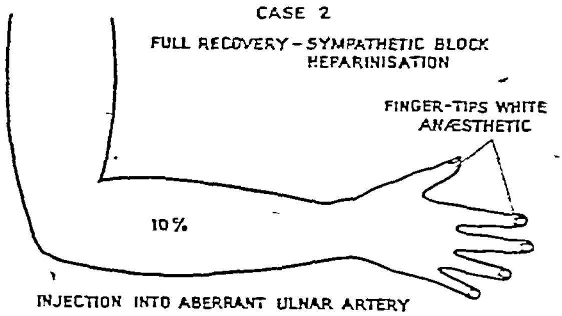

CASE 2
FULL RECOVERY - SYMPATHETIC BLOCK HEPARINISATION
FINGER-TIPS WHITE ANÆSTHETIC
10%
INJECTION INTO ABERRANT ULNAR ARTERY

Fig. 5.

At end of operation intravenous saline drip, containing heparin, started; both arms placed in hot-water baths, and patient packed with hot-water bottles. Some three hours after operation, hand again blanched, and tips of the third, fourth, and fifth fingers presented white patches; fingers felt numb to patient. On exposure, ulnar side of hand became distinctly colder than rest of hand and arm. Pulsation present in main arteries.

Sympathetic block of right stellate ganglion now done with 20 ml. of 2½% procaine hydrochloride in 1/1000 amethocaine; posterior approach used, and Horner's syndrome obtained. Much vasodilatation of right upper extremity followed, blanching of ulnar side of hand disappeared, and hand became warm.

Intense transient vasoconstriction, particularly of the distal arterioles, may follow and lead possibly to the trapping or the delay of some of the solution in the distal arterial tree. Wilkins et al. (1938) have shown that various stimuli, such as pinprick, taking a deep breath, or solving a mental problem, will temporarily decrease the blood-flow to the digits to as much as a twentieth of the previous level, independent of any alterations in systemic pressure. This does not happen with the sympathectomised limb and has some bearing on "post-accident" treatment.

Two of the patients (see below) developed shock after the intra-arterial injection, with poor pulse on the opposite limb also, and carpopedal spasm. This may be due to the pain, but severe vasomotor reactions have been described in arteriography with organic iodine compounds. Even intravenous solutions are not without risk, for intravenous pyelography, usually regarded as absolutely safe, has a mortality: Prendergrass et al. (1942) collected 26 deaths in 661,800 such examinations—an incidence of 0·0039%.

Idiosyncrasy or hypersensitivity to thiopentone has been described by Hunter (1943) and Hoenigsberger (1943) has recorded sudden collapse. I witnessed the sudden death, after an injection of thiopentone 0·5 g., of a perfectly healthy young soldier undergoing a minor finger operation. Necropsy did not reveal any cause, but in view of the vasomotor reactions with the intra-arterial injection it obviously becomes important to examine the forearm vessels in any such tragedies. Lundy (1942) declares "a certain number of fatalities are attributable to intra-arterial puncture"—though the immediate collapse makes it difficult to agree with the contention that death was due to "delayed return into the stream."

Area Affected

Six of the twelve cases ended with arm or forearm amputation; two with loss of fingers; two suffered severe nerve effects, with associated Volkmann's contracture of the interossei muscles of the thenar space in one case. The white hand—palm and dorsum—and the cyanosed fingers were early confirmatory signs of the accident. Such rapid cyanosis of the fingers, as Lewis (1936) has shown, does not indicate venous spasm or arrest, but implies a sluggish arterial circulation in a warm hand, leading to rapid reduction of oxyhæmoglobin. Some of the fingers soon became dark purple; these fingers ultimately suffered most. Others remained ashen grey.

Massive gangrene of the limb followed extensive thrombosis in the major vessels. Where these escaped, the ultimate damage depended on the direction of flow of the thiopentone; if this was swept into the muscles, the fingers were often spared. On anatomical grounds (see below)—and this is confirmed by clinical experience—inadvertent injection into the easily mistaken superficial ulnar artery is less likely to lead to the solution reaching and affecting the brachial artery bifurcation; the prognosis is thus better, for the entire limb blood-supply is not jeopardised.

Skin Patches

Several of the cases showed, besides the hand and finger involvement, mottled bluish-green patches in the skin of the forearm, round the elbow-joint, and in the arm well above the site of injection. Some of these patches merely blistered, being filled with clear or serosanguineous fluid; in other patches the skin died and sequestered, leaving punched sloughing ulcers.

Similar patches and ecchymotic areas have been observed in disasters consequent on arteriography. Lambret (1935) and Leclerc (1935) observed violet plaques, regarded as due to cutaneous and subcutaneous hæmorrhages, on the skin of the lower abdominal wall, following femoral arteriography; Leveuf (1935) and Wagner (1944) described this following use of iodoxyl for brachial arteriography. The workers interpreted these patches as due to seco spread of thrombosis from the main vessel to the cutaneous branches.

Thrombosis of the brachial artery can be exclud the thiopentone cases, for in some with patches subse operation showed no such clot. These patches a to be due to the direct local effect of the thiope solution shunted into the skin vessels. The wo Freudenthal (1924) favours this, for he showed th the patches of skin gangrene observed after the acci injection of bismuth into a gluteal artery, the bl of the cutaneous vessels by bismuth-salt crystals be demonstrated by microscopy.

Limb Œdema, Muscle Death, Nerve Effects

A striking feature has been the extensive œde hand and forearm in some of the cases; this m evident within two hours and well-marked withi hours, by which time it may have extended abo site of injection. When the forearm was explored muscles bulged on incision of the fascia but w normal colour, and the œdema appeared not to interfered with their blood-supply. Œdema of m appeared to be responsible for the flexion of the in some of the cases, for it was noted that these still be straightened passively. In one case such straightening became impossible at the end of six the fingers being rigidly flexed and contracted— state of rigor mortis, like the Volkmann's isch contracture of muscle. This is an important ob tion (Johnson 1946), for it confirms Lewis's opin muscle cannot withstand complete ischæmia more than six hours. Dissection of three of the after amputation showed the extensor muscles, as as the flexor group, to be necrotic. This also i important finding, for the extensor muscles have a blood-supply through the profunda vessels, and one w expect these to survive, as they often do in the Volk contracture following trauma. It is likely, thoug have no histological evidence for this, that the thiope solution spread into and thrombosed the dorsal osseous artery on its extensor path as well, and blocked the linking distributing flow of the pro vessels. It emphasises the need for a closer study o such amputated arms.

Study of the extent of thrombosis of forearm v is also important, for it helps to explain the nerve e in these cases. Adams (1942) has shown that major nerves, as they traverse the forearm, re branches of supply from the main arteries; interfe with the blood-supply will interfere with nerve co tion (Holmes et al. 1944, Bentley and Schlapp 1 The interosseous branch of the ulnar artery is partic important in its blood-supply to the median n These facts help to explain the anæsthesia and atr of the intrinsic muscles of the hand that devel in cases 4 and 8. Ischæmia of the nerve-trunks sequent on the arterial thrombosis, rather than the action of thiopentone on the blood-supply of the mu seems here to have been responsible for the nerve le in the hand.

It is of some importance that œdema was never conspicuous in these two cases, for Parkes (1945) brought evidence to show that compression by œd may be sufficient to arrest the blood-supply to nerves and yet not affect pulse and nutrition in distal part of the limb. His conclusions are base the observations of Lewis et al. (1931), who have sh that nerves may be more readily rendered isch because the blood-supply of their feeding branches ca obliterated by pressures as low as 60–70 mm. Hg. work of Parkes indicates that, if the œdema after in arterial injection of thiopentone becomes severe, fa

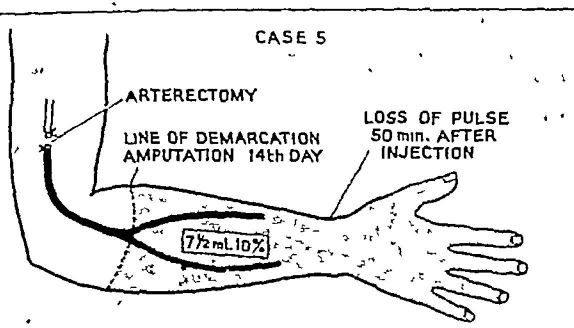


Fig. 8.

discoloration of tip of index finger. Intrinsic muscles of d appeared to be grossly affected, thenar muscles being k, and interossei and adductors of thumb "apparently npletely gone."

urther history of this case has been impossible to trace, the anæsthetist informs me "he has heard that patient de complete recovery" (see fig. 7).

The loss of forearm pulses after the operation suggests it the patient had an arterectomy. After a brachial erectomy the radial pulse usually returns within a r days (4 days as a rule). The non-return of the lses indicates a continued blocking of the radial ery by soft thrombus; this is suggested too by the port of a good ulnar pulse before operation. The reasing anæsthesia of the hand suggests some post-erative extension of the thrombosis. The paresis the intrinsic muscles of the hand and their later covery indicate some blocking of the vascular supply the main nerve-trunks. It might be suggested that the edian nerve at the elbow received the thiopentone solu-on; but the entire hand was involved and the fore-m muscles were not affected. We can only assume iat the injection was intra-arterial, the complete bsence of pain being unusual. The early muscle spasm iggests that much of the solution may have taken its ath via the forearm muscles, and that may explain the rtunate happy result with such a large intra-arterial jection.

Case 5.—This case has been reported in detail by Johnson 946). Male, aged 37, with buttock abscess. Needle entered ito "median cephalic vein." Venous-looking blood aspirated, od injection of a 10% solution of pentothal begun. After 5 ml. "patient began to move about, this was taken to mean iat he was tasting sulphur"; injection continued.

After about 7·5 ml. had been given, patient groaned and ioved, but there was no indication of pain in the hand. njection now stopped; patient lost consciousness; abscess ncised. Anæsthetist noted area of petechial hæmorrhages ibout 3 in. broad above elbow, where nurse had compressed um.

Recovery of consciousness apparently rapid—60–90 sec. Patient groaned and complained of pain in both arms, especially the left. Left hand was pale and bluish; both hands and feet went into typical carpopedal spasm. Both radial pulses present, equal, and of good volume. In the ward, 50 min. after operation, pulse had disappeared; fore-arm white and flaccid below elbow. (All spasm had dis-appeared from extremities.) Meanwhile, arm had been placed under electric cradle, and papaverine, carbachol, and alcohol administered.

No arterial pulsation below a point 3 in. above the elbow could be detected. Complete loss of voluntary movement in wrist and fingers, but passive movements full and painless, and such passive movement did not increase pain.

Six hours after injection, thumb had become flexed across palm, and fingers were beginning to contract. Static blood could be observed in capillaries; no evidence of capillary irculation. It was decided to explore the vessel, and this was done under general anæsthesia.

At a point 3 in. above site of injection brachial artery pulsa-ion ended abruptly. Narrow band of demarcation well above site of injection. Below site of constriction vessel was slightly dilated and blue, obviously thrombosed.

Aspiration showed no fluid blood present. About 5 in. of artery was removed; it was filled with clot. No definite puncture site could be seen, nor was there staining or bleb in adventitia; no periarterial extravasation of blood. Patient was given heparin 10,000 units intravenously into other arm. Unsuccessful attempt to block cervical sympathetic by posterior approach.

Two days later some sensation had returned to upper third of forearm; skin here pink, but blue and sensationless below, indicating appearance of an early line of demarcation. Below this, arm showed all signs typical of dry gangrene.

Two weeks after original injection there was a well-formed line of demarcation extending $4^1/_2$ in. down radial side, and 3 in. on ulnar side, below elbow. Amputation eventually performed just above this level (see fig. 8).

Extensive arterial thrombosis was clearly the cause of limb death. The early maintenance of the pulse indicates that arterial spasm was not responsible for the thrombosis. Blistering at the site where the nurse had compressed the arm suggests that this may have been too vigorous, cut off the pulse, and permitted the higher injection of the solution. The onset of Volkmann's contracture six hours after the injection is valuable information; the previous painless passive movements possible indicate that the muscles before this time were still alive. Arterectomy made no difference to the ultimate result. In view of the carpopedal muscular spasms shortly after the injection, it is of interest to note that Macintosh and Heyworth (1943) reported that after an injection of 0·75 ml. of thiopentone into a cat's iliac arteries similar muscular contraction in all four limbs, of short duration, followed.

Case 6.—Female, 43, abdominoperineal operation. Given 10 ml. of thiopentone. "At the end of the operation the right arm was observed to be cold and pallid, as if arterial blood had been cut off." Thought possibly due to faulty position of arm on table. Both radial and ulnar pulses absent, and pulsation could be felt in brachial artery only high up—2 in. below axilla. "2% procaine was injected, in case this might be arterial spasm"; circulation did not improve.

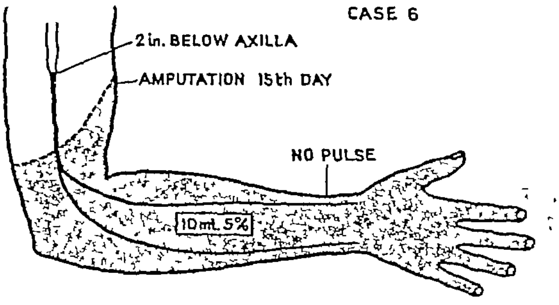


Fig. 9.

Four hours after operation, cubital fossa was explored under local anæsthesia, and vessel was exposed from axilla to elbow. Brachial artery was anomalous, bifurcating about 1 in. above fossa; radial and ulnar arteries superficial, ulnar artery then disappeared beneath lacertus fibrosus to enter forearm.

Site of injection was clearly found in brachial artery, which was opened and found completely filled with clot; thrombosis extended from $1^1/_2$ in. below axilla far into fore-arm along the two branches. These are the only operation notes.

Dry gangrene set in, fingers clawed, forearm became partially mummified, and a line of demarcation appeared extending from lateral side just above elbow round arm to 2 in. below axilla. Skin of upper arm looked healthy, presumably owing to circulation in profunda branch of brachial artery.

There being no urgent toxic symptoms, amputation was delayed until 15 days after original injection (see fig. 9).

A 5% solution of thiopentone was used; the resultant thrombosis was most extensive, blocking both the superior and inferior ulnar collateral vessels and leading to the formation of the line of demarcation above the

Heparinisation continued; clotting-time, two hours after stellate block, 27 min. Patient now began to cough up considerable quantities of bright-red blood, which did not clot; apex of lung must have been injured during sympathetic block. Heparin stopped. Radiography showed nothing abnormal in chest.

Next morning, hæmoptysis had stopped, and clotting-time was normal. No further disturbances in hand.

Some fifteen days after original accident patient complained of dyspnœa on lying flat. Radiography showed large retro-pleural mass in relation to apex of right lung, extending posteriorly down to tenth intercostal space.

Aspiration produced 150 ml. of dark unclotted blood. Dyspnœa disappeared immediately, and hæmatoma was gradually absorbed (confirmed by radiography). (See fig. 5.)

The full vasodilatation that followed sympathetic block is an obvious pointer that this will be a useful measure in the management of such cases. Since the main vessels were pulsating fully thrombosis can be excluded, and the beneficial effects of the sympathetic block must be due to its effect in releasing spasm in the distal arterioles. Two further facts of significance are: (1) brachial-plexus block was as effective as the more difficult posterior sympathetic block; and (2) the arteriolar spasm recurred within four hours. Sympathetic block in a heparinised patient is well shown to be hazardous.

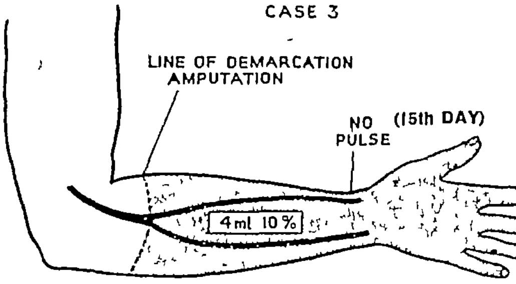
Case 3.—An adult, with gastric ulcer, admitted for partial gastrectomy was given heavy spinal 'Nupercaine,' followed by 4 ml. of 10% thiopentone and then nitrous oxide and oxygen. Injection reported as painful, hand became white, and on skin of forearm irregular blue patches developed. Radial pulse full and continued thus for whole day. Entire hand anæsthetic, as also distal half of ulnar aspect of forearm. Motor power poor: feeble finger flexion and extension possible; wrist could be held against gravity; but pronation and supination impossible. Flexion and extension of elbow good.

Next day circulation improving, pulse reported as "good," but forearm muscles firm and indurated. Circulation in fingers gradually improved.

On fifteenth day after injection, sudden loss of radial pulse; hand became cold and white, and finger and wrist movements impossible. Four days later mummification began. Oblique irregular line of demarcation developed in upper third of forearm.

Forearm amputation, thirty days after injection, made possible by dissecting out muscles, which were all avascular except for biceps and triceps; 2-in. bone stump was left. Ulnar and radial arteries and last 3 in. of brachial artery thrombosed. Normal pulsating segment not observed. Accompanying venæ comites not thrombosed. A useful small elbow stump saved (see fig. 6).

Particular features are: (1) only 4 ml. of a 10% solution was used; and (2) the radial pulse suddenly vanished on the fifteenth day. The loss of finger movement and the induration of the forearm muscles suggest that these were already dead before the final loss of the radial pulse. The onset of the late thrombosis is discussed below. A line of demarcation was waited for, and it is to be noted that there were no renal or other systemic effects from absorption of dead muscle tissue, as has been reported to follow arterial thrombosis with muscle death in the legs (Guthkelch 1943, Bywaters and Stead 1945). The saving of even a small elbow stu by dissecting out the dead muscles, was an excel manœuvre; for, contrary to the teaching of s surgical textbooks this small stump may prove of utmost importance as regards the subsequent typ prosthesis (Gillis 1945).



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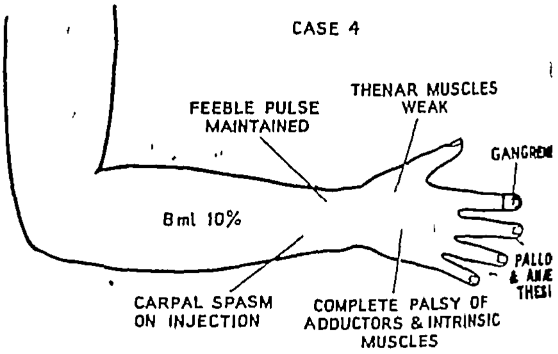

Fig. 7.

After about 10 min. muscular spasm relaxed a little, still no improvement in colour of hand. Radial pulse returned, but not so good as its fellow. At end of operat radial pulse just palpable, colour of hand fair, but n somewhat cyanosed.

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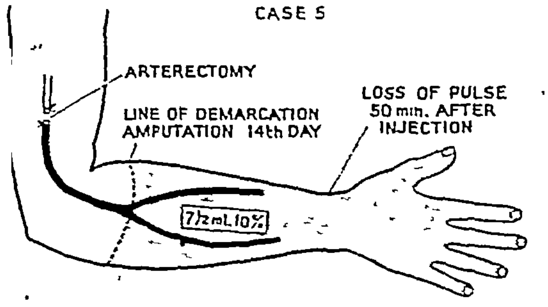

Fig. 8.

scoloration of tip of index finger. Intrinsic muscles of appeared to be grossly affected, thenar muscles being and interossei and adductors of thumb "apparently letely gone."

ther history of this case has been impossible to trace, he anæsthetist informs me "he has heard that patient complete recovery" (see fig. 7).

e loss of forearm pulses after the operation suggests the patient had an arterectomy. After a brachial ectomy the radial pulse usually returns within a days (4 days as a rule). The non-return of the s indicates a continued blocking of the radial y by soft thrombus; this is suggested too by the rt of a good ulnar pulse before operation. The asing anæsthesia of the hand suggests some post-ative extension of the thrombosis. The paresis he intrinsic muscles of the hand and their later very indicate some blocking of the vascular supply ie main nerve-trunks. It might be suggested that the ian nerve at the elbow received the thiopentone solu-; but the entire hand was involved and the fore-muscles were not affected. We can only assume the injection was intra-arterial, the complete ence of pain being unusual. The early muscle spasm gests that much of the solution may have taken its h via the forearm muscles, and that may explain the umate happy result with such a large intra-arterial ction.

ase 5.—This case has been reported in detail by Johnson 16). Male, aged 37, with buttock abscess. Needle entered "median cephalic vein." Venous-looking blood aspirated, injection of a 10% solution of pentothal begun. After ml. "patient began to move about, this was taken to mean he was tasting sulphur"; injection continued.

fter about 7·5 ml. had been given, patient groaned and ved, but there was no indication of pain in the hand. ection now stopped; patient lost consciousness; abscess ned. Anæsthetist noted area of petechial hæmorrhages ut 3 in. broad above elbow, where nurse had compressed a.

Recovery of consciousness apparently rapid—60–90 sec. tient groaned and complained of pain in both arms, pecially the left. Left hand was pale and bluish; both nds and feet went into typical carpopedal spasm. Both lial pulses present, equal, and of good volume. In the rd, 50 min. after operation, pulse had disappeared; fore-n white and flaccid below elbow. (All spasm had dis-peared from extremities.) Meanwhile, arm had been placed ler electric cradle, and papaverine, carbachol, and alcohol ninistered.

No arterial pulsation below a point 3 in. above the elbow ld be detected. Complete loss of voluntary movement wrist and fingers, but passive movements full and painless, such passive movement did not increase pain.

ix hours after injection, thumb had become flexed across m, and fingers were beginning to contract. Static blood ld be observed in capillaries; no evidence of capillary ulation. It was decided to explore the vessel, and this done under general anæsthesia.

At a point 3 in. above site of injection brachial artery pulsa-n ended abruptly. Narrow band of demarcation well ve site of injection. Below site of constriction vessel was htly dilated and blue, obviously thrombosed.

Aspiration showed no fluid blood present. About 5 in. of artery was removed; it was filled with clot. No definite puncture site could be seen, nor was there staining or bleb in adventitia; no periarterial extravasation of blood. Patient was given heparin 10,000 units intravenously into other arm. Unsuccessful attempt to block cervical sympathetic by posterior approach.

Two days later some sensation had returned to upper third of forearm; skin here pink, but blue and sensationless below, indicating appearance of an early line of demarcation. Below this, arm showed all signs typical of dry gangrene.

Two weeks after original injection there was a well-formed line of demarcation extending 4½ in. down radial side, and 3 in. on ulnar side, below elbow. Amputation eventually performed just above this level (see fig. 8).

Extensive arterial thrombosis was clearly the cause of limb death. The early maintenance of the pulse indicates that arterial spasm was not responsible for the thrombosis. Blistering at the site where the nurse had compressed the arm suggests that this may have been too vigorous, cut off the pulse, and permitted the higher injection of the solution. The onset of Volkmann's contracture six hours after the injection is valuable information; the previous painless passive movements possible indicate that the muscles before this time were still alive. Arterectomy made no difference to the ultimate result. In view of the carpopedal muscular spasms shortly after the injection, it is of interest to note that Macintosh and Heyworth (1943) reported that after an injection of 0·75 ml. of thiopentone into a cat's iliac arteries similar muscular contraction in all four limbs, of short duration, followed.

Case 6.—Female, 43, abdominoperineal operation. Given 10 ml. of thiopentone. "At the end of the operation the right arm was observed to be cold and pallid, as if arterial blood had been cut off." Thought possibly due to faulty position of arm on table. Both radial and ulnar pulses absent, and pulsation could be felt in brachial artery only high up—2 in. below axilla. "2% procaine was injected, in case this might be arterial spasm"; circulation did not improve.

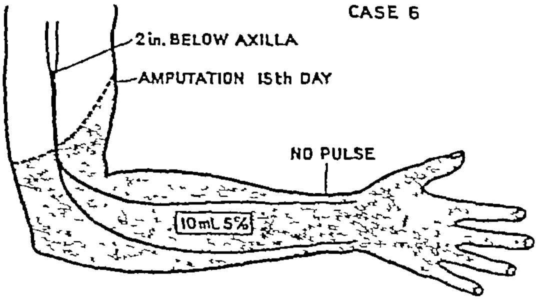

Fig. 9.

Four hours after operation, cubital fossa was explored under local anæsthesia, and vessel was exposed from axilla to elbow. Brachial artery was anomalous, bifurcating about 1 in. above fossa; radial and ulnar arteries superficial, ulnar artery then disappeared beneath lacertus fibrosus to enter forearm.

Site of injection was clearly found in brachial artery, which was opened and found completely filled with clot; thrombosis extended from 1½ in. below axilla far into fore-arm along the two branches. Those are the only operation notes.

Dry gangrene set in, fingers clawed, forearm became partially mummified, and a line of demarcation appeared extending from lateral side just above elbow round arm to 2 in. below axilla. Skin of upper arm looked healthy, presumably owing to circulation in profunda branch of brachial artery.

There being no urgent toxic symptoms, amputation was delayed until 15 days after original injection (see fig. 9).

A 5% solution of thiopentone was used; the resultant thrombosis was most extensive, blocking both the superior and inferior ulnar collateral vessels and leading to the formation of the line of demarcation above the

Heparinisation continued; clotting-time, two hours after stellate block, 27 min. Patient now began to cough up considerable quantities of bright-red blood, which did not clot; apex of lung must have been injured during sympathetic block. Heparin stopped. Radiography showed nothing abnormal in chest.

Next morning, hæmoptysis had stopped, and clotting-time was normal. No further disturbances in hand.

Some fifteen days after original accident patient complained of dyspnœa on lying flat. Radiography showed large retropleural mass in relation to apex of right lung, extending posteriorly down to tenth intercostal space.

Aspiration produced 150 ml. of dark unclotted blood. Dyspnœa disappeared immediately, and hæmatoma was gradually absorbed (confirmed by radiography). (See fig. 5.)

The full vasodilatation that followed sympathetic block is an obvious pointer that this will be a useful measure in the management of such cases. Since the main vessels were pulsating fully thrombosis can be excluded, and the beneficial effects of the sympathetic block must be due to its effect in releasing spasm in the distal arterioles. Two further facts of significance are: (1) brachial-plexus block was as effective as the more difficult posterior sympathetic block; and (2) the arteriolar spasm recurred within four hours. Sympathetic block in a heparinised patient is well shown to be hazardous.

Case 3.—An adult, with gastric ulcer, admitted for partial gastrectomy was given heavy spinal 'Nupercaine,' followed by 4 ml. of 10% thiopentone and then nitrous oxide and oxygen. Injection reported as painful, hand became white, and on skin of forearm irregular blue patches developed. Radial pulse full and continued thus for whole day. Entire hand anæsthetic, as also distal half of ulnar aspect of forearm. Motor power poor: feeble finger flexion and extension possible; wrist could be held against gravity; but pronation and supination impossible. Flexion and extension of elbow good.

Next day circulation improving, pulse reported as "good," but forearm muscles firm and indurated. Circulation in fingers gradually improved.

On fifteenth day after injection, sudden loss of radial pulse; hand became cold and white, and finger and wrist movements impossible. Four days later mummification began. Oblique irregular line of demarcation developed in upper third of forearm.

Forearm amputation, thirty days after injection, made possible by dissecting out muscles, which were all avascular except for biceps and triceps; 2-in. bone stump was left. Ulnar and radial arteries and last 3 in. of brachial artery thrombosed. Normal pulsating segment not observed. Accompanying venæ comites not thrombosed. A useful small elbow stump saved (see fig. 6).

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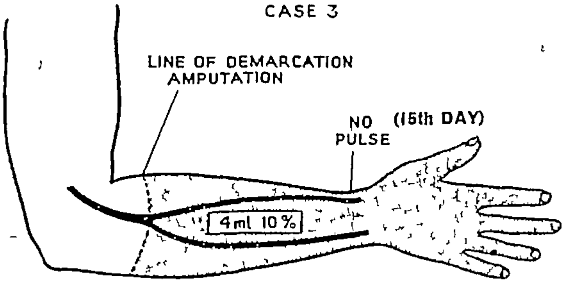

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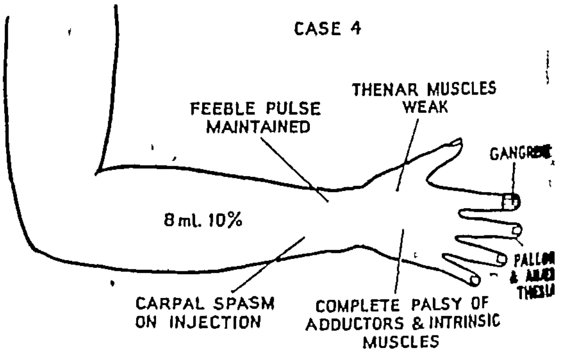
CASE 4
FEEBLE PULSE MAINTAINED
THENAR MUSCLES WEAK
GANGR
8 ml. 10%
PALL
&
THE
CARPAL SPASM ON INJECTION
COMPLETE PALSY OF ADDUCTORS & INTRINSIC MUSCLES

Fig. 7.

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Swelling of hand gradually subsided, movements of fing became full, and colour of hand returned to normal exc

Later, some of contracted muscle mass was excised by his urgeon; section showed complete muscle necrosis (fig. 14).

I again saw this patient some $2^{1}/_{2}$ years after original njection. He then complained that with cold the fingers went a dirty grey, movements became difficult, and finger numbness prevented him from using hand. On any heavy work hand went dead white.

The fingers do not appear to have been affected, xcept for later secondary effects; this suggests that the hiopentone was embolised in the main to the forearm nuscles and thenar space. Death of the muscles of the henar space indicates that the radial artery must have een responsible for most of the supply, and that spread f the thrombosis along this vessel into the distributing ranches blocked the ulnar-artery anastomosis. This s very much akin to the march of events with an arterial mbolus, distal clot blocking the collateral vessel path. The hand anæsthesia, which apparently took well over 18 months to recover, has two possible explanations: (1) forearm œdema, with compression of the vascular supply of the nerve-trunks (the œdema was, however, never very extensive); and (2) spasm or thrombosis of the vessels of supply to the medial and ulnar nerves. The loss of power in all the intrinsic muscles of the hand suggests the latter ætiology—ischæmia of the main nerve-trunks. The "Raynaud's phenomenon" sensitivity to cold is an interesting observation which has not been encountered in any of the other cases. There has, however, been no opportunity for the late examination of the recovered patients.

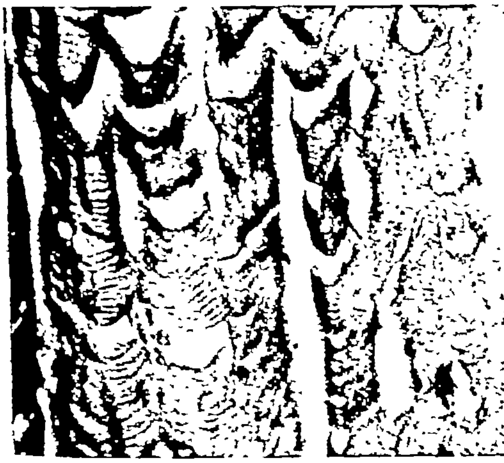

Fig. 14—Biopsy specimen showing coagulation necrosis of thenar muscle in case 8.

Case 9.—Male, 52, with prolapsed iris. Anæsthesia induced with thiopentone. 10% solution. The "vein" was superficial and easily entered on the first attempt. After 4 ml. complaint of severe pain in arm—"you're breaking my arm." Aspiration showed free blood-flow, injection continued. Noted "he took a little longer to go under than usual."

On recovery from anæsthetic, pain in arm was first thing complained of. Nothing abnormal noted. Some 4 hours later, thumb and index finger were whiter than rest of hand, and a bulla $^{1}/_{2}$ in. in diameter, filled with clear fluid, had appeared on thenar eminence.

Next morning, thumb and index finger dusky, and patient had severe pain in forearm and a "sensation as of tight band" round distal phalangeal joints of thumb and index finger.

By evening, distal phalanges were dark purplish-black, fading to dusky grey over second phalanx. On thumb, discoloration extended farther on palmar aspect than on dorsum, reaching thenar eminence, where there was purplish-yellow blotchy discoloration. Hand and forearm were much swollen up to elbow. Generalised erythema of forearm, œdematous area being slightly warmer than on other side. Thumb and index phalanges anæsthetic and cold to touch.

Forty-eight hours after injection, irregular patches were present over forearm, largest being over radial border. These patches later developed purplish central area. Radial pulse felt normal and arterial wall in "good condition."

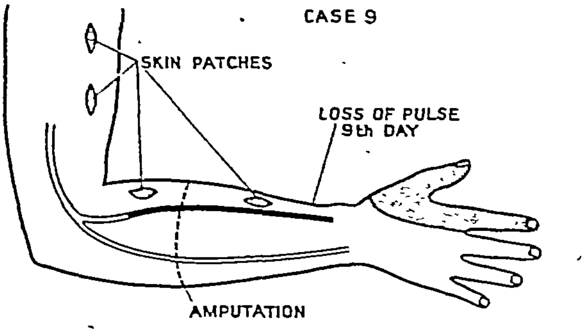

Fig. 15.

Hand continued thus for 5 days; thumb and index finger then became black and gangrenous, and skin patches on forearm began to slough.

Nine days after injection, radial pulse, which had remained normal, "suddenly" disappeared. Cubital fossa was therefore explored under brachial-plexus anæsthesia. Basilic vein found thrombosed. Radial artery thread-like and did not pulsate; ulnar branch pulsating.

Brachial artery was then explored; its pulsations were normal, and vessel was opened to extract any clot. Intima appeared normal, no clot was found, and vessel was resutured. One inch of radial artery was resected: there was no return bleeding from distal end.

Microscopical examination showed intimal swelling and fibrin filling vessel lumen, but channel still present.

Some 6 weeks after injection, thumb and index were amputated. Unfortunately infection supervened, and final amputation had to be performed through forearm some 3 months after original accident (see figs. 15–17).

The original injection was probably in the brachial artery, but it seems that most of the thiopentone spent itself, via the radial artery, in the thumb and index finger. The disappearance of the pulse on the ninth day is not easy to explain, since the vessel was filled with fibrin rather than with clot, a finding to be expected usually where there has been long-continued vascular spasm. Microscopy showed considerable swelling and damage of the intima, which confirms that this vessel carried the brunt of the solution. The sloughing skin patches above and below the site of injection appeared to be due to local effects of thiopentone. An explanation of the high distribution of some of the skin patches on the arm has already been attempted. It is clear that there was thrombosis, at an early stage, of the digital vessels of the thumb and index, for these fingers never became swollen, indicating complete arterial arrest. The finding of a thrombosed cubital vein suggests that this may have been traversed to reach the artery.

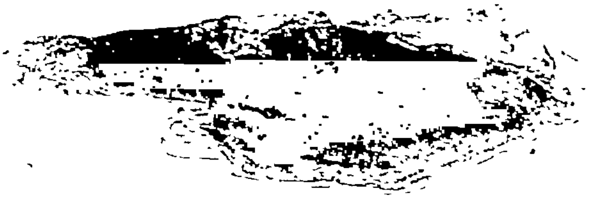

Fig. 16—Gangrenous segment of hand amputated six weeks after intra-arterial thiopentone (case 9).

Case 10.—This case has been reported by Macintosh and Heyworth (1943).

Patient was given 5 ml. of 10% thiopentone into an aberrant ulnar artery.

Thin rubber venous tourniquet and "best-looking vessel" selected. No. 17 needle, blood aspirated, and injection begun at moderate speed. After 5–10 sec. patient complained of very severe pain in whole hand, as "though boiling water elbow. Such high thrombosis can only be explained on the assumption that the high Trendelenburg position, with consequent depression of the shoulder obliterated the pulse during the injection. The solution was thus injected into a non-pulsating vessel, and the high ascent of the solution and the sustained action of the thiopentone were thus made possible.

Case 7.—Man, 51, "highly strung," operation for hammer toe. Thiopentone 10% injected into a vessel on medial side of elbow. After 2 ml. patient indicated that he was "going off." A further 3 ml. then injected; patient now complained of severe pain in hand, saying "it feels as if on fire" and tried to vomit. Needle withdrawn and remaining 5 ml. injected into adjacent vein. Light gas-oxygen and ether continued.

Two hours later, patient looked very pale and was writhing in great pain. Hand cold, fingers ashen, dorsum of palm dead white. Patchy discoloration on ulnar border of arm. Both pulses present; equal blood-pressure readings. Superficial veins in forearm somewhat engorged. No hand œdema, no induration or swelling at elbow to suggest local leakage of thiopentone or blood.

Some two hours later, forearm was much swollen; muscles appeared to be under great tension. Wrist and fingers held semi-flexed; attempts at active or passive movements caused acute pain. Engorgement of superficial veins more pronounced. Both radial pulses present; blood-pressure readings equal in both arms. Ulnar pulse could not be felt in either wrist. Tips of all fingers dusky and did not blanch on pressure. Palm and dorsum still deathly pale; no swelling distal to wrist. Pain of acute burning type, affecting diffusely all fingers and whole hand; patient in agony and unable to lie still.

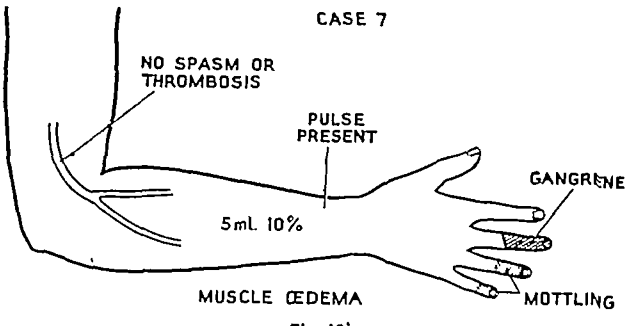

Fig. 10.

Five hours after injection, swelling of forearm rapidly increasing, operation undertaken. Deep fascia incised from medial side of antecubital fossa to 3 in. above wrist. Immediate pronounced bulging of muscles, which were, however, of normal colour. Dissection showed that brachial artery branched high up in upper arm, and radial artery descended superficially just beneath deep fascia. Radial artery, dissected to middle third of forearm, showed strong pulsation throughout its length, with no indication of spasm or thrombosis. Ulnar artery similarly normal.

Circulation in thumb and index appeared to improve. Palm developed a mottled red flush, but dorsum unchanged. Reflex heating started. By next morning circulation of the index and thumb appeared normal; ring and little fingers were a mottled reddish-blue, but middle finger dark blue very black as far as finger knuckle. Pain in hand easier, in middle finger still intense.

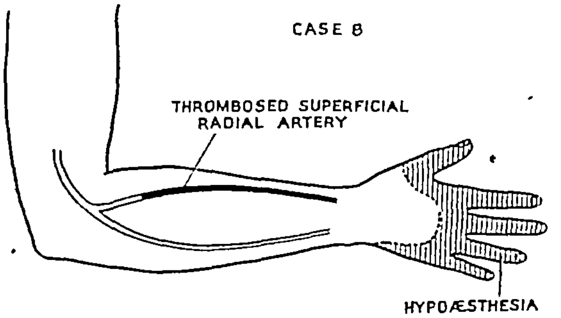

Fig. 11.

Within 48 hours hand regained normal colour, except terminal phalanx of middle finger and tip of ring fin, Middle finger still much discoloured; ring finger showing greyish-blue mottling. Movement and sensation had returned. Dorsum of hand and wrist had, however, become swollen, where previously not swollen; this may have been due to posture, for high elevation caused pain, which was relieved to some extent by horizontal or dependent po

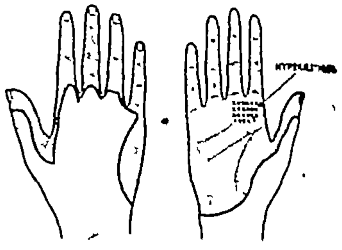

Fig. 12—Area of hypoæsthesia (stippled) hand of case 8 fifteen months after intra-arterial thiopentone.

Ultimate outcome was loss of terminal phalanx of finger only (see fig. 10).

The successful issue in this case is first of all due to the skill and care of the surgeon (Mr. E. B. Jamieson, F.R.C.S.), whose very full notes I am able to relate, and who gave me the opportunity of seeing the patient. Secondly, the enormous muscle œdema appears to indicate that the pathway of most of the solution was fortunately via the forearm muscles; such pronounced early swelling *of the forearm may thus be useful in attempting to assess* the prognosis. The radial pulse was never lost, and the equal blood-pressure readings indicate that there could have been no spasm of a major vessel.

Case 8.—Male, 39, nephrectomy. Details of anæsthesia not available, but according to brief notes "after small pentothal injection there was complaint of pain; the needle therefore was withdrawn and injection continued into opposite arm." According to patient, immediately on injection he had agonising burning pain in the hand. When he awoke he had considerable pain, especially over thenar eminence. Possibility of thiopentone being responsible at that time not entertained.

Two days later, forearm was swollen, but "not the hand." There was "glove anæsthesia" of entire hand, feeble movement of fingers only possible, though wrist movements normal (fig. 11). Because of "glove anæsthesia" the patient was regarded as hysterical, and opinion of neurologist was sought, who noted absence of radial pulse and suggested that thiopentone had been injected into artery.

Fig. 13—Hand of case 8 two and a half years after intra-arterial thiopentone, showing adduction contracture of thumb following necrosis of thenar muscle.

When I first saw patient fifteen months after accident, he said he developed black and blue patches on forearm, which blistered. Healed scars were still present at my examination. Patient complained that he still had much pain at night, and hand felt as if skin was too tight ("like having on a too tight pair of gloves"). There was hypoæsthesia of entire hand, with a small patch of hyperæsthesia in palm (fig. 12). Thumb held in tight adduction (fig. 13), and muscles of thenar interspace and abductor pollicis felt woody hard. Finger movements now full, but fingers showed wasting of pulp, loss of transverse skin ridging, and distorted nail growth; they were warm. Radial pulse absent, and vessel could be traced upwards as a thrombosed cord.

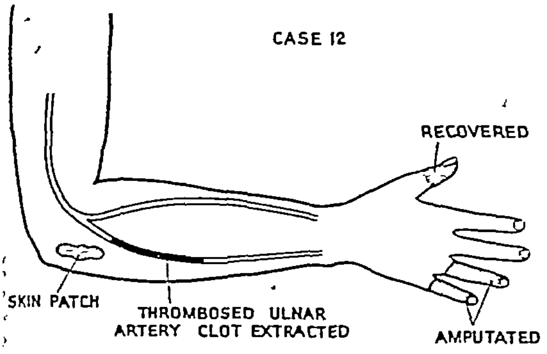

Fig. 20.

Pathologist's Report.—Brachial artery: some endothelial ickening of wall and a little fibrin deposited deep to dothelium.

Radial artery (3 cm. long by 2 mm. broad): endothelial bliferation, and at one point a small mass of fibrin which s clearly present before removal. Rest of arterial lumen tupied by unorganised blood.

Muscle: a small piece, taken at operation, "shows early generate changes, with loss of cross-striation and some normality of staining. There are also places with prolifera- n of sarcolemmal cells. These degenerative changes are ch slighter than has been observed in other ischæmic scle."

After operation, hand became discoloured to middle of rearm, and cold. Three weeks after exploration a forearm putation was done, leaving a $2^1/_2$ in. stump. Pathologist ported "no thrombi in distal smaller arterials," and con- ered that "obliteration responsible for death of limb ok place at some point above site of amputation" (see 19).

Recurring spasms of pain, like those the child had ter discharge from hospital, are often noted in limbs with vere ischæmia. The sudden attack of pain a week ter must indicate an extension of the thrombosis. The ild was playing at the time; experience with arterial ease shows that, in a thrombotic lesion, extension the level of thrombosis may sometimes be precipitated exercise. Late thrombosis on the eighth day is ten seen with venous thrombosis—e.g., in the leg. right (1947) has demonstrated that about that time ter operation there is an increase both in number and "stickiness" of the platelets, and this may be a ponsible factor in the late thrombosis in the thiopentone es. Arterectomy certainly did not relieve the condi- n; the value of this procedure, in the light of perience with other cases, is discussed below.

Case 12.—Reported by C. W. H. Van der Post (1942). ven in all 6 ml. of 10% thiopentone for dilatation and curettage. ncture was difficult. After injection of 1 ml. an immediate d flush spread down arm, and "whole vein down arm was rombosed." Operation was successfully completed.

Next day, terminal phalanx of thumb and two fingers were going gangrenous." Arm œdematous to just above bow, and little and ring fingers insensible to touch and mperature; terminal phalanx of thumb cyanosed, with e or two bullæ in skin. Radial pulse was palpable, and nar artery could be palpated only as far as elbow. Bluish- een patch round inner aspect of elbow.

Surgeon explored elbow under general anæsthesia and found anomalous origin of ulnar artery, which arose from brachial tery a full inch above elbow and then passed superficially flexors of forearm. Ulnar artery was opened just above bow, and thrombus about $^3/_4$ in. long and $^1/_8$ in. thick s extracted; vessel incision was sutured.

Next day, some improvement of arm, fingers becoming rm, and sensation returned. Convalescence interrupted severe uterine hæmorrhage. Finally terminal phalanges ring and little fingers were lost, whereas thumb recovered e fig 20).

Injection was into the easily mistaken superficial nar artery. Arteriotomy, with extraction of the clot, seems to have been valuable, for the ultimate result can be regarded as satisfactory. The immediate formation of thrombus fits in very well with the march of events in case 10. It must be remembered that severe hæmorrhage, as in case 12, leads to intense vasoconstriction and will influence the recovery of the ischæmic limb. The involvement of the thumb shows that, despite the ulnar-artery puncture, the thiopentone was widely distributed. There is the less likely alternative explanation that, if the brachial-vessel division was very low, some of the thiopentone may have been injected in retrograde manner into the brachial artery and then distributed via the radial artery.

Other Cases.—I have had personal communications from at least six other anæsthetists who believe that they have injected 5% thiopentone intra-arterially with no subsequent effect except for a flushing of the limb. I have seen one case after such injection and noted the flushing of the limb and that there was not the slightest sign of extravasation of blood to suggest that the artery had been punctured. This patient had a particularly mobile elbow, and on hyperextension the brachial artery came well forward, was tightly stretched, and invited injection. Lundy (1942) has reported the intra-arterial injection of 8 ml. of $2^1/_2$% thiopentone in 2 cases, with no untoward effect. Adams (1944) reports injection of 5 ml. of 10% thiopentone with no near or remote effect, which is indeed surprising. Lees (1943) has reported a case where, after an injection of 5% thiopentone there followed burning pain and a spreading red flush down the forearm; he felt sure that the injection was "intravenous," but the story is typical of intra-arterial injection.

(To be concluded)

TRANSORBITAL LEUCOTOMY*

WALTER FREEMAN
M.D., Ph.D. Washington, D.C.

From the Department of Neurology and Neurological Surgery, George Washington University School of Medicine

LESS than a year after the introduction of leucotomy by Moniz (1936), Fiamberti (1937) proposed a simplified operation, which later he carried out, on the frontal lobes by way of the orbital plate. This route had been used before for certain intracranial procedures such as ventricular puncture (Dogliotti) and intracerebral malaria inoculation (Ducosté) with ease and safety. Fiamberti insisted on these aspects, but did not compare the effectiveness of the method with that of other types of leucotomy. Then the war prevented further communications, and only in 1947 did Fiamberti's work again come to notice outside Italy. The results were still not very substantial, and the papers by Fiamberti (1947), Ali (1941), and Ferraro (1942) gave no clear idea of the virtues of this approach, merely denying its vices. In justifying his novel approach Fiamberti stated: "In the present state of affairs, if some are critical about the lack of caution in therapy, it is, on the other hand, deplorable and inexcusable to remain apathetic, with folded hands, content with learned lucubrations upon symptomatologic minutiæ or upon psychopathic curiosities, or, even worse, not even doing that." In a recent personal communication Fiamberti writes that he has performed about 100 of these operations without mishap, but he is still indefinite about the results.

Two important pieces of research, the results of which have not yet been published, call attention to the possibilities of transorbital leucotomy as a valuable addition to the therapeutic armamentarium of the

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* A paper read at the Burden Neurological Institute on July 11, 1948.

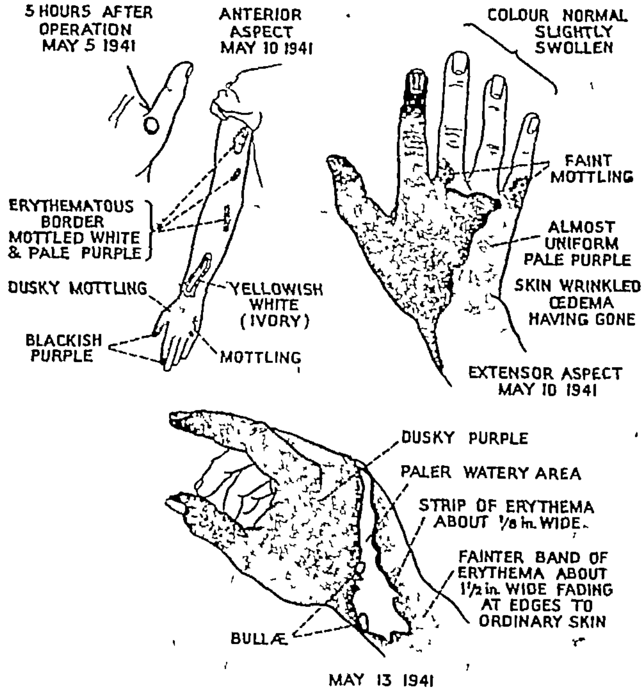
5 HOURS AFTER OPERATION MAY 5 1941
ANTERIOR ASPECT MAY 10 1941
COLOUR NORMAL SLIGHTLY SWOLLEN
ERYTHEMATOUS BORDER
MOTTLED WHITE & PALE PURPLE
DUSKY MOTTLING
YELLOWISH WHITE (IVORY)
BLACKISH PURPLE
MOTTLING
FAINT MOTTLING
ALMOST UNIFORM PALE PURPLE
SKIN WRINKLED ŒDEMA HAVING GONE
EXTENSOR ASPECT MAY 10 1941
DUSKY PURPLE
PALER WATERY AREA
STRIP OF ERYTHEMA ABOUT 1/8 in. WIDE.
FAINTER BAND OF ERYTHEMA ABOUT 1½ in. WIDE FADING AT EDGES TO ORDINARY SKIN
BULLÆ
MAY 13 1941

Fig. 17—March of events in case 9: hand and forearm during first week after intra-arterial thiopentone.

was being poured on it, and flames shooting from ends of fingers."

Injection stopped and "vessel" found swollen to size of a lead pencil, hard, and pulseless for about 4 in. distally —i.e., in its superficial course. Patient went grey and started sweating; about 45 sec. later lost consciousness. Anæsthesia continued with nitrous oxide and oxygen.

Some 5 min. later, ulnar three fingers and hypothenar eminence cold and blanched. This lasted $^1/_2$–$^3/_4$ hour; 15 min. after injection, mottled purple and red purpuric rash developed on lower part of ulnar aspect of forearm, and spread to hypothenar eminence. This lasted about five days.

After operation patient woke with very severe pain in hands; morphine necessary. Next morning moderate œdema of whole hand and wrist. Artery hard, but not so swollen as immediately after injection.

Ten days later, patient symptomless but remained with a thrombosed aberrant ulnar artery. Similar aberrant vessel on opposite arm (see fig. 18).

The ultimate effect of this injection of 10% thiopentone was indeed fortunate; some gangrene of the fingers at least was to be expected. An immediate thrombosis appears to have followed the injection, and this was also observed in Van der Post's (1942) case (case 12). Serious sequelæ are less likely after puncture of an aberrant ulnar artery (see anatomical explanation below). The vessel in case 10 pursued a subcutaneous course and pierced the deep fascia in the distal part of the forearm.

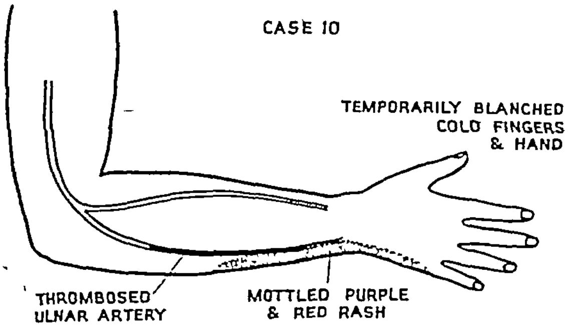
CASE 10
TEMPORARILY BLANCHED COLD FINGERS & HAND
THROMBOSED ULNAR ARTERY
MOTTLED PURPLE & RED RASH

Fig. 18.

The blanching of the fingers, lasting only $^1/_2$–$^3/_4$ must imply that there was only temporary spasm of vessels. The character of the pain indicates that injection was certainly intra-arterial, and the fact all the finger-tips were affected indicates a fairly distribution of the thiopentone. Why there were no effects I cannot explain.

Case 11.—This case has also been reported by Macint and Heyworth (1943).

A boy, aged 5 years, was given 1·5 ml. of 10% thiopento as induction before tonsillectomy. An hour later, ch complained of severe pain in hand and distal part forearm, which was blanched from elbow downwards about an hour colour returned, pain appeared to pass off, a child went to sleep. Discharged from hospital two days lat

Readmitted a week later because of sudden severe p in forearm. According to parents, child had continued complain of pain in right arm from date of discharge; p prevented him from sleeping. As time went on, pain wrist seemed to increase, and a blue mark in middle of rig elbow and several black marks on ulnar aspect of forea were noted.

Hand and arm were warm and of good colour. Chi kept forearm and wrist bent and could not move the Three days later, hand had improved; child managed turn over leaves of his book but could not hold anything right hand. Five days after injection, child appeared to free from pain, played, and moved his hand.

On *eighth day* he complained that arm was again painf and stiff. He went out to play but came back screaming w pain; hand white, nails blue.

In hospital, hand was ischæmic, cold, with blue nai Forearm was held in semi-flexion, and wrist in palmar flex fingers were tender on attempting dorsal flexion. Stro pulsation could be felt in brachial artery up to middle of elbo where it suddenly ceased. No radial pulse. Hand was an thetic as far as middle of hand, though such sensation cou not be determined accurately in a child. There were a fe

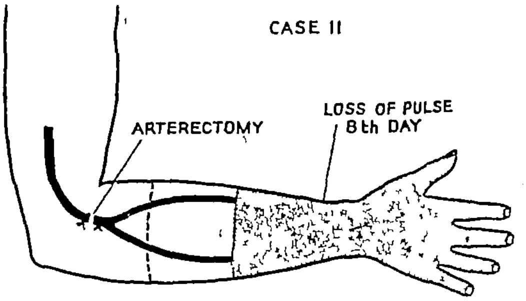

Fig. 19—Broken line indicates site of amputation.

bluish spots in middle of forearm, and there was a da area over injection site.

Observation continued for two days, during which the appeared to be recurrent spasms of pain in wrist. No mov ment was possible in fingers, hand remained cold, and senso loss appeared to be extending upwards.

Ten days after original injection, elbow was explore Brachial artery was pulsating throughout antecubital fos but no pulsation could be seen in its divisions. Radial arte was so blue that it was first mistaken for venæ comites. Aft a temporary clamp had been placed on brachial arter radial artery was divided 0·5 cm. from its origin. Lumen w found filled with old dark blood-clot, which appeared extend entire visible distance of radial artery—4 cm. O removal of clot from proximal end, vessel began to ble slowly, and this end was therefore ligated. Entire brachia vessel division was now exposed; ulnar artery was swolle glossy, and soft, with doubtful pulsation. Brachial arte appeared swollen ("abnormal bulge") in terminal 1·5 cm and it was decided to resect this section of brachial arter up to its bifurcations. Heparin injected into ulnar an radial arteries, but very little flowed down. Finally enti visible length of radial artery, which contained clot througho was resected. Portion of radial artery which was handle was smaller than unhandled portion, even though clot extende throughout.

ll three patients recovered and went home, but their efulness is limited.

RESULTS

General and undesirable changes in personality after ansorbital leucotomy are usually minimal. Only casionally is there a certain indolence and tactlessness. r the most part the patients are quite themselves, the ly thing lacking being a certain subtlety and a modicum insight into their own mental mechanisms. Personality s by Dr. Mary Frances Robinson have revealed rich- as well as depth in patients who have been operated y the transorbital route.

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Transorbital leucotomy has proved valuable in mental spitals where specialised neurosurgical techniques are rarely available. It is also applicable in patients who are not recovering but nevertheless do not seem to be sick enough to require major leucotomy. The operation can be performed by the psychiatrist as soon as he has familiarised himself with the landmarks and practised on the cadaver. It requires little more preparation of the patient than is demanded for electro-shock therapy; the operation is brief, safe and simple. Even the route of approach to the brain requires no preparation, since the conjunctival sac is normally sterile and a copious flow of tears is promoted by the electric current. No complications due to infection have been reported, but sulphadiazine 4 g. in divided doses is given as a routine after operation.

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SUMMARY

Frontal leucotomy can be performed safely and effectively by the transorbital route of Fiamberti during the phase of coma following electro-shock.

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"... The world of the future—if any world survives—will be a world of diversity, held together by a conception of common interests. It will be a world in which many political faiths and economic creeds are tolerated and widely differing points of view fertilise each other for the common good. Our challenge in this generation is to discover the common interests, the terrain of possible collaboration, the overlapping areas of curiosity and sympathy, of aspiration and mutual advantage, that bind the human race together regardless of ideologies or boundary lines. The search for these rallying points of unity, the development of new techniques and areas of coöperative action where ideas and experience can be pooled and combined—this is the immediate task; this comes first; this is the foundation of the ultimate structure of a united society.... In spite of all evidence to the contrary the things that divide the world are trivial as compared with the things that unite it. The mutualities of human beings everywhere far exceed their divergencies."—Dr. RAYMOND B. FOSDICK in the *Rockefeller Foundation Review* for 1947.

psychiatrist. One of these, by the Columbia-Greystone associates, reported at the New York Academy of Medicine in April, 1948, indicated that the favourable results obtained with frontal leucotomy may be duplicated by excision of the cortex covering the frontal poles of the brain, and in particular those parts termed areas 9 and 10 on the Brodmann chart. Furthermore, the investigators claimed that the changes in personality following "topectomy" are much less severe than those following leucotomy. The series of cases is rather small (24) and the period of postoperative observation has been rather short for assessment of final results, but of the 11 carefully selected patients in whom areas 9 and 10 (and part of 46) were excised 10 were usefully occupied after discharge from hospital.

The other investigation, by Spiegel and Wycis and their collaborators, reported at the meeting of the American Neurological Association in June, 1948, involves a direct attack on the medial nucleus of the thalamus with a stereotaxic instrument based upon the Horsley-Clarke apparatus. After the electrocoagulation of 3–5 minute areas in each medial thalamic nucleus patients are said to develop disorientation, incontinence, masking of the face, plateau speech, and abolition of the emotional component of the psychosis. Clinical improvement is comparable with that observed after leucotomy. This research bears out the theory of Freeman and Watts (1947) that the affective change in the patient is due not so much to interference with the cerebral cortex as to the retrograde atrophy that affects the thalamus once its connexions with the cortex have been severed. The topectomy investigation indicates that a more restricted operation on the frontal lobes may successfully relieve the patient without producing a serious change in personality.

Consequently, transorbital leucotomy, which undercuts areas 9 and 10, seems to be a valid procedure.

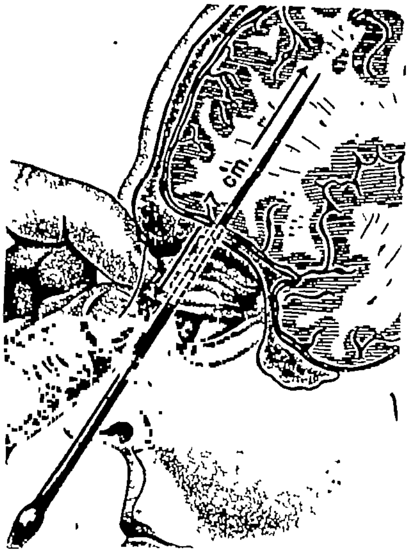
Our own studies on the cadaver in 1945 confirmed the fact that the orbital plate could be rather easily perforated without danger to structures within the orbit and without encountering large intracranial vessels; and that the thalamofrontal radiation could be severed fairly far anteriorly without disturbing the cortex except to a minimal degree.

Early in 1946 10 patients were subjected to transorbital leucotomy with encouraging results. Two years later (Freeman 1948) 6 of them were fully restored and only 1 was in hospital. The series has been extended since then to more than 100 cases, in collaboration with doctors in mental hospitals in South Dakota, West Virginia, California, and the State of Washington (Jones and Shanklin 1948). There have been no deaths.

TECHNIQUE

We have found that transorbital leucotomy can be performed satisfactorily in the postconvulsive phase of electro-shock. Electro-shock appears to have a generally disrupting effect on cortical activity, temporarily abolishing the psychotic manifestations and bringing the patient into a brief period of increased adaptability. When leucotomy is also performed, the effects of the electro-shock seem to be at least protracted, and often permanent. A few operations under ordinary anæsthesia have been performed by others, however, and equivalent results are reported. Nevertheless, electro-shock requires so little preparation and is so familiar to the psychiatrist that it seems to be the method of choice.

To maintain the patient in a somewhat prolonged phase of coma, two convulsive doses of electricity are given, the second about one or two minutes after the first convulsion has subsided. After the second convulsion a towel is placed over the patient's nose and mouth to prevent contamination by saliva and nasal secretions. The upper eyelid of the patient is pinched between t and finger, bringing it away from the eyeball. point of the transorbital leucotome is then introd into the conjunctival sac and moved around agains roof of the orbit until the top of the vault is encount The leucotome is brought parallel with the bony of the nose, and its base is tapped lightly with a ha to drive it through the orbital plate. To aim the l tome properly the shaft must press rather strongl the eyeball, but no harm to the globe has been except for occasional subscleral hæmorrhage.



Transorbital leucotomy.

The transorbital leucotome† consists of a tool shaft 12 cm. long and 4 mm. in diameter, tapering fo last 6 cm. rather fine with a slight Its handle is long and 8 m diameter equipped wi cross-arm a base. The is graduate centimetr double line marked at 7 which is the frequently point.

When the cotome reached the level, its is pushed lat as far as the gins of the will permit sever the fib the lower po of the thalamofrontal radiation. It is again return mid-position and gently driven to a depth of 7 cm. al in the plane of the bony ridge of the nose (see figure) this depth it is possible, by swinging too far, to la arteries in the depth of fissures on either the m or the lateral surface of the frontal lobe; and, sinc thalamofrontal radiation is a rather narrow band i region, a movement of only 15–20° laterally and med is sufficient. When the sweeps of the instrument h been made, it is withdrawn, and moderate pressu maintained over the eyelids for several minute prevent excessive bleeding into the orbit.

Unless the patient is still deeply unconscious, additional electroconvulsive shock should be administ before the other side is operated on. Patients seem tolerate multiple convulsions quite well. In view of refractory period, it is usually necessary to increase time of passage of the electric current by repea tripping of the switch until the convulsive thresho reached. No complications have been encountered doing this. After the convulsion has subsided, the ot side is operated on in the same way.

Recovery from transorbital leucotomy can be rapid. Sometimes within an hour the patient may awake and talking. Headache is usually present, occasionally nausea; incontinence is rare. Swelling the eyelids is common but tends to clear in a day or t Ecchymosis is often encountered, and the discolorat may persist for two weeks. The swelling is probably to the escape of cerebrospinal fluid through the orb plate. Rhinorrhœa has not been observed. Complicati have developed in only 3 of more than 100 operati In all of these there was bleeding, with very severe in and paralysis in one, and mild hemiparesis in the oth three patients recovered and went home, but their fulness is limited.

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† Made by H. A. Ator, 5332–29th Street, N.W., Washington

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INCONTINENCE OF URINE IN THE AGED

THOMAS S. WILSON
M.D. Belf.
GERIATRICIAN, CORNWALL COUNTY COUNCIL

INCONTINENCE of urine has long been recognised as particularly likely to occur at either extremity of life. Allen (1733), quoting the "Sentiments of Ettmüller—Of an Incontinency of Urine," states:

> "The Cause of an involuntary discharge of Urine, is a Deficiency in the Constriction of the Sphincter of the Bladder, by a Palsy, Contusion, by staying too long in cold Water, by a difficult Labour, and sometimes it happens to Women in the last months of their going with Child. . . . Children and Old People are the common Pissers-a-bed, but these come not to the Physician for Cure."

Allen does not give the reason for this attitude of therapeutic negativism, though he later says: "in old Persons it is altogether incurable, unless hot Baths relieve them."

Though in recent years a considerable amount of attention has been devoted by medical writers to the ætiology and treatment in children of a persistent inability to control bladder function, a similar disability in the aged has tended to be ignored by them, and in practice has almost invariably been regarded with a singular fatalism.

Sphincteric weakness resulting from senile muscular atrophy has persisted to be the common explanation of the condition advanced by most modern writers, but little or no evidence has been produced in support of this assumption. Langworthy et al. (1937), on the other hand, after studying aged incontinent patients, concluded that injury to the central nervous system was the most frequent cause of the disability, and Geist and Salmon (1943) relate the incontinence of some postmenopausal women to a senile vaginitis and œstrogen deficiency.

MECHANISM OF MICTURITION

The neurophysiology of the bladder and its sphincters has been described by so many workers that I do not propose to discuss in detail the mechanism of normal micturition. This has been admirably summarised by Denny-Brown and Robertson (1933) as follows:

> "The process of storage of urine and its evacuation occurs in a reservoir of which the distension excites a tendency to an automatic discharge.
>
> "The primary factor in discharge is contraction of the wall of the bladder with an accompanying secondary reciprocal relaxation of both sphincters.
>
> "Control of discharge and utilisation of the reservoir above about 50 c.cm. depends upon conscious and unconscious inhibition of vesical contraction. If necessary this may be reinforced by active voluntary excitation of the external sphincter until vesical contraction is overcome.
>
> "More usually the process pursues a course of progressive complete adaptation without the occurrence of sufficiently powerful vesical contractions to be accompanied by full relaxation of the internal sphincter until conscious or unconscious control of vesical contraction is released by voluntary effort."

The afferent and efferent arms of the reflex arc concerned in bladder contraction lie in the pelvic parasympathetic nerves, and the arc is completed in the 2nd, 3rd, and 4th sacral segments of the cord. Cortical control of the bladder, which is absent in the young infant but is normally acquired during the first few years of life, is exercised by means of inhibitory impulses transmitted from the cortex to the sacral region by spinal pathways situated in the dorsal halves of the lateral columns (McLellan 1939).

INCIDENCE OF URINARY DYSFUNCTION

Some degree of urinary dysfunction in the aged is so common that it has come to be regarded as almost normal. Of 35 male and 33 female chronic sick pa over the age of 70, only 5 and 9 respectively were from urinary complaints. In both sexes the commo symptom was increased frequency of micturition, most of the patients also complained of precipitate, imperative, micturition. The findings were as follow

Sex	*No. of patients*	*Diffi-culty*	*Slow-ness*	*Preci-pitancy*	*Fre-quency*	*Incon-tinence*	*Noc-*
Male ..	35	3	7	19	22	11	[illegible]
Female ..	33	8	11	17	23	14	[illegible]
Totals ..	68	11	18	36	45	25	[illegible]

Many of the patients who complained of slownes difficulty in initiating micturition related this sympt to nervousness or emotional upsets, and in several c the information was volunteered that voiding facilitated by hearing the sound of running water.

INVESTIGATION OF URINARY FUNCTION

For this investigation 36 aged males and female the chronic sick wards were selected at random. of the patients investigated had some urinary dysfunc 21 being incontinent, but some who did not complain urinary symptoms were included in the series as contr At the outset of the investigation, or shortly befor began, most of the 36 patients were bedridden, but of them were mobilised, at least to the extent of able to sit by their bedside, some being re-educated walking-machines.

In each case the reaction of the bladder in respo to gradual distension with fluid was determined wi simple cystometer (fig. 1). A 1 in 10,000 solution potassium permanganate was warmed to about b temperature and allowed to enter the bladder at the r of about 10 ml. a minute. Serial readings of bladd pressure recorded on the manometer were chart graphically against the volume of fluid instilled.

Technique

Before cystometric examination the patients were instruc to cough, and the presence of any stress incontinence noted. They were then told to pass urine, after which t were placed on the couch, the females in the lithot position, and a catheter was passed with strict aseptic cautions, the residual urine being withdrawn and meas The ease or otherwise with which a catheter was passed some indication of the degree of obstruction to the ve outlet. At this stage the state of the vagina and ure orifice could conveniently be observed, and the presen cystocele, retocele, or senile vaginitis noted. In many c a smear was made from the vaginal mucosa to determine state of the epithelial cells.

The apparatus shown in fig. 1 was next connected to catheter, the zero mark on the manometer having b

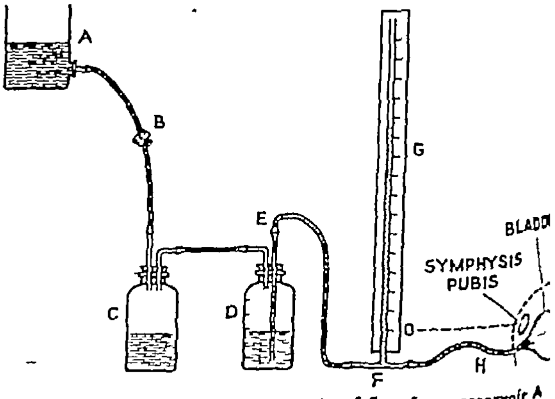

Fig. 1—Apparatus for cystometry: rate of flow from reservoir A bottle C is controlled by screw-clip B; fluid entering bottle C places air, which in turn displaces potassium-permanganate sol from graduated bottle D past one-way valve E to T-junction F thence via catheter H into urinary bladder. A rate of flow drops a minute into C gives a rate of flow of 10 ml. a minute bladder.

adjusted to the same level as the symphysis pubis, and the pressure in the system being zero. The screw-clip B was adjusted so that fluid was entering the bladder at about 10 ml. a minute, and throughout the examination the screw-clip was regulated so that this rate of flow was kept constant. The one-way valve E ensured that during contractions the fluid was not forced back into bottle D.

During the examination the patient was questioned periodically about the presence of bladder sensations, and was instructed to hold his water, especially when a rise in pressure indicated a bladder contraction. That the patient was in reality attempting actively to inhibit bladder contractions could be determined by observing the voluntary musculature of the perineum for the presence of contraction, which is associated with such an inhibiting attempt.

The amount of solution instilled into the bladder did not exceed 400 ml. If, however, distension became painful before this amount was instilled, the instillation was discontinued. If no reflex bladder contraction had taken place during the period of filling, the patient was instructed to attempt to void before the apparatus was disconnected.

The apparatus was next disconnected from the catheter, and the bladder emptied. It is important that the bladder should be emptied, if possible, during an active vesical contraction, rather than passively drained through the catheter.

Besides cystometric examination, a standard clinical examination was carried out on each patient, with special reference to the presence of lesions of the central nervous system, urinary infections, senile vaginitis, prostatic enlargement, and local abnormalities of the bladder outlet. There were no facilities for cystoscopy and a more detailed knowledge of the state of the bladder than that afforded by routine methods was unobtainable. As already stated, any obstruction to the bladder outlet was indicated by difficulty in passing the catheter, though of course this is not an invariable criterion of obstruction. Patients with gross structural abnormality of the bladder or of its outlet were not included in the investigation. Of the 36 patients examined only 2 were thus excluded—*a leaking suprapubic fistula being present* in one case, and a complete procidentia in the other.

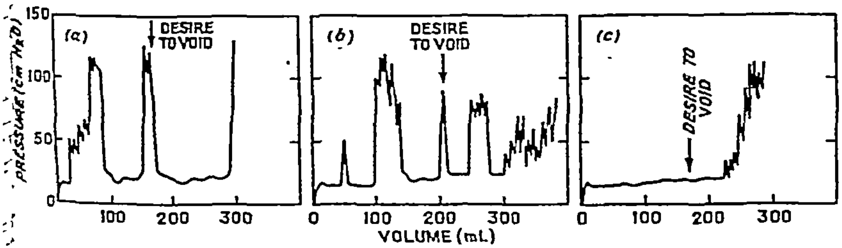

Fig. 2—Vesical pressure in a man, aged 71, who had increased frequency and precipitancy of micturition of several years' duration and was often incontinent: (a) at first cystometry; (b) a week later, showing improvement; (c) six weeks later, when symptoms had disappeared and patient said his urinary control was better than it had been for years.

RESULTS

On the entry of fluid into the bladder the pressure rose rapidly until the basic bladder tonus was reached. This reading varied from 8 to 18 cm. H_2O in different patients. Thereafter, unless bladder contractions took place, the curve of serial pressure readings ascended gradually until the instillation was discontinued.

In all the incontinent cases a point was reached at which the bladder did not accommodate further, and a sudden sharp rise in manometric pressure indicated contraction of the detrusor muscle. In spite of voluntary attempts to do so, the patients could not control the contractions, which were usually of considerable amplitude—as much as 125 cm. H_2O in some cases. These uninhibited contractions usually appeared early in filling, especially in the constantly incontinent cases, and almost invariably were not preceded by any sensation of desire to void. A typical vesical-pressure graph of such a case is shown in fig. 2*a*. Vigorous bladder contractions such as these, arising unheralded during physiological filling of the bladder, would undoubtedly *lead to involuntary emptying of the viscus.*

In the case of 3 constantly incontinent patients, however, in contrast with those already described, there was evidence of a moderate degree of adaptation of the bladder to distension, and contractions did not appear till comparatively late in filling. These patients were, however, completely confused and relatively inaccessible mentally, and it was evident in each case that the patient was not trying actively to control the bladder contraction. On the contrary, in 2 of the cases contraction of the abdominal musculature and relaxation of the perineum indicated a voluntary attempt to void. In these patients the incontinence was not a true dysfunction of the bladder mechanism, but rather a disorder of behaviour in which the patients voided urine (and often fæces) without reference to their surroundings, as the result of a dementia.

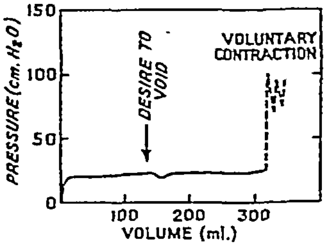

Fig. 3—Vesical pressure in a woman, aged 83, with no urinary complaint: bladder shows complete adaptation to instillation without uninhibited contractions.

Those patients in whom precipitate and overfrequent *micturition* was the main complaint, and in whom incontinence was only occasional, exhibited less bladder overactivity than did the constantly incontinent. Uninhibited contractions tended to arise later in filling, and there was occasionally prior, though admittedly short, warning of impending bladder contractions.

In patients who were free from urinary complaints the bladder either adapted completely during the instillation without contractions, or if contractions arose they were late in filling and were preceded at a considerable interval by increasing desire to void (fig. 3).

Most of the patients with precipitancy and incontinence noted an improvement in symptoms, occasionally dramatic, after cystometric examination. Frequency was less, and they had more control and could refrain from voiding for a longer time than before. In 10 of the 23 patients who complained of precipitancy or of incontinence the symptoms much improved or entirely cleared, and in 5 others some improvement was noted. Included in the 8 cases in which no improvement took place were the 3 patients whose incontinence was a disorder of behaviour rather than a dysfunction of the bladder mechanism.

Concurrently with the improvement in bladder function, cystometric evidence of increased bladder adaptation was observed. Uninhibited contractions arose later in filling than before and, where the incontinence had cleared, these contractions did not appear until an appreciable interval after the sensation of desire to void had been felt. Thus the patient had adequate warning of the state of bladder distension and could void *voluntarily before the* bladder was emptied reflexly (fig. 2).

The uninhibited contractions in some incontinent patients, more especially if the symptoms were long-standing, were poorly sustained and, though of normal amplitude, tended to subside rapidly. In these cases it was generally found that the bladder contained a consider-

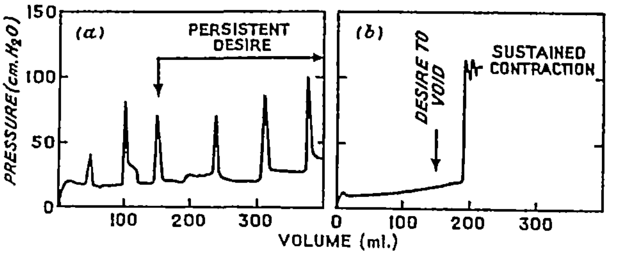

Fig. 4—Vesical pressure in a man aged 93: (a) while constantly incontinent, with residual urine 400 ml.; (b) a month later, when no longer incontinent, though micturition was still somewhat precipitate, and residual urine had decreased to 50 ml.

able quantity of residual urine. As bladder function improved with treatment, however, and overactivity was lessened, the contractions became more sustained and the quantity of residual urine decreased (fig. 4).

DISCUSSION OF RESULTS

The cause of incontinence of urine and, in a lesser degree, of precipitancy and urgency of micturition in the old people investigated was an overactivity of the reflex bladder mechanism in most cases.

A contributory factor to incontinence was, in some instances, a diminution of the visceral sensation of desire to void, with the result that the patient had little knowledge of the state of fullness of his bladder, or of the imminence of reflex voiding contractions.

In a few cases uncontrolled voiding resulted almost entirely from mental disorientation, and in only 3 cases did weakness or laxity of the vesical sphincter play an important part. In 2 of these patients there was a history of obstetric trauma, but the most patulous sphincter was detected in a nulliparous female with a hemiplegia.

Overactivity of the bladder mechanism resulted from a deterioration of the cortical inhibitory function, and from the presence of any local pathological state of the bladder of its outlet which tended to increase the excitability of the stretch receptors in the bladder wall. Of these two factors the former is the more important. In common with other cortical functions, it is not unreasonable to presume that inhibition of bladder activity participates in the general deterioration of efficiency which is a feature of senile involution within the nervous system. The actual cerebral lesion may be obscure. Neuronal atrophy, gliosis, and amorphous deposits have been described as occurring in the senile brain, and areas of softening, lacunæ of degeneration, small hæmorrhagic foci, and disseminated areas of atrophy often result from cerebral vascular disease (Critchley 1931). Commonly incontinence may be ushered in by a frank cerebral vascular lesion, often leading to hemiplegia.

Besides the deterioration of cortical inhibition resulting from structural damage to the nervous system there may also be a purely functional loss of inhibition. After a cerebral vascular lesion, injury to many of the nervous elements is transitory, and after a time recovery, or partial recovery, will ensue. Though the damage may not have been permanent, however, recovery of the function with which these elements were concerned may not take place until the patient has been re-educated in that particular function. Thus, as the recovering hemiparetic has to learn again the proper control of his limbs in walking, so, if the bladder inhibitory function has been in abeyance, control of bladder contractions must once again be acquired, as it was in infancy. Mitigating against the recovery of bladder control perhaps more than any other single factor is the semisomnolent state into which the aged patient so rapidly declines when confined to bed. In this vegetative existence the inhibitory function becomes involved in the general sluggishness of response to stimuli which is so apparent. In the present series the patients who were bedfast showed a much greater tendency to relapse after treatment.

Toxæmia and cerebral anoxæmia due to any cause, such as congestive heart-failure and severe anæmia, also tend to impair the inhibitory function, and thus lead to overactivity of the bladder.

Of the local pathological conditions a urinary infection is the most commonly detected. The incidence was high (50% of cases) and was relatively greater in females than in males. In some instances an acute urinary infection brought on precipitancy and incontinence, but in others chronic infections were found without an urinary dysfunction whatsoever. Infection was almo invariably present in the incontinent females, probabl as a result rather than the cause, of the incontinence. Urination often improved in spite of the persistence of a chronic infection. A chronic urinary infection therefore does not appear greatly to increase th excitability of the bladder reflex. If the infection i acute, however, reflex excitability is much increased. Geist and Salmon (1943) have related the urinary incontinence of some postmenopausal women to a senile vaginitis and œstrogen deficiency causing impaired tonus of the vesical sphincter. Many of the female patients in this series had a senile vaginitis, which was in some cases improved by the administration of stilbœstrol. There was improvement in urination, with less reflex bladder excitability, after œstrogen therapy in these cases, but results were not dramatic, and no change was observed in the tone of the sphincters. It i considered, however, that a senile vaginitis helps t increase the excitability of the bladder reflex.

The incidence of enlarged prostate was no greater among the incontinent patients than among the continent. The rôle of prostatic enlargement in urinary dysfunctions is discussed below.

RATIONALE OF TREATMENT OF OVERACTIVE BLADDER

Maclachlan (1863), discussing the treatment of incontinence in the aged, stated:

> "Injections of cold water, perseveringly applied, the urine being first drawn off, are said to have been successful in numerous instances."

Braithwaite (1944) has noted dramatic relief following the graduated distension of the bladder with warm boracic solution in severe diurnal frequency in children which has not responded to ordinary measures. In the present series both subjective and cystometric improvement in bladder function resulted, in many cases, from the procedures comprising cystometric examination. The reasons for this are twofold, of which the first is considered the more important:

(1) During the filling of the bladder the patient is constantly urged to inhibit contractions. If a contraction takes place,

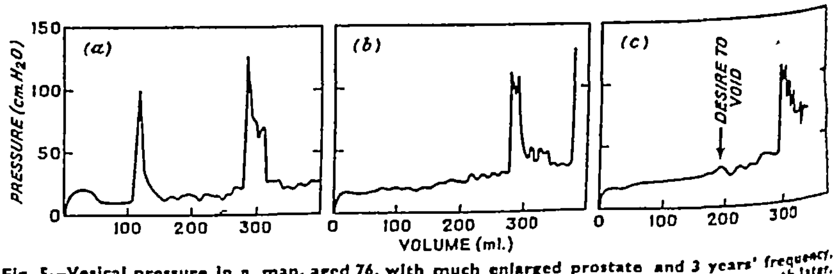

Fig. 5—Vesical pressure in a man, aged 76, with much enlarged prostate and 3 years' frequency, urgency, and incontinence, with residual urine 400 ml.: (a) at first cystometry; (b) a month later, when he had more control of micturition, though still occasionally incontinent, with residual urine 250 ml.; (c) two weeks later, when he had good control of micturition, with residual urine 80 ml.

here is no outlet for the fluid and the contraction registers is pressure on the manometer. Unless visceral sensation s much diminished, during such a contraction considerable liscomfort is felt by the patient. This discomfort can be elieved only by *inhibition of the contraction, and the patient* s thus stimulated to inhibit strongly. In this way, if the nhibitory pathways are intact, the patient is re-educated n the inhibitory function.

(2) In some instances where the bladder has been emptying eflexly in response to the addition of small amounts of urine he fibres of the bladder wall have become shortened and the ladder has become small and contracted. In these cases radual dilatation of the bladder with fluid will allow the uscles of the bladder wall to be stretched to an extent yond the normal. This will decrease the sensitivity of the retch receptors of the bladder wall, and may be regarded a parallel to the full mobilisation of a limb which has veloped a contracture. More usually, however, the inhibited contractions of the incontinent patient only rtially empty the bladder, and there is a gradual build-up increments of residual urine. This build-up is assisted y the erroneous impression so often entertained by nurses at a patient who has just been incontinent does not require bedpan or a bottle, and by the fact that the patient does not alise that his bladder has not been emptied. *It is necessary* ensure that when voiding does take place it is as complete s possible. Such patients must be encouraged to empty heir bladders voluntarily, even though they have only ecently been incontinent.

Attempts should be made to eradicate any local ondition which may cause bladder irritability. Finally, he patient should be stimulated to lead as active a nental and physical life as possible, and encouraged to ry and control bladder function.

PROSTATIC ENLARGEMENT IN RELATION TO URINARY DYSFUNCTION

Enlargement of the prostate is closely linked with urinary dysfunction in elderly males, and the term "prostatism" is commonly applied to such a syndrome in these patients. In the present series cystoscopic examination of the prostate was impossible, but some degree of obstruction was detected in as many patients without precipitancy or incontinence as it was in patients with these complaints. Where frequency and precipitancy of micturition were accompanied by enlargement of the prostate, these symptoms improved in most cases after cystometry, *and the efficiency of the urinary* mechanism increased, with reduction of residual urine (fig. 5).

In progressive enlargement of the prostate two factors come into play: (1) increasing obstruction to the vesical outlet; and (2) an increase in the irritability of the bladder. As a result of the obstruction, difficulty in initiating micturition and possibly dysuria arise, and later, if the obstruction increases, retention of urine develops. In response to the increasing obstruction, the bladder wall becomes hypertrophied and trabeculate. Increase in bladder irritability, if the cerebral inhibitory function is not impaired, gives rise to increasing frequency of desire to micturate. If, however, there is diminished cerebral control, as is so often the case in such patients, the increased bladder irritability is sufficient to cause the bladder reflex to break through the diminished cortical control, giving rise to uninhibited bladder contractions and urgent and precipitate micturition, perhaps with incontinence. As a result of the overactivity the bladder contractions are less efficient, and the amount of residual urine is increased. Thus the balance between the degree of obstruction to the vesical outlet and the efficiency of the neuromuscular mechanism of the bladder is of prime importance. In the presence of minimal prostatic obstruction large quantities of residual urine may be found as a result of inefficient bladder contractions (fig. 4).

Clarke (1937) has described cases of prostatic syndrome in which the symptoms disappeared spontaneously after cystoscopy. The amelioration of symptoms in many of these cases may have been due to improvement in vesical function following the instillation of fluid similar to that occasioned by cystometry.

In the investigation of cases of prostatic obstruction, therefore, it is considered that, besides estimating the degree of obstruction to the bladder outlet, the functional efficiency of the neuromuscular mechanism of the bladder must be assessed by cystometry, and if possible the function improved.

SUMMARY

The common urinary dysfunctions in the aged are increased frequency and precipitancy of micturition, often accompanied by incontinence.

The cause of these symptoms is mainly overactivity of the neuromuscular mechanism of the bladder. Sphincteric weakness is important in only a small minority of cases.

Overactivity of the bladder mechanism results from diminution of cortical control and from local irritative conditions of the bladder and its outlet. These factors operate to different extents in different cases but commonly the former plays the more active rôle.

Impaired cortical control may be due to structural changes within the nervous system and to a functional loss of inhibitory power. An impaired mental state is a contributory factor, as also is the confinement of the elderly patient to bed.

In many cases of overactivity of the reflex bladder mechanism function improves as a result of gradual distension of the bladder with fluid and inhibitory re-educative training.

The efficiency of the neuromuscular mechanism of the bladder is doubly important in prostatic enlargement. The routine investigation of the prostatic syndrome in the aged should include cystometry, so that the bladder function may be assessed and, if possible, improved.

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". . . Few would deny the advantage of good build, fast and accurate neuromuscular coördination, strength, physical health and a high natural resistance to disease. We can surely encourage those endowed with such qualities to regard themselves as proper parents for the next generation. But in the field of temperament, our aims are much less clear. There is no such thing as a good and desirable type of temperament, and a bad and undesirable one. It takes all sorts to make a world. There is room for the quiet, the docile and the stable; but there is room also for the man of strong passions, for the natural born rebel, for the man whose moods take him from phases of elation and enhanced activity into troughs of depression. It is true, indeed, that a man like Hitler can cause much greater harm to humanity than even a million mental defectives; but we cannot say, if Hitler had had children, that they would have been any more likely to have been bad citizens than anyone else's. It is particular combinations of temperamental qualities which are productive of large effects, good or bad. Recombined in another way, the effect of the genes responsible would have been different. In fact we are too uncertain of where we want to go, and too ignorant of the foundations on which we stand, for there to be at present a practical eugenic approach to the betterment of human personality."
—DR. J. A. FRASER ROBERTS and DR. ELIOT SLATER, *Eugenics Review*, July, 1948.

SPONTANEOUS RUPTURE OF THE RECTUM

REPORT OF A CASE

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TRAUMATIC rupture of the rectum appears to be fairly common, but not spontaneous rupture.

Lindenbaum [1] collected the records of 26 cases, including one reported in 1827 by Brodie, who apparently was the first to describe this condition. Of these 26 patients 24 died. In 23 cases rupture was associated with effort: 12 during defæcation, 4 during weight-lifting, and the remainder after a fall, while vomiting, during micturition, during childbirth, or during the return of the prolapsed rectum after purgation. In 13 cases rupture was associated with prolapse of the rectum, and in 2 with cancer. In 8 cases no pathological abnormality was found. Guibé [2] describes 1 case in which the rectum was ruptured during sleep.

The following case appears to be one of the rare spontaneous ruptures not associated with strain or any pathologic abnormality.

A male photographic process operator, aged 54, felt a sudden moderately severe pain in the lower part of his abdomen while walking to work after his midday meal.

The pain, at first felt chiefly in the hypogastrium, gradually spread over the whole abdomen, but he continued with his work until 4.15 P.M., when he was obliged to return home because of the severity of the pain. In response to a "feeling of fullness in the back passage" and a sensation that "something wanted to come away" he took a dose of Glauber's salt, which he immediately vomited.

He reached hospital via his doctor just before midnight and gave a history of many years' chronic constipation, but had for about six weeks not found it necessary to take purgatives. There was *no history of passing blood or mucus*; his bowels were opened naturally early that morning, and enemas were never used.

Examination revealed generalised abdominal rigidity and absence of abdominal breathing, with tenderness more acute in the right inguinal fossa and in the right epigastrium. Liver dullness and bowel sounds were absent. Rectal palpation revealed a walnut-sized swelling in the pouch of Douglas, with tenderness more acute on the left side. Anus of good tone and not patulous. Slight cough, and a few râles at both lung bases. Blood-pressure 160/80. Temperature 101·6°F, respiration 22 per min., pulse-rate 78.

Laparotomy.—About eleven hours after onset of symptoms his abdomen was opened through a right paramedian infra-umbilical incision. Peritoneal cavity contained purulent fluid. Appendix normal.

A mass of fæces about 1 in. in diameter and of the consistence of fresh putty was lying free in the pelvis, and a transverse tear 1½ in. long was found in the anterior wall of the first part of the rectum.

The slit in the mucosa was not indurated or friable, and there was no hæmorrhage. Rectum and pelvic colon otherwise normal. *No evidence of foreign body. Small intestine* had not prolapsed through tear.

Tear was sutured in two layers, and a suprapubic pelvic drain inserted. Operation completed by left inguinal colostomy.

Progress.—Postoperative treatment included sulphadiazine and penicillin. Patient made an uninterrupted recovery. Three months later colostomy was closed by intraperitoneal method.

I wish to thank Mr. Neil Sinclair, senior surgeon to King George Hospital, Ilford, for permission to publish this case.

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[1] Lindenbaum, I. S. *Arch. klin. Chir.* 1936, 187, 478.

[2] Guibé, M. *J. Chir., Paris,* 1931, 37, 645.

CONGENITAL TORTICOLLIS IN IDENTICAL TWINS

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THERE are many records of the same abnormality in identical twins, but none of torticollis.

The following two cases of torticollis were in identical twins born on July 5, 1935. Unfortunately no details of their obstetric history can be obtained, since they were born in a nursing-home which has since been closed, and their mother died three months after their birth. The aunt, who looks after them, does not know of any abnormality during labour. There is no history of torticollis or of hereditary disease in any other member of the family; and, apart from the fact that one child has strabismus, they had no other congenital abnormalities. The twins are otherwise healthy and normal.

They were admitted to the Redhill County Hospital on March 10, 1947, with an identical well-marked right torticollis. In both cases the clavicular head of the sternomastoid muscle was more contracted than the sternal head, and there was a small bony swelling at the insertion of the muscle into the clavicle. There was no sternomastoid "tumour." There was obvious right facial hemiatrophy and an early scoliosis of the upper dorsal and lower cervical spine. The physical defect was the same in the two cases.

As both twins had an eye defect, the question of ocular torticollis was considered, though they did not show all the features of this disease. They were therefore referred to Mr. G. J. Ahern, county ophthalmologist, who reported as follows:

"Twin no. 1 had a left convergent concomitant squint of 15°. There was no suggestion of a vertical deviation which goes with an ocular torticollis. I consider she has a straightforward left convergent concomitant squint due to difference in the refraction of the two eyes, and that her torticollis is incidental.

"There is no evidence of strabismus in twin no. 2. Her visual acuity is subnormal. There is nothing very strikingly similar in their eye defect. Lastly, the only similarity is in twin no. 1's left eye and twin no. 2's right; and, if this was playing any part in their torticollis, one would expect the head tilt on opposite sides."

At operation on March 11, the sternomastoid muscle and deep fascia were divided, after which the twins made a satisfactory recovery. When they were last seen on Aug. 18, neck movements were normal.

Many causes of congenital torticollis have been suggested, including heredity, ischæmia, and trauma. Mercer [1] states that trauma is generally held to be the primary cause. McMurray [2] gives the theory that the contracture of the sternomastoid is similar to that occurring in Volkmann's ischæmic contracture and is due to thrombosis of the end-artery which supplies the middle part of the sternomastoid muscle. There is no record of a sternomastoid swelling in these twins, and it must be assumed that the torticollis is congenital. Illingworth and Dick [3] consider that there is no single cause of congenital torticollis; that some cases must be attributed to developmental aplasia of the affected cervical segments; and that this is the usual cause. In these twins a traumatic origin can be virtually excluded, for it is most unlikely that they suffered precisely similar trauma. A congenital developmental error is the probable explanation.

I have to thank Mr. Norman Pitt, medical superintendent of Redhill County Hospital, for his interest and encouragement; and Mr. Ahern for his report on the eye condition.

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Preliminary Communication

EXSANGUINO-TRANSFUSION IN ACUTE LEUKÆMIA

It is, of course, still true that no method of treatment will cure acute leukæmia, but that is no reason for complete inactivity on the part of the physician, because in many—perhaps most—cases, it is possible to induce a remission. Since nothing is known of the cause of leukæmia in man, treatment must necessarily be empirical; nevertheless, one's views on the cause of the disease may influence the choice of treatment. Those who hold that the leukæmic process is neoplastic will tend to favour radiotherapy, though in acute leukæmia it is worse than useless. If, on the analogy of avian leucoses, the disease is regarded as infective, the temptation is to try the various antibiotics. But holders of either of these theories are, not unnaturally, inclined to therapeutic nihilism, because there is no effective treatment for generalised malignant tumours or for the virus diseases.

On the whole, the consensus is in favour of the neoplastic theory, perhaps mainly because the cellular characters are reminiscent of those characteristic of malignancy. That is true enough, but similar cytological appearances are found in the immature red cells in pernicious anæmia, which is not neoplastic, though about 30 years ago there was a tendency among pathologists to think that it was.

Few, if any, writers have suggested that the cellular changes are secondary to abnormalities of the milieu interne—in other words, that the dedifferentiation or undifferentiation of the leukæmic cells follows changes in the blood-plasma. That this is a possibility is suggested by the observation of Schwind,[1] that injection of normal blood-plasma leads to diminution in the number of myeloblasts in the blood, which seems to indicate that the pathological process in the hæmopoietic tissues is not entirely autonomous. Then again, Israëls[2] found that, in tissue culture, leukæmic myeloblasts could mature into myelocytes—a clear indication that they are not totally disordered, but that their abnormalities depend on their environment. Another significant point is that Dreyfus,[3] after a careful and extensive study of the literature of remissions in acute leukæmia, has shown that there is a direct relation between the likelihood of a remission and the number of blood-transfusions and the total amount of blood infused.

Then came the remarkable reports of Bessis and Bernard,[4] who performed a replacement transfusion in a case of acute leukæmia and produced an immediate remission. Occasional injections of 100 ml. of blood, together with penicillin whenever sepsis occurred, prolonged the remission for months. I had the opportunity of seeing such a case in Paris. A man of 40 developed a remission of acute leukæmia after an exsanguino-transfusion and nine months later is still in fair health, though it has been necessary to give about 100 ml. of blood every fortnight and also short courses of urethane when the leucocytes rise unduly high. As Bessis will publish details of this case I cannot give more information about it, but I wish to call attention to some of the remarkable changes that followed replacement transfusion in the following case of acute leukæmia.

A woman, aged 34, had been diagnosed as suffering from acute leukæmia about two months before I saw her, and had been given about 4 pints of blood. Then, because it is impossible to obtain very large quantities of blood at any one time in England (a matter I hope to discuss in another article), the patient was taken to Paris, where Tzanck performed exsanguino-transfusion in two parts, with an interval of two days between.

The hæmogram, when the patient left London, was:

Red cells	2,600,000 per c.mm.
Hæmoglobin	45 %
Leucocytes	96,000 per c.mm.
Platelets	very scanty indeed.
Polymorphs	12 %
Lymphocytes	1 %
"Blasts" of monocytoid type	87 %

The day after she had been transfused with 7 litres of blood, while 6½ litres was withdrawn, her hæmogram was:

Red cells	4,500,000 per c.mm.
Hæmoglobin	90 %
Leucocytes	18,400 per c.mm.
Platelets	236,000 per c.mm.
Polymorphs	18 %
Eosinophils	2 %
Basophils	1 %
Metamyelocytes	14 %
Myelocytes	5 %
"Blasts"	58 %
Lymphocytes	2 %

Twenty-four hours after a further 7 litres had been infused and the same amount withdrawn, the hæmogram was much the same, except that the leucocytes had fallen to 12,000 per c.mm., while the red cells showed a good deal of anisocytosis and polychromasia. Five days later the blood picture was practically unchanged; and the patient, who had been extremely ill, was feeling well; she was afebrile and had lost the exquisite tenderness of the sternum that had been very striking when I first saw her. The spleen, which had been palpable (about two fingers), was unchanged.

There is, of course, no way of determining how long the remission will persist in this case, but one can hope that, using Bessis's technique (frequent "topping up" with small blood-transfusions, and urethane) it may be possible to prolong it, perhaps until the disease passes into the chronic form.

The aspect of the matter that seems to me to be of such great importance is that such exsanguino-transfusions bring about a distinct change in the cellular composition of the blood and hæmopoietic organs, which is not simply attributable to the blood that has been infused but is a vital reaction on the part of the patient. Whether, in the leukæmias, the plasma is deficient in some substance required for the maturation of white cells, or whether it contains some substance that stimulates them to divide so rapidly that maturation is impossible, I do not know. But that there is here a possibly fruitful line of research seems to be obvious.

Two striking points have already emerged. First, it is notorious that massive transfusions are badly tolerated in acute leukæmia, whereas exsanguino-transfusions cause only a minimal upset: urticaria and a few small rigors are not uncommon after about 5–6 pints has been drawn off and the same amount infused. Secondly, the published cases show that the remissions are not purely symptomatic, for both blood and marrow revert to a much more normal composition; and the remission is progressive, improvement occurring steadily for days or weeks—it is not a case of living on borrowed blood.

It is much too early to theorise about the mode of action of exsanguino-transfusion, but of its value there can be no doubt. One patient so treated has lived in good health for over 20 months (to be published by R. Cattan). To the hæmatologist, one of the most remarkable facts is that a relapse may be heralded by a sudden neutrophilia, and not, as one would have expected, by an increase of "blasts."

A. PINEY
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Physician.

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and Children, London.

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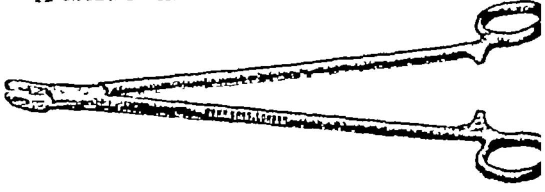
New Inventions

A MATCHED SET OF NEEDLE-HOLDERS



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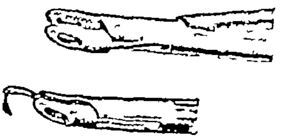

Fig. 2—Tip of needle-holder giving specially reliable grip.

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Harold Dodd, F.R.C.

London.

THE LANCET

LONDON: SATURDAY, SEPT. 4, 1948

Food and Peoples

"IF we cannot solve the problem of world resources this century, we are heading for the greatest tastrophe in history." Sir JOHN ORR's blunt rning, at the Congress on Population and World sources in Relation to the Family, held at Chelnham last week and reported on p. 388, was delivered apt hearers. The congress was arranged by the mily Planning Association of Great Britain, and tended by delegates from an extremely wide range countries. Discussion throughout four days centred und the twin problems of a growing world population d the difficulties which must be faced if they are be fed. The situation can be approached in two ys—either we must plan to increase food production ormously and to solve the outstanding puzzles of tribution; or we must find ways to stabilise pulations. Probably we shall only just avoid saster if we use both methods intelligently and with l our might. Sir JOHN ORR and his colleagues on e Food and Agriculture Organisation inevitably ncentrate on the first, while family planners look ith confidence to the second as a long-term policy fering some hope of world salvation.

The possibilities of greater food production are cidedly promising if they can be put into effect. y better methods of agriculture and better plant lection, by cultivating more ground, and by reclaimng ground now being destroyed by soil erosion, the ield can be much augmented. All this will be wasted fort, however, if distribution is not made more quitable. To produce *enough* food is merely a piece f virtuosity if a few nations are to eat well above ubsistence level while others live far below it. For time at least we may have to be content with a impler diet—on the lines, perhaps of Mr. ROY ALKER's diet of brown bread, milk, and vegetables—f we are all to eat at all. Other experiments are eginning to promise results: the cultivation of plants in water to which the necessary chemicals have been dded, and the chemical synthesis of foodstuffs were mentioned at the congress. None can say how far such methods can be developed, or how men a few centuries hence will be feeding themselves. But unless some unforeseen and revolutionary changes take place we must double our food production within the next 25 years if we are to feed the 3000 million people who will be alive at the end of the century: otherwise the hungry generations will tread us (and each other) down in quite a new sense from that which troubled KEATS. As Sir JOHN ORR pointed out, hungry people do not die quietly; and why should they?

The food issue, however, is fairly straightforward, while that of population is tortuous. Dr. C. P. BLACKER's five stages in the demographic cycle seem to promise an ultimate stability, or even decline, in the world population; but the trouble is that national populations are at different stages in the cycle. Thus France has already passed the fourth stage (in which there is a low birth-rate and death-rate, and a stationary level of reproduction) and is passing into the fifth stage of decline. Great Britain and the United States are likely to follow suit. The U.S.S.R. is in the third stage, in which the birth-rate is falling but the death-rate falling faster; while large parts of Asia and Africa are in the first stage (with a high death-rate and a high birth-rate), or the second stage (with a high birth-rate and a falling death-rate). The danger is that if population growth is left to develop on its own lines the hungry, fertile, and overcrowded nations will in the end be driven to go to war with those which are stable and well fed. Migration, it seems, is no solution. In the long run it will be to the advantage of nations in the later demographic stages to help the rest to eat and live better, for it is a constant demographic observation that the birth-rate falls when standards of living rise. Nor is this the fate of man alone: animals and insects are similarly affected. Thus populations of butterflies living under adverse conditions are commonly very fertile: whereas they reproduce much less freely when conditions improve. It is as though when conditions are bad nature ensures race survival by providing a surplus; when conditions are good she can afford to be more parsimonious. Certainly birth-control alone is not responsible for the population change which follows in the train of better standards of living. What other factors come into play are a matter of speculation, and were not discussed at the congress. One may be the later marriage common in communities where young people find it worth while to work and save in order to launch themselves more comfortably. Another may be, as Mr. F. M. MANSOUR suggested, that a large family is a constant source of occupation and pleasure to those who have few other interests; whereas in a community offering a wider range of interests, especially to women, the family no longer holds undisputed place. Again, it is not often possible in the crowded homes of an industrial town to raise a large family: some means of restriction has to be found. None of these arguments, however, applies to butterflies—or indeed to any other animal than man—and there may well be biological factors at work on the germ plasm of which we know nothing. How much effect contraceptives have on the size of populations is hard to determine; possibly their main value is to the individual. Spacing of children benefits both mother and children, protecting the lives and health of both: and it is noteworthy that in the United States, as Dr. ABRAHAM STONE pointed out, all Churches agree that such planning adds to the stability of the family, though some Churches consider observance of the "safe" period to be the only justifiable contraceptive measure.

Whether the dissemination of contraceptive technique in countries now in the first two demographic stages would help to stabilise populations and prevent "swarming" requires close and quick study. At all events it is worth trying. Unfortunately it presents special technical problems, since most of these countries are in tropical or subtropical latitudes. Most contraceptive appliances are of rubber, which perishes easily in heat, and most chemical contraceptives are made up in bases designed to melt at body temperature. It seems likely, from the reports of speakers at

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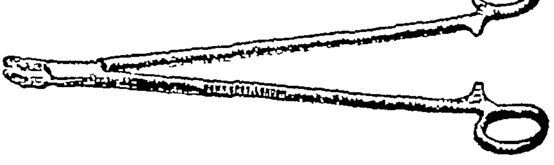

Fig. 1—One of the set of four needle-holders.

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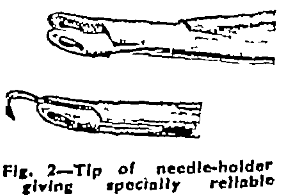

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Medullary Nailing

DURING the second half of the late war orthopædic geons in Britain and Western Europe began to counter, among prisoners repatriated from Germany, ctures which had been treated by inserting a el nail throughout the length of the marrow cavity. is method, originally described by KÜNTSCHER the Vienna Surgical Congress of 1940, had been eived in Germany with early coldness and later thusiasm, and the published reports on it had been ted here with some scepticism,[1] but it was then en to be a practical success. Now that the best rt of a decade has elapsed. intramedullary nailing routine in many German centres, where it would unusual not to treat a fresh fracture in this way. e latest edition of BOEHLER's famous textbook[2] cludes a special volume on the applications of the chnique. The textbooks of SOEUR[3] and ROCHER[4] itness its adoption in Belgium and France, and ESTERBORN[5] has described results obtained in andinavia. But in Britain and the U.S.A. surgeons e still slow to accept it, and little more than an casional case-report is to be found in the journals. is not as if the principle of axial control were new. he intramedullary bone peg is an old—and usually efficient—friend; LAMBOTTE,[6] before the first orld war, experimented with the clavicle and other ones, as later did that versatile surgeon HEY GROVES. ore recently, LAMBRINUDI[7] used central Kirschner ires for stabilising difficult fractures of the forearm ones. The issues may be stated somewhat as follows.

In post-war Europe, with its shortage of hospital eds and materials and lack of skilled aftercare and hemotherapy, the advent of the Küntscher nail was normously advantageous. Patients could be sent ome after a week or two, usually without plaster plintage, and often returned to light work after a month. Physiotherapy was unnecessary when, for ractical purposes, the fracture had been abolished t the outset of treatment. Of BOEHLER's three amous tenets of absolute reduction, absolute fixation, and maximum function, it was for the surgeon o achieve the first, and the insertion of the right-size nail provided the second and permitted the last. In Britain and America a different situation, with a sufficiency of penicillin and good-quality metal appliances for internal fixation, accounted for the hesitant attitude towards the new method. When open reduction was necessary, vitallium plates and screws of known performance were used. Deliberate leisurely open bone operations, protected by chemotherapy and transfusion on the scale the war had made possible, still seemed promising enough to make surgeons reluctant to contemplate quite a different technique. But plates and screws have their disadvantages. They impose mechanical conditions at the fracture site with which the osteoblasts must comply or the technique will fail; and they may nullify the longitudinal compression forces essential to sound union. Hence the various stratagems—the coaptors of DANIS,[8] and the slotted plates of EGGERS[9]—designed to allow the biological element in union full play. The Küntscher nail, on the other hand, is an axial rod on which the bone fragments are threaded and which converts all the forces of weight-bearing and muscle spasm into longitudinal compression at the fracture gap.

The technique and its applications vary in different hands. Where KÜNTSCHER and his colleagues would use the nail for almost every closed fracture in adults, others reserve it for difficult cases. On p. 387 in this issue Mr. FRAENKEL describes the standard methods used at Schleswig and Kiel, where a "closed" technique is usual, the fracture being reduced by traction and the nail inserted through a stab over one end of the bone under fluoroscopic control. KÜNTSCHER himself never exposes the fracture, abhorring the periosteal reflexion and fall in local pH which set back healing; and if closed methods fail he resorts to old-fashioned traction or plaster. Other surgeons do not hesitate to perform open reduction and to introduce the nail at the fracture level by a retrograde method. At some clinics no external splintage is used, whereas at others a plaster cast gives the surgeon a good night's rest.

The clinical, functional, and economic advantages of nailing are so obvious that we may reasonably pay particular attention to its disadvantages and to the minority of failures. As MCFARLAND[10] has said—and it cannot be repeated too often—"the fracture patient should be at least no worse off after treatment than if left alone; he should be positively better treated than untreated; operation should leave him in a better state than non-operative treatment; and the added risk of operation—a real one—should be commensurate with the added benefit." The sepsis-rate in the great mass of German nailing operations is somewhere in the region of 5%,[11] a figure which, while acknowledging our own imperfections, we must regard as 5% too high. But against this, those who nail regularly regard infection as a nuisance but not a menace. It does not lead to a general osteomyelitis, and the nail must *not* be removed, for its splinting action is now doubly important and it drains the pus to the surface at the site of introduction, where simple drainage of the soft parts may be all that is needed. Fat-embolism seems to be mainly a theoretical danger, except perhaps in the femur; SOEUR records only one case where it possibly occurred. Does the nail hinder callus formation? Apparently not; in KÜNTSCHER's famous animal experiment, the insertion of a nail into an intact bone provoked ensheathing callus formation in the absence of any fracture. The question of X-ray control is a major one. The free use of screening makes nailing a rapid and trivial operation, but the hazards are too serious to be ignored. As SOEUR advises, it should be abandoned in favour of repeated radiography as for the insertion of a Smith-Petersen pin, a deliberate, often tedious, and major operation. It is obvious. too. that there

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1. *Bull. War Med.* 1943, 4. 16; 1944, 4, 333.
2. Boehler, L. Technik der Knochenbruchbehandlung im Frieden und im Kriege Vienna, 1944.
3. Soeur, R. L'ostéosynthèse au clou. Brussels, 1946.
4. Rocher, C. L'enclouage medullaire. Paris, 1945.
5. Westerborn, A. *Ann. Surg.* 1948, 127, 577.
6. Lambotte, A. Chirurgie opératoire des fractures. Paris, 1913.
7. Lambrinudi, C. *Proc. R. Soc. Med.* 1940 33, 153.
8. Danis, R. At 12th Congress of the International Society of Surgery. *Lancet*, 1947, ii, 520.
9. Eggers, G. W. N. *J. Bone Jt Surg.* 1948, 30A, 40.
10. McFarland, B. At B.M.A. Annual Meeting, section of orthopædics. *Lancet*, July 10, p. 68.
11. Le Vay, A. D. At B.M.A. Annual Meeting, section of orthopædics. *Brit. med. J.* July 17, p. 158.

the congress, that the women in these countries would welcome advice on the spacing of children ; and there is little danger that the spread of such advice would lead to race suicide since fertility is very highly valued in such countries. Yet until an appropriate and accessible contraceptive can be devised for hot climates, such advice cannot be an effective measure for population control. In the task of solving this and other problems of fertility the new international committee for research into family planning, set up at the congress, will have an important part to play. In the long run, however, the best means of reducing the birth-rate may be to raise world standards of living—a policy worth achieving on many grounds. We are constantly getting opportunities to look ahead and plan our destiny, though we generally ignore them. This seems to be a situation in which duty and interest point the same way—towards an effective world plan for food and a rise in living standards. As the Rev. Joseph McCulloch put it, *man is born to know more and more what he is doing. His survival may well depend on his ability to accept this privilege and responsibility.*

Function and Dysfunction of the Bladder

The normal function of the bladder has received too little attention from the clinician. This viscus is unique in that, though its activity depends on an autonomic reflex, during life a considerable degree of voluntary control is acquired. Perhaps for this reason, the factors affecting bladder function are many and varied—and as yet imperfectly understood. The mechanism of micturition has been clarified to a considerable extent by the physiologists. It is generally agreed that the activity of the bladder depends on a reflex arc, both arms of which lie in the pelvic parasympathetic nerves, and which is completed in the 2nd, 3rd, and 4th sacral segments of the cord. The exciting stimulus is provided by distension of the bladder. In addition, an overriding cortical control of bladder activity is exercised by inhibitory impulses relayed from the higher centres to the sacral region by spinal pathways. The site of impact of these impulses is thought by Denny-Brown and Robertson[1] to be on outgoing neurones of the spinal cord, and they in some way interfere with the completion of the reflex arc. Thus a person may have a sensation of bladder distension, but the viscus will not normally contract until inhibition is voluntarily removed. Desire to void urine depends on bladder distension and also on the rate of distension ; the more rapidly the bladder is filled the earlier the desire appears. But a strong and urgent desire to void also arises during bladder contractions : hence the micturition accompanying bowel opening and hence the desire to void brought on by the psychical stimulus of hearing running water. Intravesical pressure, which is the sum of the pressure exerted by the tonicity of the bladder wall and the intra-abdominal pressure, may vary independently of bladder-distension. Thus in laughing the intravesical pressure rises but the distension remains the same, and desire to void will not be brought on unless the intravesical pressure was already so high, or the urethral sphincter so weak, that the internal sphincter is forced and the bladder reflexes are brought into play. The effect such forcing of the internal sphincter probably ca for the common urgent call to micturate on getting in the morning. Emotional stress presumably by stimulating bladder contractions.

Bladder dysfunction, particularly that resu from neurological disorders, has been studied ex sively, especially in America, by means of cystome a method first practised by Mosso and Pellacani 1882. This technique is an attempt to parallel th physiological filling of the bladder by slowly instilli fluid through a catheter and noting the fluctuations intravesical pressure as registered by a manomet A reaction to distension denoting involvement those parts of the nervous system concerned wi bladder function may be one of the earliest signs a developing neurological lesion. Lesions of the pel parasympathetic nerves involving the vesical ref arc affect the motor activity of the bladd McLellan[2] has noted significant differences, whi he cannot fully explain, in the bladder chang resulting from lesions involving the posterior nerv roots, as in tabes, and those involving both arms the reflex arc, such as destruction of the sacral cor In both cases sensations and reflex activity are lo but in the former the bladder is characterised by lar capacity and lack of tone, whereas in the latter it i small and hypertonic. Owing to the close appo of the afferent and efferent spinal pathways conce with bladder function both are commonly involve in the same lesion. For this reason disturbances bladder sensations and impairment of cortical inhibi tory control are frequent concomitants. The are of the cortex concerned with bladder function has not been accurately defined, though according Fulton[3] bilateral cortical lesions involving parts areas 4 and 6, lying in the medial surface of th hemisphere, cause loss of volitional control on bladder reflexes, with urinary incontinence. Th normal volitional act of micturition is said to depe on integration emanating from the hypothalamic are as well as from the cerebral cortex. Thus, lesions the hypothalamus cause a failure of coördinati between the reflexes concerned with micturition.

The urinary incontinence which is one of the mo constant and most distressing dysfunctions of t aged is discussed on another page by Dr. Wilso In his view it is an effect of neuromuscular overactivit Local conditions increasing the irritability of t bladder and its outlet are partly responsible for th overactivity, but impairment of cortical contr whether or not accompanied by demonstrable orga lesions, is the main factor. Wilson urges the impo tance of the semisomnolent state into which ag patients commonly decline when kept in bed, th inhibitory function becoming involved in the gene sluggishness. Apart from the treatment of infectio of bladder or vagina, Wilson treats these patie by re-educating their inhibitory function and enco aging them to lead an active mental and physical li The probable effect on bladder function is yet anoth argument against allowing old people to beco bed-ridden before they must.

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[1] Denny-Brown, D., Robertson, E. G. *Brain*, 1933, 56, 149.

[2] McLellan, F. C. The Neurogenic Bladder. Springfield, 1939

[3] Fulton, J. F. The Physiology of the Nervous System. Lond 1943.

eclude special payments, if the executive council elieves them necessary for an equitable income, or erhaps to secure a candidate better suited to local quirements. Possibly, however, this might come under e next suggested category, where a vacancy is to be dvertised for an area which in the past has always tracted too few doctors. The third situation quoted is e where a doctor might be unable to manage on the me he expects to receive under the new service. may be the plight of many a rural practitioner, se practice, while no less arduous, is numerically ller than that of his urban colleague. Wherever, too, executive council considers that an extra doctor is led, for geographical or other reasons, in a small munity, it seems only fair for them to consider ial payments not only for the extra doctor but also any neighbouring practitioner whose income might seriously prejudiced through the introduction of a comer. Lastly, it is suggested that special considera- might be given to the practitioner with an abnormal ber of aged and chronic sick on his list, or in the allel case of a vacancy in an area where large numbers such people reside. Presumably this would refer to s and similar places in which invalids tend to settle, to towns from which, at times of industrial depres- , a high proportion of the younger people have ved.

hese suggestions do not preclude executive councils m putting forward other cases in which they think ucement payments should be made, though the nistry hopes that, wherever possible, minor hardships or ficulties may be met through the annual fixed payment £300 allowed under regulations, thus avoiding a ltiplicity of claims on the inducement fund. All oposals from executive councils "will be referred by e Minister to the Medical Practices Committee for vice on the payments to be made in individual cases ithin the total sum available for distribution for ducement payments." Each year the executive council, consultation with the local medical committee, will view all payments approved by the Minister and report the need for their continuance. Hardship will some- mes not be evident at once; in fact, it may not become vious, even to the doctor himself, until the numbers patients on practitioners' lists have been agreed and e first quarterly payments made. But it should not difficult, if authority allows, for the Medical Practices ommittee to sanction immediate interim payments to e more obviously needful, while keeping enough in serve to make retrospective payment to doctors whose eeds declare themselves later.

HISTAMINE FOR MIGRAINE

BOTH histamine and anti-histamine drugs have been ecommended in the treatment of migraine. Butler and omas[1] were enthusiastic advocates of the former, ich they administered intravenously by a rather borate technique. Cautious-minded readers of their iginal papers may have been impressed more with the ress of the régime than with the benefits accruing m it. Histamine has been used in migraine at the yo Clinic since 1937, and Macy and Horton[2] have ely assessed their results, carefully excluding instances what they term "histaminic cephalalgia."[3] The cases migraine, numbering 144, were divided into two ups: (1) 124 treated with histamine only, whether bcutaneously, intravenously, or both; and (2) 20 ated by the original Butler-Thomas technique, with ravenous injection of a 1 : 500,000 solution of histamine se, coupled with epinephrine and ascorbic acid. It proved difficult to judge the efficacy of the drug. Macy and Horton rightly remark that migrainous subjects are particularly liable to headache of other types, which will lower the threshold for an actual attack of migraine; but they believe that confusion from this cause is avoidable. They found that in 23–33% of cases the syndrome was unchanged by histamine, irrespective of the route of administration. About 60% showed significant improvement, which was apparently most pronounced with combined subcutaneous and intravenous injections. But of 88 patients whose condition was improved, 85 had a recurrence when the histamine was reduced or discontinued. The authors cautiously conclude that "histamine may prevent some attacks of migraine in some cases." In their opinion histamine, though neither a specific nor a truly curative agent, will continue to have a place among the prophylactic measures against migraine.

INFECTION BY TRAIN

THE pollution of railway tracks by excreta from train closets has not yet received as much attention in this country as it has in the United States, where the joint committee on railway sanitation set up by the Association of American Railroads has recently sponsored a great deal of careful research with the coöperation of the United States Public Health Service and the epidemiological department of the Johns Hopkins school of hygiene and public health at Baltimore. The results of these inquiries have been published in a series of special reports, of which the most interesting is that by Maxcy,[1] who made an exhaustive survey designed to find out how far polluted railway tracks were a cause of the spread of disease and in particular of enteric fever. After a special study of exposure to this source of infection through residence in proximity to railway tracks, employment on such tracks, or the consumption of water-supplies which might be polluted by railways at some point in collection and distribution, he could not establish the existence of a danger to public health from the method of disposal of fæcal wastes employed by railways. The further studies, summarised by Wolman and Clark,[2] are mainly quantitative, being based on observation of the toilet habits of 2000 persons travelling 320,000 miles by train during 6261 passenger hours. Excreta from these persons were collected in sealed containers carried underneath the coaches, and it was found, for instance, that along the 226 miles between New York and Washington about 0·694 lb. (dry weight) of sewage solids were being deposited per yard of track per year.

The construction of the closets in British trains and the habits of the passengers using them are probably sufficiently similar for the American results to be roughly applicable over here. As Mr. Chapman Pincher[3] pointed out last year, the potential dangers of current railway practice are obvious, but hitherto in Great Britain, as in the U.S.A. there has been hardly any evidence of the spread of disease by this means. Pincher suggested that poliomyelitis was being spread in this way, but among the many accounts of the large number of local outbreaks which made up last year's epidemic only one[4] has mentioned the residence of cases in proximity to main-line railway tracks. However, in this particular outbreak, in a London borough, the distribution of cases was very striking. The main line carrying ships' passengers from Tilbury Docks to St. Pancras station passes through Tottenham on a high and exposed embankment, whereas thereafter it runs through Islington in a cutting. At Tottenham,

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Butler, S., Thomas, W. A. *J. Amer. med. Ass.* 1945, 128, 173; *Amer. J. Med.* 1946, 1, 39; *Bull N.Y. Acad. Med.* 1946, 22, 125.
Macy, D. jun., Horton, B. T. *J. Amer. med. Ass.* 1948, 137, 1110.
Horton, B. T., MacLean, A. R., Craig, W. M. *Proc. Mayo Clin.* 1939,

[1] Maxcy, K. E. Technical Report no. 2, Joint Committee on Railway Sanitation of the Association of American Railroads New York, 1946.

[2] Wolman, A., Clark, L. K. *Amer. J. publ. Hlth*, 1948, 38, 652.

[3] *Lancet*, 1947, ii, 370.

[4] Broadbent, B. *Med. Offr*, 1948, 79, 274.

is no place for the occasional nailer, any more than there is for the occasional surgeon in any field, and the new method should be tried only at the large fracture centres in this country. It is being so tried, and the first reports will be awaited with interest. Finally, the purely orthopædic applications of the intramedullary nail must not be forgotten, for in arthrodeses, osteotomies, and bone-lengthening and bone-shortening procedures of all kinds, KÜNTSCHER has shown that it has a place of great value. Here is a field for experiment open to every orthopædic surgeon.

Annotations

PENICILLIN IONISATION THERAPY

LOCALISED infections of surface tissues are now commonly treated by simple topical applications of penicillin; but the not-infrequent failure of this method has caused the depth of penetration and degree of absorption to be questioned, and Sophian[1] has shown experimentally that tissue penetration is very superficial and absorption slight. Iontophoresis has been used in the hope of overcoming these difficulties but there have been conflicting reports on its effectiveness, and Hamilton-Paterson[2] has obtained results which seemed to show that penicillin salts are poor conductors or non-conductors of the electric current. Moreover, Popkin[3] was unable to demonstrate penicillin in the blood of patients treated by penicillin applied to the skin by iontophoresis.

Recently, Pereyra[4] has compared the specific-conductivity curves of penicillin G and crude sodium-penicillin extract with those of 'Mecholyl' (acetyl-β-methylcholine) and sodium salicylate, both commonly used in iontophoretic treatment, and with sodium chloride, a highly ionising inorganic salt. The crude penicillin was a better electrical conductor than stock sodium penicillin G, and when used in the right concentration was little inferior in this respect to mecholyl chloride or sodium salicylate. Thus, Hamilton-Paterson's inability to demonstrate conduction in his experiments may have been due to the low concentrations of penicillin employed—namely, 25–50 units per ml. Pereyra points out that 8000 units per ml. of sodium penicillin G or 5000 units per ml. of crude sodium-penicillin extract gives a penicillin concentration of 0·5%—a strength at which satisfactory results are obtained from mecholyl chloride and sodium salicylate. This concentration of penicillin is well tolerated by the skin and mucous membranes; and Pereyra found that the application of solutions in a glass chamber was more effective than by the more usual gauze-pad technique.

Absorption with iontophoresis was compared with that from ointments rubbed into the skin of the antecubital area for 15 minutes. Blood was withdrawn from the vein of the opposite arm at intervals up to an hour after treatment, and urine was collected for 2 hours. After neither innunction nor iontophoresis could penicillin be detected in the blood; in the urine, however, penicillin appeared within 15 minutes of iontophoresis. The presence of this urinary penicillin was found to depend on the application of the negative electrode only to the solution; it was estimated that the skin transference of penicillin was at the rate of about 1 unit per sq. cm. of skin per minute. The alkalinisation of the solution by the current, using 5 milliamperes for 15 minutes, caused no appreciable destruction of penicillin. To limit this alkaline shift, only distilled water should be e for dissolving the penicillin.

The application of penicillin by iontophoresis offers definite advantages over parenteral and topical administration in the treatment of locali surface tissue infections; the concentrations of p achieved at the site of application much exceed th possible by the parenteral route. This has been by Pereyra and Landy[5] who showed that penicil when administered parenterally fails to heal chancr ulcers, but when applied locally by iontophoresis p duces prompt remission; and a similar finding been made by Pereyra in a series of 13 cases.

INDUCEMENT FUND

EXECUTIVE councils have lately been seeking the vie of local medical committees on the adequacy of gene medical services in their areas. Account is being tak of the numbers of the population (including, natural those who have elected to seek medical advice private and of the doctors engaged in general practice as prin pals or as assistants, together with any local social topographical features which might make the provi of a medical service more than ordinarily difficult.

Presumably the next step will be to try to attr extra doctors to those areas found to be under-provide In areas where doctors' lists approach or exceed t permitted maxima, they have the choice of curtaili the acceptance of new patients or of arranging for adi tional assistance. In such an area a newcomer sho find an immediate and growing income, which could enhanced at first, if need be, by acceptance of the ann fixed payment. A greater difficulty, until the hou shortage has eased and health-centre building becom possible, may well be the finding of suitable accommod tion in which to practise and to live. Elsewhere, a notably in sparsely populated moorland areas, qu different factors may hinder executive councils improving, or even maintaining, an already inadequa service. It was for such areas that the inducement pa ments were primarily intended; and in a timely lett the Ministry of Health reminds the councils of a fu from which such payments may be made. The mon set aside for this purpose is equal to 1% of the to central pool for the payment of general practition but it comes from a separate grant and is not a cha on the pool. This money is immediately available, a the Minister intends that the first payments sh wherever possible, be made by the end of the prese quarter. He therefore urges early action by exec tive councils, in consultation with the local medi committees, to assess and bring to his notice

> "any cases where they are satisfied that general medi services adequate to the needs of the district cannot provided, or cannot reasonably be expected to be maintaine without an inducement payment, and the amount of t inducement payment which they consider necessary to enal an adequate service to be provided or maintained."

The council is reminded that mileage payments to ru practitioners are likely to be at least double tho received in the past, but that the special-subsidy porti of the old insurance mileage fund has ceased. From th fund special payments used to be made in respect patients to whose homes access was difficult; it al subsidised heavy expenses such as those caused by t necessary upkeep of scattered branch surgeries. Fro now on such assistance will come directly from t inducement fund.

The Minister's letter suggests four other types of ca where inducement payments will probably be neede The first is where a vacancy has been advertised but applications have been received; but the receipt of o or more applications for an advertised post should n

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1. Sophian, L. H. *Amer. J. med. Sci.* 1944, 208, 577.
2. Hamilton-Paterson, J. L. *Brit. med. J.* 1946, 1, 680.
3. Popkin, R. J. *J. Amer. med. Ass.* 1946, 132, 238.
4. Pereyra, A. J. *Nav. med. Bull., Wash.* 1948, 48, 40.
5. Pereyra, A. J., Landy, S. *Ibid*, 1944, 43, 180.

Special Articles

INTRAMEDULLARY NAILING OF FRACTURES

THE PRACTICE AT KIEL

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I HAD heard of Küntscher's method of intranedullary nailing intermittently during the later years of the recent war from British, Swiss, and Dutch surgeons. The remarks of the British surgeons had been unfavourable, those of the Swiss and Dutch very favourable. As had seen no account of the method in the more widely irculated British journals, I was unable to study it ntil I visited the University of Kiel last year, where Prof. erhard Küntscher first practised this technique. and where Prof. H. Griessmann and Dr. Richard Maatz indly showed me the method. operations, results, and iterature. I am not in a position to assess the value of he method with any authority, but some of my colleagues may be interested in what I saw of it.

The principle of intramedullary fixation is old, and no ovelty is claimed for it. The present method is an xtension of the principle of the Smith-Petersen nailing f fractures of the neck of the femur to fractures of almost ll long bones, and was presented by Professor Küntscher o the Chirurgen-Kongress in Berlin in 1940; it was ceived very unfavourably by his German colleagues, ho, however, became enthusiastic about it shortly rwards.

he basis of the method is that a long slightly flexible nless-steel nail, approximately V-shaped in cross-ion, is introduced into the marrow cavity of the tured long bone from near one end: then, after tomical reduction of the fracture by manipulation, the l is driven across the fracture site, under radioscopic trol, into the other fragment sufficiently far to secure olute immobilisation. In a suitable case no additional mobilisation is required, and thus there is no loss of ction or joint stiffness. The nursing of a patient with ractured femur, for example, is much easier, and his eral health far better, than during immobilisation a Thomas splint. Further, the physiological stimulus function is conducive to early and firm union, and scle wasting is diminished.

The method has been applied to simple, compound, and hological fractures, and for immobilisation in arthro-is, osteotomy, and the treatment of pseudarthroses.

The only essential requirements for nailing are an ray plant suitable for screening (the apparatus at el is superior in point of smallness and mobility to any ave seen) and an assortment of nails of suitable sizes. Kiel the nails are made locally by the hospital instrunt-maker, and a suitable nail is selected by measurents on radiograms incorporating a scale. If there no suitable nail in stock, the instrument-maker manuctures one, usually in less than 24 hours (other hospitals legraph for them). It is important that the nail should t be too thick, because such a nail can become so mly wedged at the "waist" of the bone as to cause e greatest difficulty.

The first essential is perfect reduction. At Kiel this achieved with blocks and pulleys and, in special cases, keletal-traction wires and other mechanical apparatus. he reduction is checked by very brief screening, a small cision is made over the site of entry of the pin, and the rtical bone is pierced to the marrow cavity. Either e guide pin or the nail (see below) is then introduced into e marrow cavity and propelled along it, a further brief ew on the screen being taken as it crosses the fracture e. In the case of a guide pin the nail is now threaded wn and the pin withdrawn, the small incision is closed, d check films are taken. The operation usually lasts out 10–20 min. and is carried out under 'Evipan,' inal, or brachial block anæsthesia.

The necessity for screening is a major drawback. is is realised, and the most stringent precautions e taken. The danger of sepsis appears appalling at st, and yet it has given rise to practically no trouble, ough penicillin has not been available for any of these cases. The danger of fat-embolism also has been found to be entirely theoretical. Though it undoubtedly must occur, no clinical effects have been observed.

The following details are extracted from a careful analysis[1] of 155 cases nailed at Kiel from Jan. 1, 1944, to May 1, 1946—i.e., during the time of the worst chaos there (the clinic stands in acres of rubble and was hit frequently).

Femur

Subtrochanteric fractures are very satisfactorily controlled with a short special nail (fig. 1).

Shaft (fig. 2): a guide pin is usually employed, and it or the nail is of help in manipulating the upper fragment.

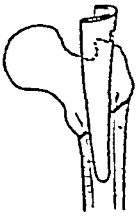

Fig. 1—Special nail for subtrochanteric fracture of femur.

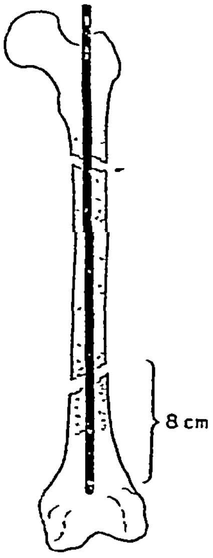

Fig. 2—Nailed fracture of shaft of femur.

Supracondylar fracture: the nail is of great value in preventing angulation, but additional immobilisation is required because of the width of the marrow cavity.

In all these cases the nail is introduced just medial to the greater trochanter.

Of 35 simple fractures 27 were stable; the others required additional immobilisation, but angulation was absolutely prevented. In stable cases the patients started walking in 7–42 days. Two patients with associated multiple injuries died; operation was an error of judgment. All others were symptom-free after 3½ months. No nails were removed before 4 months. Of 7 compound fractures 3 were stable without additional immobilisation, all united, and only one case with gross loss of soft tissue had loss of function.

Four pathological fractures were nailed and irradiated, and 2 osteotomies nailed, with excellent union.

Tibia

Owing to the hourglass shape of the marrow cavity a special double nail is inserted from the region of the tuberosity or of the medial malleolus (fig. 3). The first nail carries a wedge which forces away from it the following second nail, thus securing the lower end firmly.

Of 46 simple fractures all those put up with the double nail were stable; but 10 nailed with a single nail because of multiple fractures which the double nail could not pass, or for other reasons, required additional plaster. Even in these cases the position was far better than could have been otherwise achieved. One patient died in the 5th week of other injuries; 1 aged 81, with a fractured femur also, died of pulmonary embolus and bronchopneumonia. All others had a good anatomical and functional result. No nails were removed before 3 months, and there was difficulty in extraction in 2 cases. Of 15 compound fractures 14 were stable. One patient died of pulmonary embolus in the 3rd week; and 1 died of multiple injuries and shock (air-raid casualty). Two pseudarthroses united after freshening and nailing.

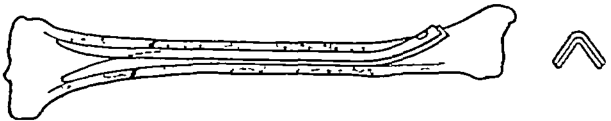

Fig. 3—Double nail for fractured tibia.

Humerus

This can be nailed with ease from below or above (figs. 4 and 5). The early and full function of arm and hand is remarkable.

Ten closed fractures (7 nailed from above, 3 from below) were all stable and achieved good union with full function. Nailing of 2 pseudarthroses with freshening led to firm union. In a compound infected fracture with multiple injuries which all but one (a doubtful case) of the 17 confirmed cases were in people who lived—or in one case worked all day—within a quarter of a mile from this railway. In Islington, on the other hand, the incidence was low and there was no such aggregation of cases near the railway. It seems reasonable to argue that incoming travellers from abroad would be likely to include a particularly high proportion of carriers of poliomyelitis; and also that virus in their excreta, deposited from the train closets, would be more readily air-borne from the top of an embankment than from the bottom of a cutting. This one example cannot be considered proof of the hypothesis, but it should spur on the Railway Executive to reconsider the arrangements for the disposal of human excreta on their trains. The sanitary engineer who designs an inexpensive device which will collect and contain train sewage during the journey and which can be rapidly emptied into a sewer at the end of the run should be assured of a handsome reward.

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[1] Griessmann, H., Schüttemeyer, W. *Chirurg*, 1947, 17-18, 316.

JUVENILE OSTEOCHONDRITIS OF THE SPINE

CHILDREN with the disorder described by Scheurmann [1] as kyphosis dorsalis juvenilis seldom make any complaint; yet many are deformed, with irregularities of ossification of the vertebral bodies; and later, under stress or strain, these changes can give rise to pain. The evidence suggests that this condition of juvenile osteochondritis is at least partly instigated by malnutrition during growth, and that benefit can result from an improved dietary.[2] In this country the worst cases have been observed among the younger members of large families in certain Oxfordshire villages where wages were low before the late war, and where severe dental fluorosis is also found among the inhabitants. In the occasional cases seen in children from the higher income groups there is a history of long-continued ill health or feeding difficulties. The geological distribution of cases indicates an association with some factor closely related to fluorine, a trace element which may itself interfere with enzyme systems concerned in the calcification of bone.[3]

Kemp and his colleagues,[4] in an investigation of the ætiology of Scheurmann's disease, compared two groups of boys—the first from a public school and the second from the poorer quarters of Oxford. Some of the boys in the first, and presumably better-nourished, group had dental fluorosis, whereas none of the second group, who were not exposed to a high fluorine intake, were thus affected. Both these groups were compared with a third, living in a village community where dental fluorosis affects nearly all the inhabitants and considerable poverty formerly prevailed. In this group spinal changes were more than three times as common as in the other two groups, and the disturbances were in some instances more severe. Although spinal changes are not always found with dental abnormality (" mottled enamel "), the probability of spinal changes in a community can be gauged with fair accuracy by examining the teeth. The investigators conclude that in view of the association recognised in other countries, of endemic dental and osseous fluorosis with malnutrition, the possibility of a similar association between dental fluorosis and juvenile osteochondritis must be borne in mind.

Whatever the intimate pathology of the disease, the practical implications of these findings are evident. Probably even the most severe cases could be prevented by a good dietary; and special attention should be given to children living in rural areas, particularly where dental fluorosis is prevalent. Thus a condition hitherto regarded as chiefly the concern of the orthopædist is in all probability completely preventable by proper nourishment.

HOSPITAL LIBRARIES

MANY doctors regret that they have not more time for professional reading. What time they have can be used best if textbooks and journals are within easy reach. Group practice enables some to have a selection of books at hand; and a similar advantage will be gained from health centres. Here and there the general practitioner finds a hospital where he is welcomed to a reading-room.

The reorganisation and grouping of hospitals opens the way to a better-organised library service; and management committees will now have to decide on the resources to be offered to their staffs. There seems to be need for a general policy, particularly in view of the continuing shortage of textbooks. In the past some local authorities took the view that their medical staffs should provide their own books; but then the cost was much less than now, and committees will certainly be called on to review this decision. Any provision will have to be made on a group basis since the supply would soon be exhausted if every hospital had even £50 to spend on books and journals. Perhaps it will be possible to enlist the help of the public libraries, which are increasingly used by serious readers and those needing books of reference, whether in commerce, industry, or the professions. Possibly each group of hospitals should aim at a centralised library, stocked in conjunction with the public library and staffed under its auspices, since the value of a library largely depends on the efficiency of the librarian. Management committees also have obligations to other members of hospital staffs. In particular, the and other auxiliaries need a professional library, the public library is not readily accessible prov should be made for their recreational reading; scription to a commercial lending library is enough to ensure a tempting selection. At least public librarian, with the cordial consent of the ho committee, has arranged to supply and staff a ho library to meet the needs of each section of the and the patients. The Minister of Health has draw attention of management committees to patients' lib as a medium for continued voluntary work withi hospital; but many voluntary librarians realise tha efficiency of their work would be considerably enha by coöperation with the public librarian. This al benefits patients by helping to meet their special req which tend to cover an increasing range. In long institutions such as sanatoria and mental hospitals is particular need for a comprehensive service; an example set by Crichton Royal has already been foll by another large mental hospital, which has establi in its grounds a branch of the county library.

The extension and integration of such a scheme req a good deal of planning: the areas of the hospital s do not coincide with those of the library author resources may be available in one place and n another; and librarians may find it hard to under additional work which may make considerable dem Clearly the regional boards will need a profes adviser to plan for the whole region; and he will to find in the medical-school librarian a sympat professional colleague; since the Goodenough r was published, the medical schools have shown g readiness to appoint trained librarians. If, as B.M.A. curriculum committee[1] suggests, "the libr indispensable and the student must be guided in its so that in his later professional life he will have in constant ally and friend," then a professional libr is an essential member of the staff.

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[1] Scheurmann, H. *Z. orthop. Chir.* 1921, 41, 305; *Fortschr. Röntgenstr.* 1936, 44, 233.

[2] Kemp, F. H., Wilson, D. C. *Brit. J. Radiol.* 1947, 20, 410.

[3] Murray, M. M., Wilson, D. C. *Lancet*, 1946, ii, 821.

[4] Kemp, F. H., Wilson, D. C., Emrys-Roberts, E. *Brit. J. soc. Med.* 1948, 2, 66.

[1] Training of a Doctor: Report of the Medical Curriculum mittee of the British Medical Association. London, 1 para. 93.

anchuria, Burma, Malaya, and parts of Africa—lived intermediate levels, getting 2500–2875 calories; while e remaining 50%—about a thousand million in eastern sia and middle America and in a large part of Africa—t less than 2500 calories. The low-income countries ve a high fertility, and as long as this fertility is aintained every modern improvement which leads to reduction in mortality leads to a spurt in population owth. The rice economy, on which millions of people pend, is peculiar. There is scarcely any other method production capable of yielding so many units of food ergy per unit of cultivated land as paddy growing, d it can be doubled by the use of fertilisers and lected plants. Conceivably it might be increased rapidly ough to outstrip the needs of the growing population, t this is doubtful. We must, in short, find more rapid eans of reducing human fertility. An improvement standards of living, new methods in agriculture, d the introduction of planned parenthood are all plementary measures.

r. H. M. SINCLAIR also emphasised the gain in production which could be expected from better cultural methods and the control of infestation, by extending cultivation to new areas. He touched some new methods: cultivation of soil-less plants, the synthetic production of fats from carbon oxide and steam.

r. A. M. DURAND-WEVER (Germany) said that in Russian Zone and in Berlin Germans have been ng on 1200–1800 calories daily for the last three years. quality of their food is poor, with shortage of fats l proteins and no fresh fruit and vegetables. The th-rate before Hitler, in 1933, was 8·7 per 1000; at height of the Hitler propaganda it rose to 14·9, l is now down to 9·2. The death-rate was lowest in 38, at 5·8 per 1000. It rose to 55 after the capitulation d is now 16.

Mr. ROY WALKER remarked that we shall soon have feed more people than can possibly be fed at the el at which people are now trying to feed themselves. diet meeting all requirements is provided by wholeal bread, fruit, vegetables, and milk; and to produce h a diet ${}^{3}/_{10}$ of an acre per head suffices, instead the $2^{1}/_{2}$ acres per head needed when animal food her than milk is taken. On such a vegetarian diet e world could get by immediately.

POPULATION TRENDS

Prof. P. K. WHELPTON (U.S.A.) pointed out that in rthern and western Europe and in the U.S.A. much naller gains in population are to be expected in the ext century than in the last. The large rise in birth-rates these countries since the war does not imply a trend wards larger families: the increase is mainly in first irths. In India, China, and elsewhere, the birth-rates nd death-rates are high, and western improvements sanitation and medical care may be expected to lower e death-rate before the birth-rate falls. These areas e potentially in the "swarming" stage, as England as at the time of the founding of her colonies. In the S.S.R. the position is intermediate: the death-rate as been materially reduced, but the birth-rate has llen to a lesser degree. Industrialisation of areas hich now live by manual labour will raise standards living, while further increase of population in these eas will tend to have the opposite effect. These problems would be simplified if the probable decline in deathtes could be accompanied by a greater decline in rth-rates. Simpler and less expensive methods of rth-control may come from the research programme the committee on human reproduction of the National esearch Council in Washington.

Dr. C. P. BLACKER classed population states into five stages: (1) the high stationary stage with a high death-rate and a high birth-rate; (2) the early expanding or "swarming" stage, when the death-rate is falling and the birth-rate still high; (3) the late expanding stage, in which the birth-rate is falling, but the death-rate falling faster (the U.S.S.R. is now in this phase); (4) the low stationary stage, when the net reproduction-rate is at unity; and (5) the declining phase. The crucial question is whether the nations can pass through stages 1, 2, and 3 to 4 without swarming and outstripping world food-supplies.

MIGRATION IN THE ADJUSTMENT OF POPULATIONS

Prof. T. H. DAVEY said that in the past migration had played an important part in adjusting national populations during expansion. France, on the other hand, has allowed immigration of foreign labourers to balance their excess of deaths over births. Nations in Blacker's second and third phases are liable to reach the population pressure which might seek relief in migration; and certainly urbanisation and emigration helped Great Britain to survive the rapid population expansion at the time of the industrial revolution. The overcrowded peoples of India, China, Japan, and the Dutch East Indies have no wide area of unused cultivable land. Of the appropriate countries to receive them only Australia and Canada have a stable population, and neither is willing to accept them. Moreover, though migration would reduce population in the sending countries for a time, the effect would be to reduce the death-rate and increase the rate of population growth until numbers were the same as before. In general, then, there is nothing to be hoped for from migration.

FAMILY PLANNING IN VARIOUS COUNTRIES

Dr. A. W. LANGEHEINE (Germany) said that before National Socialism family planning and marriage guidance were well advanced in Germany. In the early years of Hitler's rule contraceptives were still allowed but abortion was punished, and effective propaganda was used to encourage childbirth. Soon after 1939 a police order, later made law, forbade the use of contraceptives, and capital punishment was threatened for repeated abortion. These laws (capital punishment apart) have not yet been fully abolished, largely owing to the intervention of the Catholic countries, though general opinion is strongly in favour of their abolition. There has been a great increase in abortions; official figures of treated cases suggest a rate of 1 abortion for every live birth.

Dr. DURAND-WEVER recalled that in Germany in 1934 a secret order required soldiers to beget children wherever they could; and later the labour camps for young girls were deliberately put near those of the men. Since the capitulation of Germany marriage-guidance bureaus have been established throughout the Russian Zone in all the large cities, and 4 contraceptive clinics have been set up in Berlin. Abortion on therapeutic grounds is allowed.

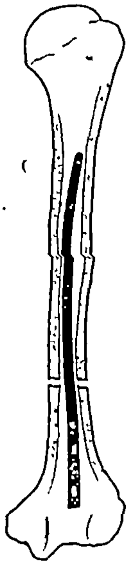
Lieut.-General KIN CHEUNG (China) said that there has never been an adequate census in China, but the population is thought to be some $463^{1}/_{2}$ million. If the standard of living is to be raised the population must be reduced. The only other way to increase national wealth is by industrialisation. Chinese intellectuals have been advising birth-control since 1919.

Dr. JEAN SUTTER (France) said that in France all contraceptive measures and propaganda are prohibited at present, on pain of fine or imprisonment. This attitude was nailed in the 4th week there was anatomical union after sequestrectomy. In a pathological fracture (carcinoma of bronchus) nailing brought about good function.

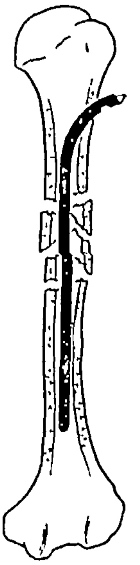
Radius and Ulna

The radius is nailed from the lower end, and the ulna from the upper end (fig. 6). The stability of this method of fixation offers great advantages here, but reduction may be difficult.

In 16 closed fractures open reduction had to be used in 6 cases (difficulties of reduction would be the same whatever the method of immobilisation). All united well except that of a workman who started heavy work 4 weeks after injury (without medical consent), broke the nail, and developed a pseudarthrosis of the ulna. This united after extraction of the nail fragments, freshening, and renailing.



(4)



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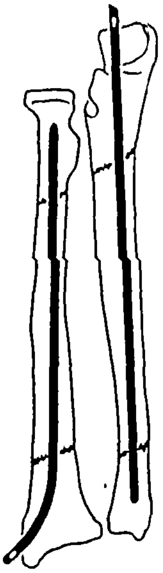

(6)

Fig. 4—Fractured humerus nailed from below.

Fig. 5—Fractured humerus nailed from above.

Fig. 6—Fractured radius nailed from below, and fractured ulna nailed from above.

Nails were left in for at least 3 months.

Two compound fractures were nailed and united well; in one a defect of 4 cm. in the ulna was bridged by bone without grafting.

My impression is that the advantages derived from the early and anatomical union, and from the full joint and muscle function preserved throughout, outweigh the disadvantages, which are mainly the necessity for a moderate amount of apparatus and for screening. The dangers of sepsis and fat-embolism appear to be largely theoretical, and there is ample evidence that the nails have no adverse effect on bone or marrow.

I am, however, not competent to pass an opinion, and merely advocate that the method should be studied far more widely than appears to have been the case so far.

The accompanying figures are based on those of Küntscher and Maatz,[2] whose monograph should be consulted for further technical details.

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2. Küntscher, G., Maatz, R. Technik der Marknagelung. Leipzig, 1945.

". . . Upon the limited soil of this planet we have to produce the food for an increasing population. There is no chance of importing supplies from Mars or the Moon. We might as well face the problem calmly and agree that we have of late years made an unholy mess of our solutions. The fault does not lie with the producers of food, who are a vast dispersed multitude of farmers and peasants. The fault lies rather with ourselves as social beings, in that we have given too little attention to what our scientists and economists were attempting to tell us. . . . We should by this time be thinking of food production and food distribution in the world as problems in good management; and many of our statesmen are obviously still thinking of them in terms of 19th century nationalism or imperialism."—F. LE GROS CLARK in *Feeding the Human Family*. London, 1948.

INTERNATIONAL CONGRESS ON POPULATION AND WORLD RESOURCE

THE International Congress on Population and W Resources in Relation to the Family, arranged by Family Planning Association, was held at Chelt from Aug. 23 to 27. Like the recent Mental H Congress this gathering ended its deliberations forming an international body. For the present takes the form of a provisional international commit to promote research and education in family planni with two representatives from each of the natio organisations in the U.S.A., Great Britain, Holland, Sweden, and such individuals from other countries they coöpt. The secretariat will be in London.

Sir JOHN BOYD ORR, F.R.S., opening the congr stated the crux of the discussion: if we cannot solve problem of world resources in this century, we heading for the greatest catastrophe in history. Bef the 1939–45 war two-thirds of the world populati were not fed, clothed, or housed up to a basic level necessity. The world population is increasing by million a year. Before 1939 it was 2000 million; the end of the century it will be 3000 million. To these people food production must be doubled wit the next 25 years. When standards of living rise, birth-rate falls; and the only way to get a static wo population is to raise the standard of living and edu tion. It was 150 years to the day, he said, since Malth published his famous pamphlet prophesying from over-population; but Malthus did not fore opening up of the southern hemisphere as a sourc food. Now we have no new hemispheres to rifle, much of our land is losing its fertility; dust bo have been created, and soil erosion means a fall reservoir of food resources. Some hold that it will be possible to provide food for all, but in Sir John C view if all cultivated land is brought up to the leve the best the same production will be possible with the acreage. Moreover it should be possible, by irriga and reafforestation, to recover land which has bee barren. We have not yet explored the resources timber, which can provide food, textiles, and essential commodities. Sir John believes we can and shelter the population likely to be achieved in next 150 years; and indeed that the total number world can feed is only limited by the amount of atten governments give to the problem. In the view Malthus, the excess population should be allowed to out; but he ignored the fact that people will not quietly. They will fight, as they were ready to d England in the hungry 'forties. We must have a w plan for food.

Dr. ABRAHAM STONE (U.S.A.) pointed out that far more food has always meant more population. improve food production is not enough: we must disseminate the means for family planning.

ESSENTIAL STANDARDS OF LIVING

Prof. FRANK LORIMER (U.S.A.) thought that to m it possible for another thousand million just to keep al would not make for peace. Malthus failed to allow the rôle of experimental science in raising food producti and for the effect of a rise in the standards of livi The more fortunate peoples—about a fifth of the worl population—were getting at the beginning of the war 2875 or more calories per person per day. Th included all the peoples of Western Europe, Austral New Zealand, and the American countries north the Rio Grande and south of Brazil and Cuba. Anot 30% of the world population—in southern and easte Europe, Soviet Russia, Brazil,

their work. They should rather ask why others have
led to undertake such a plain duty.

CURRENT RESEARCH

Dr. **Earl Engle** (U.S.A.) indicated some possible
es of research on semen. The spermatozoon emerges
m the testis with a complete store of energy, but
is also capable of metabolism. On an average,
) million spermatozoa must be present if an egg is
be fertilised. The state of the cervical plug of mucus
lso a factor in fertilisation. This mucus is hygroscopic,
l its state is under the control of œstrogens, so that
times it becomes more fluid and thus more readily
meable.

)r. **John Rock** (U.S.A.) favoured teaching young
ple family planning rather than encouraging them to
nk of the drawbacks of babies. Fertility is highest
the early years; and people are apt to use contra-
tives in these years and then to ask the gynæcologist
help them to get a child in the infertile years. In
.S.A. it is found that only people who have had
han 4 years of education replace themselves in the
generation; college graduates have not replaced
selves since 1860. One way of interfering with the
ductive cycle is to use hormones to stop ovulation
time.

of. **F. A. E. Crew**, F.R.S. said that fertility genes
lemonstrable in living forms other than man, and
an pedigrees suggest that they are present in man
Some genes are lethal and slay the individual
re he has time to reproduce. Hæmophilia, for
nple, kills the homozygous fœtus in utero, and
tens the life of the male. The higher the species,
the longer lived and the larger the animal, the
r the offspring. The human female is not well
ipped to produce more than four young in all;
from the child's point of view all the evidence
to show it is a bad business to be the first
d and a serious mistake to be the fifth, sixth, or
nth.

r. **Margaret Hadley Jackson** said that the
hasis at the congress had been on expanding popula-
s and diminishing food, and little had been said
ut the encouragement of families. We belong,
ever, to a country in which the curtain is about to
on the fourth act of Dr. Blacker's demographic
ma. It may be that a different method of approach
eeded in different areas of the world.

* * *

The congress urged the governments concerned to
e all possible steps to help the occupied countries to
establish their former organisations for planned
renthood.

In England Now

A Running Commentary by Peripatetic Correspondents

Any mug can wangle staphylomycin out of the Ministry for a pulmonary case, said our registrar. By the time you've read the third page of the patient's notes the tired bloke at the Whitehall end of the telephone more or less insists on sending you a month's supply. Of course, if its non-pulmonary you've got to give the Whitehall bloke some "cover," as he calls it—say that the patient is writing a personal stinker to the Minister, or that the *Daily Largesse* has offered to fly you the stuff forthwith. If the worst comes to the worst you can fall back on what was left over from the last case of meningitis.

What mugs these registrars must take us for, said the staphylomycin M.O.(supplies) moodily. By the time they reach the third page of notes on a case in which they obviously haven't done a bronchoscopy I usually chip in and say there's nothing doing until they have. Then the blackmail starts. Either the patient is writing a personal stinker to the Minister or else the *Daily Largesse* has been sniffing round. What sometimes does get my goat is the airy fairy way in which they finally say that they suppose after all they'll have to go to the black market for it as they do for their private patients.

* * *

Having duly warned the opposition that our team contained three schizophrenics and a manic, we lost the toss and went out to field. The game resembled cricket for the first ten minutes. Then one of our opening bowlers, having spent his morning in the depths of an insulin coma, had his usual hypoglycæmic reaction after the fourth ball of his second over. We were by now able to recognise the onset in the prodromal stages as the usual symptoms were ushered in by a succession of wide full tosses and long hops. These derived from his diplopia, and, while the sight of six stumps instead of three might have been expected to increase his confidence no end, they were unfortunately seldom seen as an even row but more often as two sets of three, one set being in line either with first slip's head or silly mid-on's feet. Twelfth man trotted out with a jug of glucose in time to avert the collapse of the bowler and the ruin of his analysis. Neither umpire could remember any rules applicable to such a complication, but after a lengthy argument it was decided to count the four balls as an over and resume from the other end. Two wickets promptly fell, one being that of the visiting captain, who complained bitterly and not unjustifiably about the mechanism of his defeat.

Our manic was wicket-keeper and had two habits which doubtless caused the late Dr. W. G. Grace much subterranean revolution. First, he never stopped talking throughout the match and many a batsman, through trying to follow the flight of ideas with his ears, failed to follow the flight of the ball with his eyes. Secondly, he appealed deafeningly for any ball that so much as touched a batsman, be it on belly, breast, or brow notwithstanding. Unnerving at the best of times, this technique was particularly successful now because our umpire at the other end was a passive homosexual midway through a course of electrical convulsion therapy. This masochistic little chap would rather die than hurt other people's feelings by disagreeing with them, and he raised his finger in dismissal if our manic so much as looked hopeful. Brisk rebuke and brief psychotherapy had to be administered to these respective gentlemen before the arrival of the next batsman. He, however, had been much unsettled before even reaching the crease, for as he passed cover-point that fieldsman whispered with intensity, "I know what you're thinking about me but you're wrong!" Consequently this batsman was too self-conscious to do anything but hit the first ball straight back into the bowler's hands.

This was the last incident for quite a time and things went almost normally till our turn came to bat. They had a very useful spin bowler, who was also, unfortunately, a very dusky West Indian. Number four in our batting list had embarked on his paranoid schizophrenia

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"... We are assured by Dr. Ernest Jones that a constitu-
nal monarchy uses for the good of the State impulses and
dencies that are deeply buried within the human mind.
man beings crave for the protection of a lofty and conse-
ted parental figure. Their attitude towards this figure is
bivalent; but the constitutional system provides them
h the beloved good parent who is the sovereign, and the
ential scapegoat parent who is the Prime Minister. So far
Jones. Matriarchal rule goes one step further. It removes
possibility of rivalry towards the parental figure by
[illegible] on its behalf the need for maternal warmth and
[illegible] To translate this into everyday language: a female
r calls forth deeper loyalties and chivalrous devotions, it
dles in the subject a desire to defend and to protect,
ead of leaving him possessed with the sole desire of being
ended and protected."—G. J. Renier, *Manchester*
ardian, Aug. 30, 1948.

is governmental rather than ecclesiastic, and is called forth by the stationary population. England and Wales, Italy, and Germany are now following the demographic cycle in which France has been the pioneer.

Dr. G. NYCANDER (Sweden) said that the birth-rate reached its lowest point in his country in 1933, but has now recovered again. In 1946 abortion was legalised for conditions liable to endanger the health of the mother, and in cases of rape. In 1945 sex education was finally begun in schools.

Dr. P. A. VAN HUET (Holland) said that though the population of Holland had trebled in the last hundred years, and though the death-rate was the lowest in Europe, the Roman Catholic Church worked against contraception. There are legal penalties for publishing anything on the subject. Nevertheless centres have been opened and deal with both family planning and subfertility. In 1946 the Netherlands Society for Sexual Reform was founded, and has set up marriage schools for young people.

Dr. F. POLASEK (Czechoslovakia) noted that there has been a steady increase in the birth-rate of his country since the 1914–18 war. Government policy encourages this by tax remission, free antenatal and maternity care, priority in housing, and free medical treatment of infertility. There are no legal restrictions on contraception but the practice has never found much support. The government aims at a further increase of the birth-rate and the reduction of illegal abortion.

Dr. J. N. KHOSLA (India) said that the death-rate, though high (22 per 1000), has fallen. Polygamy, though permitted, is little practised, since women number only 93% of the men. He felt sure Indian women would respond as well as any other women to social change, but they have had very little sex education. Religion, he said, plays no part in the regulation of social affairs in India, but social customs do.

Prof. M. LANVAL (Belgium) observed that in his country birth-control was listed with things dubbed obscene; so anyone interested in family planning is now stigmatised at the outset. However, the law only prohibits the selling of contraceptives and the giving of contraceptive advice for profit, so doctors can give advice free—and appliances, too, if they can find a chemist who will sell them at face value.

Mr. F. M. MANSOUR (Egypt) gave two reasons for the large families of Egypt: as a sort of insurance (because infant-mortality is high and surviving children mean an easier old age); and as a hobby (because a family is a great source of interest and pleasure when there is not much other entertainment going). If the Egyptian population is to be restricted there must be a revolution in the means of production by industrialisation.

Dr. OKU AMPOFO (West Africa) said that at the start of the century his part of the world had emerged from the results of the slave-trade and was adjusting itself to European occupation. The native population in the Congo had been reduced by slavers from 8 million to 1 million. Commerce, however, has meant a change in the standard of living; and now children are becoming a liability because of the high cost of living and education. Feeling is tending towards small families and the abolition of polygamy.

BIRTH-CONTROL AND POPULATION

Dr. NILS NIELSEN (Sweden) said that birth-control alone cannot be responsible for the falling birth-rate in western Europe and elsewhere. Swedish population statistics, which date from the beginning of the 18 century, show a slowly declining death-rate an first a high birth-rate; later the birth-rate beg fall in the towns and afterwards in the country. 1910 the rate fell until the early 'thirties, since when has been a small but rapid rise. It is a common cu of the country not to marry until after the birth first child, and not always then—indeed, about ha adult population is unmarried—so the extram birth-rate is always high. Paradoxically, little control was taught until the birth-rate decline w full swing. Birth-control may be potentially dang to a race, but extreme limitation of family is cause economic factors and must be corrected by econ reform.

Dr. STONE talked of the remarkable change i U.S.A. since the time, 25–30 years ago, when Margaret Sanger started her campaign for family plan All the Churches have recognised the importan family planning for the stability of the family, th they may differ on methods. The law has been rede so that it no longer offers a barrier. The medical profe have recognised birth-control as a therapeutic mea and give instruction on it in the medical college 5 States birth-control advice is included in the pu health service, and it is hoped that in time such a will become a part of the Federal Public H Service.

Mrs. M. A. PYKE said that in Britain more tha the local authorities now give contraceptive advi any woman who needs it on medical grounds. It is h that in the end family planning will be an integr part of the public-health service, but for the pr it works well as a combination of voluntary and of effort. The Family Planning Association undert much research into contraception and subfertility.

Dr. S. CHAUDRASECCA (UNESCO) said that popul problems have always been a factor in causing UNESCO is starting research projects on populatio relation to various countries.

Miss MOYA WOODSIDE (U.S.A.) noted that in N Carolina there was a law allowing voluntary sterili on medical grounds for psychosis, epilepsy, and m defect. This is, in fact, being extended widely, unoffici to include women with large families.

ADVANTAGES OF FAMILY PLANNING

The Rev. JOSEPH MCCULLOCH said that contracep has only recently been rescued from evil associat Family planners, however, are only concerned those who oppose contraception for married pe These fear that mankind will end in race suicide, that birth-control encourages the pleasure principle irresponsibility. Such views are based on an unc promising estimate of man's unredeemed nature. Fa planning must be taught as a true fulfilment i personal relationship. The way of redemption is raising of the individual level of moral responsibi Man is born to know more and more what he doing.

Mr. KENNETH WALKER, F.R.C.S., remarked that fa planning relieves the mother of the danger to health life produced by an uninterrupted series of pregnan It is preposterous to suggest that the chief motive spacing a family is a desire for luxury. Fear of imp nating his wife, when the family is already as larg he can afford, may make a man impotent.

Dr. C. VAN EMDE BOAS (Holland) wondered why fa planners were always relieved to hear an ethical defe aminers, and the 4th (who was a "borderline pass" the part 1 examination) has now withdrawn from the dical school.

All students who failed in their first attempt at the rt 1 examination and who received between 45% 149% of the marks passed the part 1 referred examinan. but subsequently had difficulty with the part 2 mination. Those who failed part 2 on their first empts succeeded, however. on the second. All our ntual failures came from the group who did not get % in their first attempt at part I. Those of this group o ultimately succeeded in passing part 2 did so by a y narrow margin.

Of the original 83 students who commenced the egrated curriculum in anatomy and physiology. 70 re therefore moved on to the fourth year of the dical course: 9 were referred in examinations, 2 have hdrawn of their own accord, and 2. who were away ause of illness, have fallen back a year.

The high correlation in the showing of students in t 1 of the examination, which is mainly topographical emphasis, with that in part 2, which is mainly physioical. is interesting. We should like to think that it is. least in part. attributable to the close integration of tomical and physiological teaching throughout the rse.

Department of Anatomy,
ndon Hospital Medical School.
J. D. **BOYD**

Department of Physiology,
Leeds School of Medicine.
A. **HEMINGWAY**
External Examiners.

Department of Physiology,
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H. P. **GILDING**

Department of Anatomy,
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C. F. V. **SMOUT**
S. **ZUCKERMAN**
Internal Examiners.

LATENT TETANY CAUSED BY BAL

SIR,—The article by Dr. Russell and colleagues ly 31) calls for some comment as the authors' conson that "all the symptoms of toxicity from BAL capable of explanation as latent tetany" is hardly stantiated by the reported facts. The symptoms of ent tetany are not reliable diagnostic criteria. They variable and may simulate a number of other condins such as anxiety state, asthma, hysteria, and lepsy. Also, if a patient in latent tetany develops mps he almost invariably develops some degree of popedal spasm, and this was not specifically mentioned having been seen by the authors. Furthermore, the of symptoms noted with BAL intoxication includes ms which are very rare in latent tetany—e.g., miting, and a burning sensation or pain in the eyes, se, mouth, and throat. Tingling or numbness is the re typical symptom of latent tetany. Severe abdominal in does not occur except in gross tetany with definite popedal spasm.

The fact that Trousseau's sign was negative except one instance is also contrary to what one would expect latent tetany. Indeed, the single positive response t of thirteen subjects is what might be found with y group of young adults who are physically upset by e injection and collection of blood. It is also unwise base a diagnosis of latent tetany on Chvostek's sign; 72% of hypocalcæmic adults it was negative,[1] while raham and Andersen[2] have condemned it as a phenoenon unrelated to tetany. From my recent experience the press) it seems reasonably reliable in the acute tanies such as Dr. Russell and colleagues were studying. must be accepted with precautions, and the degree of sponse should be recorded in some accepted classificaon such as that of Frankl-Hochwart. Lastly, the study electrical excitability is not in agreement with the gnosis of latent tetany.

These criticisms are offered with the feeling that the pothesis is not established and yet is not necessarily se. Indeed it should be easy to decide the issue by ing BAL plus constant intravenous calcium gluconate; d also by producing experimental hyperventilation any[3] in the subjects later and comparing the symptoms with those of BAL intoxication. If the existence of tetany with BAL intoxication is established the cause must be sought in the usual places first. The patient whose case was recorded by Dr. Russell complained of vomiting and profuse sweating. and may well have been hyperventilated. The single estimation of alkali reserve done some days after the last BAL injection does not disprove the possibility of alkalosis tetany.

Dublin. D. K. O'DONOVAN.

SMALLER AND BETTER PRACTICES

SIR.—Your leading article of Aug. 14 is very much to the point. General practice is in danger of being swamped by a tidal wave of patients requiring attention. Many items are trivial and can be attended to by a good secretary with some first-aid training. There are the requests for corsets. glasses, milk, drug repeats, and miscellaneous certificates; there are continuation dressings and routine injections. Perhaps a short account of a partnership in an urban and rural district which is organised to produce the maximum medical efficiency and to avoid all non-medical and trivial tasks would help others confronted by new threats to their standards of medicine.

My partner and I have about 4000 patients between us. We cover an area of 60 square miles and we motor about 1200 miles a month on our rounds. We work 12–14 hours daily and allow ourselves one half-day a week and two Sundays in a month free of calls or other duties. Our secretary is busy from 10 A.M. until 7 or 8 P.M. We hold surgeries three times daily at the urban centre and twice weekly at two rural centres. But these surgeries are performed by one of us only, in a fixed and equal rota. In this way all our patients are assured of seeing either of us at one or more surgeries every day at the centre and once weekly in the two rural surgeries. They all know which of us will be on duty at any particular surgery, and if in doubt can inquire from our secretary. This member of the team is most essential and acts as a screen to shield us from trivial tasks and wasted time.

Our nearest laboratory is 15 miles away. X-ray facilities and the county hospital are 30 miles away. There are no medical consultants of the first degree nearer than 70 miles away. Consequently we try to be comprehensive and only send cases away for very complicated investigations and for surgical treatment. In order to undertake proper medical diagnosis we find the following equipment is necessary:

1. A microscope and bacteriological stains for blood-smears, sputum tests, and centrifuged deposits of urine.
2. Apparatus for accurate hæmoglobin estimations (Sahli's for domiciliary use and Haldane's for surgery use); hæmatocytometer tubes for red and white cell counts; special stains for reticulocyte counts.
3. A Westergren blood-sedimentation tube.
4. Gerrard's ureometer for urea-clearance and urea-concentration tests of renal function.
5. An X-ray apparatus with a fluorescent screen for assisting in the diagnosis of heart, lung, and gastric disease, for the treatment of fractures, and for the assessment of injuries and diseases of joints. We have found many new cases of tuberculosis in this way, and have been able to reassure many patients of the absence of pulmonary or cardiac disease. All cases presenting doubtful X-ray appearances are naturally referred to an appropriate specialist.

A good secretary can take routine X-ray films and develop them. She can do blood-counts and test urines. She controls the internal telephone exchange and deals with all incoming messages at her discretion, passing some on to our private residences or surgery, or simply taking action without bothering us. In this capacity she contacts specialists, house-surgeons, and colleagues by telephone, and saves us hours of waiting on the line.

We use a consulting-room and a separate smaller examination-room, so that any patient requiring a complete examination can be by-passed to the latter without interrupting the surgery circulation. The consulting-room also has a completely screened-off couch for full examinations. By these methods two patients can be seen at once in little more time than it takes to chat about the weather and the news to one patient dealt with by the "bottle-of-medicine" in West Africa with beliefs, supposedly false, that the darkies were depriving him of his virility by means of witchcraft. Now he complained that this Sambo was making meaningful faces at him in the course of his run-up. He also suspected that the ball had been rendered radioactive—certainly a novel, if improbable, adjunct to any bowler's armoury.

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[1] O'Donovan, D. K. *Irish J. med. Sci.* 1945, p. 146.
[2] Graham, S. G., Andersen, J. H. *Lancet*, 1924, i, 1307.
[3] O'Donovan, D. K. *Irish J. med. Sci.* 1943, p. 564.

Logic did not prevail: number four stalked off the field and was entered in the score book, after another conference, as "retired hurt." This apt suggestion came from the opposing captain, who now seemed, much to our relief, to be entering into the spirit of the thing. Even so, it was perhaps as well we lost by 40 runs.

* * *

When my friend the physiologist proposed that we should go and watch the Olympic weight-lifting, I responded with negative enthusiasm. Why, when the world is so full of a number of things, why choose weight-lifting? But his ardent pursuit of any and every phenomenon of the physical universe is infectious as well as enviable. So in due course we took our seats, armed cap-à-pie—he with an enormous pair of binoculars and I with a pencil and the back of my ticket (for working out averages and standard deviations and all that: la science, toujours la science!).

Why are negroes so successful in athletics? The physiologist speculated on the advantages of a less excessively developed cortical control, and referred me to the shorter reaction times that have been observed with left-hand responses; presumably the cortex leaves the left hand to its own devices a little more than the right. As he said, you can have a manager or a second to do any preliminary planning that may be necessary; when the gong sounds it is best to be a complete blank from the basal ganglia upwards, to avoid any "psychopathology of everyday life." Perhaps it would have been possible to estimate the I.Q. of the competitors from their idiosyncrasies when they mounted the stage. One man invariably plodded backwards and forwards across the back of the stage several times, then marched up to the bar, grasped it—and then straightened up again. The suspense was terrible. Another always stood over the bar for 38 seconds (average), apparently in deepest thought (possibly self-hypnotism). Others adjusted the bar to exact parallelism with the front of the stage. None took less than 3 seconds over these preliminaries, the mean being 10·65 seconds. My ticket was too small for me to work out the standard deviation, but I don't suppose you care. Also—I nearly forgot—weights were lifted, phenomenal weights. Given the necessary muscle, the great thing here is coördination, particularly in the way of balance; it doesn't do to topple when you are supporting the equivalent of two 12-stone men. Many resounding thuds testified to this. Finally, I must spare a word for the three judges, who gave their decisions, often on subtle technical points, almost before the bar had reached the floor—not always to the satisfaction of the spectators, who were not diffident in expressing their own opinions. Altogether, a good time was had by all, including the two scientists.

* * *

Most doctors seem to be feeling frustrated over the question of new cars just now; but few can have experienced the refinements of torture suffered by myself, a poor struggling assistant in the suburbs of Coventry. As I bounce (literally) along the streets, most of which appear still to be suffering from the effects of the blitz, while my poor 1935 Morris "8" rattles with loose bodies in every joint, agony piles on agony as a succession of new Jaguars rolls by on test (I did experience a certain thrill at seeing one of the breed speeding along a nearby country road with test-plates and left-hand drive). Humbers, Hillmans, Standards, and Triumphs, all shining new, seem to be posted at strategic points along every road expressly to make my torture worse. At really bad moments I go along and park outside the Riley works and gaze wistfully at the new models in the yard. I have one slight consolation. By the time I can afford a new car the shining beauties I see today may all be going second-hand for a mere twenty pounds or so.

Letters to the Editor

INTEGRATION OF ANATOMY AND

SIR,—A year ago you published a letter[1] rec the results of the first examination taken in th grated curriculum for anatomy and physiology Birmingham University instituted in 1946. Th liminary information was submitted in response request from one of your correspondents, and we took to add to it, as we can now do, after the part of the course had been completed. As some has elapsed since our last note on the subject, it be advisable in the first place to outline the innovations of the Birmingham curriculum. They

1. To combine the anatomical and physiological in every course of lectures, and to avoid separate in the two "subjects."
2. By divesting the subject of much unwieldy, and pr unnecessary, detail, to confine dissecting-room to three instead of five terms.
3. To devote the anatomical teaching of the fourt fifth terms to surface and radiographic anatomy neurology.
4. To divide the 2nd M.B. examination into a first dealing with topographical anatomy and h taken at the end of the third term, and a second dealing mainly with physiology and functional ar

In October, 1946, the first integrated course was by 83 medical students. In the following June 81 the part 1 examination and 58 (about 70%) pa 22 out of the 23 who failed, and one of 2 students had been absent from the course because of prepared for the referred part 1 examinati September, 1947, when 21 presented themselve examination and 14 were passed. The 7 who failed asked to withdraw from the school.

The 72 students who had completed the part 1 tion took the courses of the fourth and fifth terms o curriculum, which, in addition to the usual classes in physiology and biochemistry, included classes in neurology, surface anatomy, and All sat the 2nd M.B. part 2 examination in March o year. The examination comprised two written one of which included three questions of a morpho nature. Practical examinations were held in bic in experimental physiology, and in anatomy. anatomy examination, which was in the form of voce, not only covered those aspects of anatomy had been actively taught in the fourth and fifth but also attempted to discover how much topographical anatomy had been retained by the The standard of the whole part 2 examination least as high as the usual 2nd M.B. examination. but 10 of the 72 candidates satisfied the The 10 who failed were allowed to sit a referred examination in June, when all but 2 passed.

We were agreeably surprised to discover a high stan of retention of topographical knowledge, and, so f the anatomical aspect of the integrated course is cerned, we are satisfied that the students who now completed the course have at least as good a k ledge of topographical anatomy as is usually dema from 2nd M.B. candidates. We are also confident their familiarity with neurology is greater than is u in 2nd M.B. students.

The whole course has permitted two separate ev tions of all students under full examination conditi and in the case of those who failed either the pa or part 2 examination (or both) three or four. possible, therefore, to derive certain further inf about performance and about the likelihood th student's showing in the part 1 examination is indication of his probable results in part 2. All candidates who achieved a mark of 55% and ove part 1 passed in their first attempt at part 2. O who obtained between 50% and 54% in part 1, passed in their first attempt at part 2. The 4 who sat the part 2 referred examination; 3 satisfied he treatment of a number of young persons with disease "in succession." It is just these early which respond well to a strict and prolonged ıe of bed rest, with or without associated collapse py. It is apparent from the average type of case tted to hospital or sanatorium that not all physicians with Dr. Stradling's selection of cases; in fact, mes one wonders if the available beds are not dered by some to be for the use of the homeless and able. We do not think the bed position would be ly improved by giving the chest-clinic physician ect control" of all beds. We think the answer n closer coöperation between the hospital and sana- m physician on the one hand, and the clinic physician ne other. Let the first have his outpatient depart- where he can see old and new cases, diagnose. , and follow them up, and let the clinic physician beds in hospitals. It is impossible to expect the physician to undertake the care of more beds and act as consultant and specialist for a population of arter of a million or more, often spread over wide ; our Scandinavian colleagues usually serve an containing a population of about 60,000, and no ment is undertaken by the clinic. By handing some of the outpatient work to the sanatorium ı, the clinic physician could ease the burden upon elf, although a much greater number of physicians be needed to work an efficient service.

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[1] Boyd, J. D., Smout, C. F. V., Zuckerman, S. Lancet, 11, 150.

here is no doubt that the centrally administered ing-list causes too much separation between the physician and chest hospital. Much could be to improve this position and make coöperation more ticable if chest hospitals were affiliated to nearby ics. Cases could then be referred direct to the pital covering the area, and the more direct contact ld offer a chance of real coöperation between chest pital and chest clinic.

it not time that cases requiring major thoracic ery came under the personal preoperative and post- ative supervision of a surgical team with its own and waiting-list? The clinic and sanatorium sician would each consult freely with the surgeon, would then decide the relative urgency and optimum e for operation in each case. Few surgeons would gree that it would be wise to have a physician of erience attached to each surgical team for day-to- consultations. We feel certain that in this way ter use would be made of beds, and a better service rded to our patients.

inally, it should be obvious that any suggestions for rcoming the present lack of beds by lowering the ndard of nursing and medical treatment, are to be recated as a long-term policy. The remedy lies mately in taking whatever steps are necessary to edy the nursing shortage.

B. J. DOUGLAS SMITH
C. J. STEWART
W. E. SNELL.

olindale Hospital,
London, N.W.9.

SIR,—The magnitude of the problem created by the ortage of beds for patients with pulmonary tuber- losis is indicated by the frequency with which this estion is discussed in your journal. Waiting-lists are long as ever. Until more beds are available, the est physician must use the beds at his disposal so that many patients as possible receive treatment in the ortest possible time. One of the means to this end is a astic reduction of stay at the sanatorium before and er collapse therapy, careful consideration having been en to all the relevant factors, including home nditions.

Collapse treatment in the patient's home can play an portant part in shortening the waiting-list, as has eady been observed.[1] It can be started in the home not ly in cases with minimal disease but also, without undue , where the disease is moderately advanced, whether ilateral or bilateral, especially when the patient's erves seem nearly exhausted. A few weeks or months preliminary rest in bed will point the way to be lowed in treatment. The patient with bilateral ease still suitable for collapse therapy can have at least one pneumothorax successfully established while waiting for admission; once admitted, if in need of major surgery for his other lung, he may need only a short spell for detailed investigation before he is ready for operation.

Perhaps the greatest difficulty in carrying out domiciliary collapse therapy lies in picking the right type of patient. So far, I have done about 30 inductions in patients' homes. Among the criteria I consider of major importance are: the X-ray appearance, the patient's attitude to the prospect of protracted rest in bed, his temperament, and finally the home conditions. The X-ray appearance should be such that the success of collapse therapy appears probable: and before induction the patient must have stayed in bed for at least 1–2 months. To check on this, I usually visit the house a few times without previous warning; generally speaking, the patient must be a "collaborator." At his home the patient should have at least somebody in the house to prepare his meals and be at hand. Sympathetic guidance may often help to create more tolerable conditions in the house.

The success of any treatment depends materially on the patient's morale, especially when treatment is lengthy. Now that the value of collapse therapy is generally known, it is difficult to persuade a patient that all he needs is rest in bed at home for 6 months or longer. Treated in this way, his morale may have vanished long before he is admitted to sanatorium—and with it his prospect of a favourable prognosis. We are all agreed that the ideal place for this therapy is the sanatorium, but while reaching for the desirable we must not by-pass the attainable. The acceptance of Dr. Stradling's suggestion regarding continuity of treatment would foster domiciliary collapse treatment.

City of Leeds Health Clinic. HERMANN GRUNWALD.

MEDICAL USES OF POLYTHENE

SIR,—Let me congratulate Dr. Farquhar and Dr. Lewis (Aug. 14) on their description of a technique which is, as they claim, a definite advance in intravenous therapy. Ureteric catheters have, of course, been used in somewhat similar fashion for many years with varying degrees of success. I would be interested to know what means they adopted, apart from splintage of the proximal flexures, to prevent the normal posture of flexion of the infant, particularly in the arms, stopping the flow of fluids by kinking the veins.

However, before Bateman's and similar cannulæ are discarded one might point out that very successful intravenous therapy is possible with them; in the gastro-enteritis unit at this hospital many "cut-downs" have lasted for seven days or more with minimal phlebitis, and one, regarded as somewhat of a record, ran for fourteen days with very little venous reaction.

That the elimination of trauma to the vein, apart from the initial insertion, is important is well shown by the readiness with which a phlebitis will occur in a restless infant, as distinct from the placid or flaccid one. Other factors are of considerable import, such as the substances used for transfusion or infusion and the avoidance of unnecessary interference and infection; but I have always been impressed by the need for adequate and secure splintage, and for sedation of the very restless infant when rigid cannulæ are used. The flexible catheter reduces this factor to a minimum.

My main object, however, is to plead for a more general adoption of a technique which appears to be the routine in most trans-Atlantic units and in some Continental ones—that of direct venepuncture. The success with which this method is practised depends mainly on the environment and the enthusiasm with which it is fostered. Following the advent of a Canadian lady for a tour of duty on our gastro-enteritis unit, for some months over 50% of all intravenous infusions were done by this technique. As an example, one infant, the severity of whose illness necessitated continuous intravenous therapy for 28 days, left hospital with only one "cut-down" scar. One of these "stab" drips has run for nine days, at an average rate of a litre daily, taking various fluids including 5% glucose, Darrow's solution, blood, and plasma. For the actual venepuncture, selected hypodermic or small intramuscular needles can be used;

Maclean, A., Gemmill, J. S. *Lancet*, 1948, i, 173. Pritchard, F. K. *Ibid*, p. 302. Stradling, P. *Ibid*, Aug. 21, p. 311.

technique. The examination-room is invaluable for fluorescent screening, ophthalmoscopy, antrum illumination, and any dark-room technique. It is also used for minor dressings, routine injections, and antenatal supervision.

We are both fully occupied with our patients' health and welfare, and we try to give them comprehensive medical supervision. We are doubtful if we can achieve a sufficient income under the N.H.S. for such an expensive outlay and service. We are faced with the possibility of having to reduce our standards of practice unless the Government are willing to recognise the financial strangulation of smaller practices. Yet better medicine can only be done with a smaller list.

Grange-over-Sands. P. D. MULKERN.

SIR,—Having read your recent leading article (Aug. 14) on the maintenance and improvement of the standard of general medical practice, may I point out another major aspect of the N.H.S. which militates against this? Every improvement in facilities—every instrument or apparatus that is now acquired by a general practitioner—is a financial loss. He cannot charge his patients even a small fee to cover the actual cost of it. If he does not provide any improvements his income will remain much the same. There appears no incentive, except the doctor's pride in his work, to provide more than routine treatment. In fact financial loss loads the balance against any display of initiative.

Burley, Hants. P. R. G. HOWARD.

ARTIFICIAL INSEMINATION

SIR,—At the risk of appearing unduly sensitive, I am requesting you to allow me to reply to certain criticisms in the report of the Archbishop of Canterbury's Commission on Artificial Insemination[1] bearing upon a memorandum issued by the Medical Defence Union.

The union's memorandum did not purport to be an exhaustive study of the subject from all angles, and this the union had neither the facilities nor the intention to undertake. It was written, as the headnote states, solely with a view to the protection of practitioners who engage in the practice of artificial insemination. In these circumstances the criticism that the memorandum is "superficial" is entirely unjustified.

It is, moreover, stated that the memorandum is "grossly misleading," but no indication is given of the reason for such strong language. The chapter of the report dealing with the legal aspects of artificial insemination fails to reveal any basis for the criticism, unless it be that the writers have confusedly attributed to the union the authorship of an article in a medical journal[2] or assumed that the union shared the views expressed in that article. Should this be so, it is appropriate now to repudiate on the council's behalf both the authorship of the article, and agreement with the views therein expressed.

It is conceded, of course, that the union's memorandum did not make reference to the difficulty that will arise over the registration of the birth of an infant resulting from artificial-insemination donation, since registration is not a matter with which the practitioner is normally concerned. The difficulty is a very real one, and to it further consideration will be given by my council in the future; for this constructive criticism we are grateful.

It is regrettable that the authors of the chapter in question should have thought it proper to publish strong condemnation of the views expressed by the union in a matter of complexity and public importance without first giving to the union some indication of their intention and an opportunity of expounding its views. The very eminence of the authors in their own field promotes an expectation that the usual courtesies would have been observed.

It should further be noted that permission to publish the union's memorandum as an appendix to the report was only sought when the report itself was in galley proof and at a time when the urgency of publishing the report precluded the union from properly considering whether the memorandum—prepared, as it was, with a different object in view—was suitable for such p I add with regret that neither then nor at any time was there any communication to the union th memorandum was or would be made the subje criticism.

Except for the single matter mentioned above, appears at present no need for the union to mo any way the advice to its members set out in memorandum.

49, Bedford Square,
London, W.C.1.

ROBERT FORBES
Secretary, Medical Defence

BEDS FOR PULMONARY TUBERCULOSIS

SIR,—In his letter of Aug. 7, Dr. Tattersall the problem of making 15–25 beds serve the needs population of 110,000 with a tuberculosis death- 60–70 per 100,000. It would not be surprising if in a situation his motives were to become somewhat Should he regard tuberculosis as an individual prob In this case every patient, regardless of the exte his disease on diagnosis, would be equally entitled treatment bed. Should his chief concern be the infectivity of his patient? In this case segregation even the most risky form of treatment might be able. Should he be concerned with the wider problems affecting the tuberculous family? In thi the middle-aged breadwinner with relatively ex disease should have priority over the young with the minimal lesion. Some light may be thro Dr. Tattersall's dilemma by reference to Wickste "Administration of Resources and Choice be Alternatives."[1] At the present time his is perhaps influenced by his belief in the efficacy of collapse therapy, and he claims that he has ren 30% of his infectious cases "safe" by these though "their ultimate fate is undetermined."

The correspondence which has followed Dr. Ben article illustrates the extremities of medical improv to which we are driven by the inadequacy of th accommodation for the tuberculous. Surely we abandon the pretence that a brief admission to a make some adjustment in the respiratory mech can exert a lasting influence on a disease with complicated ætiology as pulmonary tuberculosis. patient himself requires long and careful handling the "crash A.P." for the early lesion is more often not a disastrous measure. The introduction of st mycin will further complicate therapy, and will an even nicer judgment in timing surgical interve

Some facts in the situation cannot be disp pulmonary tuberculosis is the greatest destroyer of adult life; it presents an immense social problem given time and opportunity treatment can be efficacious. Can these things be said of many conditions which secure admission to the medica surgical wards of general hospitals? It is surely t say that on the medical wards of a general hospit average age is nearer 60 than 20, and the patients suffer from intractable and untreatable diseases. the main nursing effort of the country is concentrat this relatively unpromising material, to the disadva of urgent and treatable cases of young adult phthi

It is an interesting thought that if each of the g hospitals in this region were to second one nurse three months, for special duties and training, to the hospital from which this letter is written, it wou possible to open at once the beds which are now through lack of nursing staff. The present wa admission is nine months.

County Hospital, Harefield, Middlesex. L. E. HOUGH

SIR,—The letters of Dr. Tattersall (Aug. 7) an Stradling (Aug. 21) both put forward useful sugge for overcoming, at least partially, the difficult finding suitable accommodation for the tuber patient. Particularly valuable is Dr. Strad suggestion for the reallocation of hospital beds in ge so that more can be devoted to the treatment of the tuberculous adult.

Some of his views, however, are more debata for instance, it seems doubtful whether the beds used for the treatment of the chronic case could be the treatment of a number of young persons with disease "in succession." It is just these early which respond well to a strict and prolonged ne of bed rest, with or without associated collapse apy. It is apparent from the average type of case itted to hospital or sanatorium that not all physicians e with Dr. Stradling's selection of cases; in fact, imes one wonders if the available beds are not idered by some to be for the use of the homeless and rable. We do not think the bed position would be tly improved by giving the chest-clinic physician ect control" of all beds. We think the answer n closer coöperation between the hospital and sanam physician on the one hand, and the clinic physician he other. Let the first have his outpatient departt where he can see old and new cases, diagnose. , and follow them up, and let the clinic physician beds in hospitals. It is impossible to expect the c physician to undertake the care of more beds and act as consultant and specialist for a population of rarter of a million or more, often spread over wide s; our Scandinavian colleagues usually serve an containing a population of about 60.000, and no tment is undertaken by the clinic. By handing some of the outpatient work to the sanatorium , the clinic physician could ease the burden upon elf, although a much greater number of physicians be needed to work an efficient service.

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[1] See *Lancet*, Aug. 21, p. 298.

[2] Barton, M., Walker, K., Wiesner, B. P. *Brit. med. J.* 1945, 1, 40.

[1] Wicksteed, P. H. Common Sense of Political Economy. Lo

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Collapse treatment in the patient's home can play an portant part in shortening the waiting-list, as has ready been observed.[1] It can be started in the home not ly in cases with minimal disease but also, without undue k, where the disease is moderately advanced, whether ilateral or bilateral, especially when the patient's erves seem nearly exhausted. A few weeks or months preliminary rest in bed will point the way to be llowed in treatment. The patient with bilateral sease still suitable for collapse therapy can have at least one pneumothorax successfully established while waiting for admission: once admitted, if in need of major surgery for his other lung, he may need only a short spell for detailed investigation before he is ready for operation.

Perhaps the greatest difficulty in carrying out domiciliary collapse therapy lies in picking the right type of patient. So far, I have done about 30 inductions in patients' homes. Among the criteria I consider of major importance are: the X-ray appearance, the patient's attitude to the prospect of protracted rest in bed, his temperament, and finally the home conditions. The X-ray appearance should be such that the success of collapse therapy appears probable: and before induction the patient must have stayed in bed for at least 1–2 months. To check on this, I usually visit the house a few times without previous warning; generally speaking, the patient must be a "collaborator." At his home the patient should have at least somebody in the house to prepare his meals and be at hand. Sympathetic guidance may often help to create more tolerable conditions in the house.

The success of any treatment depends materially on the patient's morale, especially when treatment is lengthy. Now that the value of collapse therapy is generally known, it is difficult to persuade a patient that all he needs is rest in bed at home for 6 months or longer. Treated in this way, his morale may have vanished long before he is admitted to sanatorium—and with it his prospect of a favourable prognosis. We are all agreed that the ideal place for this therapy is the sanatorium, but while reaching for the desirable we must not by-pass the attainable. The acceptance of Dr. Stradling's suggestion regarding continuity of treatment would foster domiciliary collapse treatment.

City of Leeds Health Clinic. HERMANN GRUNWALD.

MEDICAL USES OF POLYTHENE

SIR,—Let me congratulate Dr. Farquhar and Dr. Lewis (Aug. 14) on their description of a technique which is, as they claim, a definite advance in intravenous therapy. Ureteric catheters have, of course, been used in somewhat similar fashion for many years with varying degrees of success. I would be interested to know what means they adopted, apart from splintage of the proximal flexures, to prevent the normal posture of flexion of the infant, particularly in the arms, stopping the flow of fluids by kinking the veins.

However, before Bateman's and similar cannulæ are discarded one might point out that very successful intravenous therapy is possible with them; in the gastroenteritis unit at this hospital many "cut-downs" have lasted for seven days or more with minimal phlebitis, and one, regarded as somewhat of a record, ran for fourteen days with very little venous reaction.

That the elimination of trauma to the vein, apart from the initial insertion, is important is well shown by the readiness with which a phlebitis will occur in a restless infant, as distinct from the placid or flaccid one. Other factors are of considerable import, such as the substances used for transfusion or infusion and the avoidance of unnecessary interference and infection; but I have always been impressed by the need for adequate and secure splintage, and for sedation of the very restless infant when rigid cannulæ are used. The flexible catheter reduces this factor to a minimum.

My main object, however, is to plead for a more general adoption of a technique which appears to be the routine in most trans-Atlantic units and in some Continental ones—that of direct venepuncture. The success with which this method is practised depends mainly on the environment and the enthusiasm with which it is fostered. Following the advent of a Canadian lady for a tour of duty on our gastro-enteritis unit, for some months over 50% of all intravenous infusions were done by this technique. As an example, one infant, the severity of whose illness necessitated continuous intravenous therapy for 28 days, left hospital with only one "cut-down" scar. One of these "stab" drips has run for nine days, at an average rate of a litre daily, taking various fluids including 5% glucose, Darrow's solution, blood, and plasma. For the actual venepuncture, selected hypodermic or small intramuscular needles can be used;

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[1] Maclean, A., Gemmill, J. S. *Lancet*, 1948, i, 173. Pritchard, E. K. *Ibid*, p. 302. Stradling, P. *Ibid*, Aug. 21, p. 311.

short-bevel needles are better retained in the vein but are often difficult to insert. The Frankis Evans type of double needle has particular advantages. The veins of election are those of the dorsum of the hand and foot, but the radial, antecubital, and long saphenous veins can occasionally be used in an infant without much adipose tissue. Adiposity is the biggest obstacle to successful venepuncture as the vein cannot then be readily seen or palpated. The largest needle that can successfully be inserted in the vein is naturally the one of choice. The method of securing the needle and of splintage are of great importance. The main advantages of this technique are that the vein more readily re-canalises; there is much less phlebitis and periphlebitis; wound infection cannot occur since there is only a needle puncture; no scar results; and veins which may be of vital value to an infant can be spared.

Finally, I cannot agree with the writer of the section on intravenous therapy in a recent pædiatric textbook that "it is practically always necessary to cut down on the vein in children younger than five years." Surely we should make it an accepted principle in our pædiatric units that direct venepuncture is the method of choice in every child unless there are definite reasons to the contrary.

Queen Elizabeth Hospital for Children,
London, E.2.
B. McNicholl.

SIR,—With reference to the most interesting article by Dr. Farquhar and Dr. Lewis, for some time I have used polythene tubing in the treatment of varicose veins, inserting it up the saphenous vein after doing an "ankle tie." It has just the right resistance and it is far more practical and very much cheaper than ureteric catheters, which require special sterilisation and deteriorate rapidly after being used once or twice.

London, W.1.
R. Rowden Foote.

PROFESSIONAL SECRECY AND VENEREAL DISEASE

SIR,—I write in support of Sir Ernest Graham-Little and Miss Hardwick (Aug. 14). I am confident that the promise of secrecy, contained in the original V.D. scheme, encouraged patients to attend a clinic and—of equal importance—to continue under treatment. The original scheme, which resulted from Sir Malcolm Morris's energetic campaign, produced a steady decrease in the incidence of syphilis throughout the inter-war years; the L.C.C. returns record 8118 new cases in 1921 and only 2864 in 1938. It would be lamentable if such progress should be jeopardised by the new decree. Nor should we forget the honourable tradition of our profession, not to divulge what we see and hear in connexion with our professional practice.

London, W.1.
Henry MacCormac.

SALARIES IN GOVERNMENT SERVICE

SIR,—The Spens report on the remuneration of specialists and other whole-time hospital medical officers suggested that clinical work should be remunerated more fairly than in the past when higher salaries meant diversion to administrative work.

The Ministry of Pensions has reviewed the salaries of hospital medical officers and has just notified them individually of the new scales. The notification received by me does not indicate whether any increments will be allowed in future years. Nor has any provision been made for superannuation, for the Ministry stays out of the National Health Service and is not bound to accept the principles of the Spens report.

I have been employed for some years at the maximum rate of £550 per annum (plus £100 living-out allowance and £90 consolidation allowance, making a total of £740). I have reached this by annual increments (which had to be requested) from the starting salary of £350, and was informed on application in recent years that the Ministry did "not usually pay more." My new salary has been consolidated at £890 per annum.

This information may enable hospital medical officers not employed by the Ministry of Pensions to obtain some idea of their new salaries.

"Temporary" Medical Officer.

THE ALCOHOLIC

SIR,—It was instructive to read how your contri (Aug. 7) broke away from alcohol with the aid of holics Anonymous. Yet, few addicts are capable performing such a feat unless medicine has paved way; it is in aftercare that Alcoholics Anonymous This is no mean division of labour: patients stand or by the aftercare they receive, and doctors cannot prov it. What doctors can provide in the way of treatm may be seen from Dr. J. P. Henderson's[1] personal acco of alcoholic craving; a more fitting complement to y contributor's story would be hard to find.

Falmouth.
H. Pullar-Strecke

M.R.C.P. EXAMINATION

SIR,—The opinion is indeed widely held that M.R.C.P. is no longer a clinical examination of h standing. This viewpoint would appear to be justi for two reasons: (1) the results of the examination h become notoriously unpredictable, and (2) no candid is required to have done any clinical work. The c regulations with which a candidate must comply some curiously applied rules relating to the prim qualification. The large number of prospective c sulting physicians obviously makes the introductio detailed regulations essential.

The success of even a small proportion of rece qualified doctors who cannot possibly have acquired necessary experience certainly discredits the examinati The numbers who take it "on spec." and find themse on the pass list must be embarrassingly high.

Since the era of the general physician is passing nearly every would-be consultant ultimately speci in one or other of the branches of medicine, we wo whether the London college has considered adopti plan such as that of the Edinburgh membership.

For this examination a candidate must be qualified for years and in addition to "the principles and practic medicine" must offer a special "department of medicine in which a high standard of proficiency is expected." of the two sections of the examination consists of (1) pap (2) a series of short cases in the form of a ward-round and a case for written commentary, with a "clinical-oral on d nostic methods" such as X rays, cardiographs, histolo slides, clinical specimens, &c.; and (3) an oral examina

A test such as this has several advantages. It is and therefore can be thorough. It greatly reduces element of chance. The examination in the proficiency subject is especially attractive to those y enthusiasts who are beginning to pursue their life's interests. One modification, however, which w enhance further the status of the examination woul the extension of the required period after qualifica to three or more years, part or all of which shoul spent in recognised appointments.

M.R.C.P. LON
M.R.C.P.E.

DEATH WHILE BATHING

SIR,—There has often been uncertainty about the real cause of deaths whilst bathing. Those who ha recovered from an attack which apparently would ha caused their death had it occurred while swimming deep water can help to throw light on the subject, Dr. Alexander[2] has done. Zum Busch's[3] account his own experiences suggests that a kind of giant-urticar and faintness following sudden immersion in cold wat may both be explained in the same way, the gia urticaria being due to the release of a histamine-li substance in the skin and subcutaneous tissue, which, too much gets into the general circulation, may cau fainting.[4] A popular summing-up of the histamine p of the subject is given by Langdon-Brown[5]:

> "Every known protein contains . . . histidine. Bre off a single CO_2 molecule from this histidine, and it becom

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1. *Brit. J. Inebr.* 1944, **42**, 44.
2. Alexander, G. L. *Lancet*, Aug. 21, p. 312.
3. Zum Busch, J. P. *Dtsch. med. Wschr.* 1933, **59**, 15.
4. Horton, B. T., Brown, G. E. *Amer. J. med. Sci.* 1920, 178, 1
5. Langdon-Brown, W. *Camb. Univ. med. Soc. Mag.* 1932, 10,

a powerfully toxic substance, histamine. This substance when liberated from the tissue cells can produce all the phenomena of allergy. The chemical basis of allergy is therefore simple . . . but the factors which lead to the liberation of this substance are almost as varied as life itself. Histamine was originally isolated by Barger and Dale from ergot in 1910, and then from the intestines. If it is applied to the human skin, it promptly raises an urticarial wheal; if injected intravenously into animals, it produces a condition like anaphylactic shock. . . . The problem is, how does a substance which is toxic to everybody become liberated only in the tissues of certain people, in answer to stimuli which are quite harmless to everyone else."

um Busch would probably have died had he been in p water at the time of a severe attack. There is a d deal of scattered literature on similar severe tions following sudden immersion in cold water. Goebel[6] relates his personal experience, when he nearly drowned while swimming in water which was cold, on a warm summer day. The accident occurred, ever, soon after the midday meal, and may have n connected with his stomach being full.

ondon, W.1. F. PARKES WEBER.

PPOINTMENTS AND POLITICAL ACTIVITIES

IR,—In the official document "Appointments as mber of a Medical Board Panel under the National urance (Industrial Injuries) Act, 1946" the following tence occurs at para. 5: "In view of the judicial ure of the statutory functions assigned to medical rds under the Act, members are asked to notify the ional medical officer of the Ministry if they play, or end to play, a prominent part in politics." I ther that they will then be called on to resign their pointments.

I submit that the survival of democracy depends on e political activity of its intelligent members.

BELSEN.

MEDICAL RECORDS

SIR,—I should like to support "Medical Secretary's" ea (Aug. 14) for special training for those wishing to come medical stenographers. As medical superintendent of a hospital, I have had to train four shortnd-typists in the last seven years. I personally ctate all the discharge reports and outpatient reports, d the tremendous amount of time wasted in spelling t medical terms, quite apart from the resultant fraying tempers, has to be experienced to be believed.

My present secretary fully agrees with me that there ould be some course of instruction for would-be edical stenographers. When she took up her appointent with me she had had considerable experience in y stenography in the local council offices, and it was lling to her to find her speed reduced to a mere trickle wing to the necessity of getting words spelt, or of oking them up in the medical dictionary.

I have no personal knowledge of the "notorious neanness" of doctors when it comes to paying their cretaries, as I have worked in hospitals all my qualified ife; but I do know that local authorities are slow to ecognise financially the extra application required of nedical stenographers. My secretary receives no more pay than girls with the same number of years' experience n the central office, where the work is purely lay; and et she has to carry in her head details of the spelling of undreds of abstruse medical terms.

I have lately begun to train a new outpatient clerk. nd am feeling to the full the difference between one rained in the use of medical terminology and one who is ot; whereas I am able to dictate my inpatient disharge reports with an average amount of pleasure, I pproach the dictation of my outpatient reports with a eeling of misgiving which very shortly becomes xasperation.

I feel sure that if only they would take the trouble to rite to you, most doctors would endorse the need for uitably qualified stenographers.

MEDICAL SUPERINTENDENT.

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6. Goebel, O. *Dtsch. med. Wschr.* 1934, 60, 982.

Obituary

JOHN KAY JAMIESON

M.B. EDIN., LL.D. LEEDS, M.A., CH.M. DUBL.

Prof. J. K. Jamieson, who successively held the chair of anatomy in the University of Leeds and at Trinity College, Dublin, died on Aug. 20, at the age of 75.

He was born in Shetland, the fourth son of Robert Jamieson of Sandness; and E. B. Jamieson, the Edinburgh anatomist, is one of his brothers. From Madras School, St. Andrews, he went to the University of Edinburgh, where he qualified M.B. in 1894. After holding a demonstratorship in anatomy at Surgeons' Hall in Edinburgh he took up the same post in the University of Leeds under Wardrop Griffith, whom he succeeded in the chair in 1910. During the 1914–18 war, as deputy dean of the faculty of medicine, he proved himself as an administrator and the twenty years of his deanship which followed was a time of notable expansion for the faculty especially in the departments of pathology and physiology. From 1928 to 1936 he was also a member of the General Medical Council, and he acted as examiner for the universities of Edinburgh, Aberdeen, Liverpool, Manchester, Sheffield, Bristol, Dublin, and Belfast.

In 1936, when he had almost reached retiring age, Jamieson was appointed to the chair of anatomy at Trinity College. The intention was that he should retire in 1943 at the age of 70, but conditions that year were unfavourable for the appointment of a successor, so, despite failing strength, shortage of staff, and scarcity of fuel he carried on until last summer. Even then he was not immediately granted a respite, for his successor was unable, through illness, to take up his duties in October and Jamieson continued as acting professor until last December.

Of these years in Dublin J. W. B. writes: "It would not have been easy for anyone to maintain the reputation of a department of anatomy which had had at its head three such men as Alexander Macalister, D. J. Cunningham, and A. F. Dixon, but we asked Jamieson to do something more difficult than that—to break the tradition of the department. Dixon had maintained, unaltered, the Edinburgh tradition which he had inherited from Cunningham, a tradition which was excellent when medical students were given training in little except anatomy in preparation for their clinical work but a tradition which, in the opinion of the younger members of the staff of the school, had outlived its utility. So it fell to Jamieson to reduce the duration of formal teaching in anatomy from eight terms to five and to prove that, while a course of this length might be inadequate for the training of an anatomist, it was adequate for 99% of medical students. No young and inexperienced man and no-one whose reputation had not already been established could have succeeded as well as Jamieson did in this difficult task.

"Jamieson taught form and function and never failed to point out not only what was important in relation to clinical work but also why it was important. His lectures were always interesting and often entertaining, but it was in informal teaching in the dissecting-room that he excelled. There he might be found at any hour of the day, surrounded by a group of eager students each of whom he knew as an individual, dissecting and demonstrating, teaching the dull to use their brains and the clumsy their fingers. He inspired both respect and affection in his students: he never forgot a student whom he had taught and no student ever forgot him.

"The staff of Trinity College changes more slowly than that of most universities and does not readily take to its heart a newcomer. But Jamieson, who had often acted as external examiner, was never regarded as a newcomer. His ability, his honesty of purpose, his sound common sense, his dependability, his wide knowledge of the classics and of English literature, all gained him the respect of his colleagues, but Jamieson gained something rarer than that—their affection. Those he met were first attracted by his little mannerisms, his learning so modestly displayed, his impish sense of humour, his kindness of heart, and, almost before they were aware of it, acquaintance had blossomed into friendship. When he gave—as he so generously did—friendship, he gave it for life. It was kept alive by meetings at long intervals and by his letters, which deserved leisure to read, not because his writing was crabbed or difficult, but because he packed so much into a couple of pages. During the war many widely scattered friends blessed him for the pleasure his letters gave. No doubt others will worthily take the place of Jamieson the great teacher of anatomy, but we cannot hope that anyone will fill the place left vacant in the life of the College by our friend Jimmy."

As a friend of thirty-seven years' standing J. C. B. adds: "Jamieson was a man whose arresting personality, instantly impressive to all on first contact, became a tradition in his own lifetime. When he appointed me his demonstrator, in the second year of his professorship at Leeds, I knew at once that I had acquired a friend as well as a chief; and experience amply proved that beneath a rather forbidding exterior, he imperfectly concealed an inherent kindliness that broke out in unexpected ways and places. Thus to many he had long been known by the revealingly affectionate name of 'Jamie.' With startling exceptions, he had little use for the conventions and conventional procedure. There was an impish quality about all his doings, sometimes disconcerting to his friends and colleagues; and it was a secret delight to him—sometimes not so secret—that he was thought by some to be Machiavellian in his methods. In an old letter, after recounting his reasons for accepting a post offered to him, he goes on: 'The first reason is childish though respectable: the other reasons savour of a life of intrigue. Now, I ask you, am I a crafty and devious person? This will put you up against it to frame an agreeable answer.' But, as a man of affairs, he certainly knew his business, and more often than not got his own way because it was the best way. He had the most penetrating judgment of men and their motives, and his advice, in private as well as in public matters, was always shrewd and solid.

"As a teacher of anatomy Jamieson's reputation was early established and stood high. His practical and characteristically fresh outlook on topography made his lectures and demonstrations occasions to which students looked forward; and they seldom failed to obtain from them ideas and what he himself called 'notions' that stimulated thought and discussion. His main original work—on the surgical anatomy of lymphatic areas in collaboration with the late Mr. J. F. Dobson—has stood the test of time. They employed Gerota's method of injection, and they published, as the fruit of much time-consuming labour, a series of papers, notably on the lymph-drainage of the tongue, stomach, and large intestine, that are now classical. Their principal illustrations of these organs are well known, as inevitably they found their way into the standard textbooks. It is to be regretted that Jamieson—immersed in affairs as he became—did not find time to carry out his intention to incorporate all their results in a volume which certainly would have worthily filled the gap that still exists for a work in English on the lymphatic system.

"Jamieson was an indefatigable and lively correspondent, and doubtless many of his friends possess and have been re-reading collections of his letters—informative, amusing, gossipy, often cryptic and not infrequently pungent in their comments on local and other affairs. In his later years, disabilities, which he had long suffered almost gladly, prevented him enjoying his regular round of golf; but that too became matter for amusing comment and, in spite of the increasing burden, his natural resilience appeared to be almo unabated. By his pupils, his colleagues, and his friends John Kay Jamieson will always be gratefully remembered as a notable and remarkable figure, whom to have known has indeed been a liberal education."

Professor Jamieson married Elisabeth, daughter Dr. R. P. Goodworth. She died in 1936 and they leav a son and a daughter.

JAMES ERNEST HELME ROBERTS

O.B.E., M.D. LOND., F.R.C.S.

Mr. J. E. H. Roberts, consulting surgeon to S Bartholomew's Hospital, and emeritus surgeon to th Brompton Hospital, died at his home at Ottershaw o Aug. 25.

Roberts was educated at King Edwards' Scho Birmingham, and St. Bartholomew's Hospital, where h qualified in 1906, graduating M.B. with honours in surge two years later, and taking the F.R.C.S. in 1909. Aft holding house-appointments at St. Luke's Hospital an at Great Ormond Street, he became demonstrator i surgical pathology and chief assistant surgeon in th outpatients department at Barts and later surgica registrar and chief assistant in the orthopædic departmen In 1919 he was elected assistant surgeon and in 1933 h was appointed to the full staff. He was also surgeon t the East London Hospital for Children.

During the first world war, during which he serve with distinction, holding the rank of major and bei thrice mentioned in despatches, he became interested i thoracic surgery. In 1919 he was appointed to th Brompton Hospital, and from this time his main energie were directed to this branch of surgery, to which he mad considerable contributions, notably in the treatment o acute and chronic empyema. Roberts was the first t use active negative-pressure suction in these condition and his operation for the closure of old chronic empyem cavities has become the most efficient method at ou command. His early reviews of one-stage lobectomy published with the late H. P. Nelson, were a milesto in intrathoracic work.

A good teacher, he gathered a group of enthusiast men around him, encouraging the younger men to furth the work he had already done. One of these young colleagues writes: "Those of us who knew Roberts i his later years respected, admired, and liked him for h pioneering spirit and for the rugged strength of h personality. When he joined the staff of Bromp Hospital surgery of the chest was practically confined t the drainage of empyema, and it was no easy task for t young surgeon to persuade his colleagues to try tho operations which his experience in the 1914–18 w had suggested. No-one will ever know how much w owe to Roberts and how many of the operations whi are now commonplace were the result of his pioneer wor His inquiring scientific mind enabled him to work o his techniques on a sound mechanical basis, and he w never happier than when arguing with the physiologis and applying their principles to his work. No surge ever worked more thoughtfully. He also had uniq powers of observation, and those who went round th wards with him could not fail to be impressed by h clinical judgment; they always came away with som practical point to remember. Above all, Roberts was fighter; his ideas were not always popular but h pursued them with courage and with a dry sense humour which endeared him to his friends. He nev avoided criticism, and was always prepared to produ a closely reasoned argument. All his friends will rememb the backward tilt of his head and the triumphant twink in his eyes as he scored his point."

Roberts's interest in the scientific aspect of surger was shown by the variety of scientific bodies with whic he was associated. As one of its earliest presidents h gave the Society of Thoracic Surgeons considerab impetus, and more recently, from the chair of the Tube culosis Association, he showed how admirably medici and surgery could be blended in one person. To th Medical Society of London, over which he had al presided, he delivered in 1935 the Lettsomian lectures he surgery of pleural and pulmonary infection. A member of the International Association for Surgery, he was also a foreign associate of the Société Belge de Chirurgie, and an honorary fellow of the American Association of Thoracic Surgeons and of the Polish Society of Surgeons of Warsaw. A valued member of he Standing Advisory Committee on Tuberculosis from its nception to the time of his death, his advice on the surgical ontrol of this problem was of the utmost importance.

With all his medical activities, he still found time for ther interests, and he became a recognised authority n dragonflies and alpine plants. Till the beginning of he late war his holidays were spent in the Alps, and at is home he had a superb collection of these plants. P. T., to whom we are indebted for much of this memoir, adds: "Roberts was often brusque, almost to he point of rudeness, but those who knew him well ully appreciated the kindness which underlay his rusqueness. His apparent offhandedness could be ttributed to his absent-mindedness: it was possible o talk to him for a considerable time without his being ware of it, and only persistent effort could break into hese absent-minded periods. Once his attention was ngaged he gave himself wholly to the matter in hand. All those who were privileged to know him will regret he passing of a loyal friend."

Another colleague, paying tribute to Roberts's contribution to chest surgery, continues: "His sanatoriums will sadly miss his regular visits which, though not always starting exactly at the appointed hour, were demonstrations of expert craftsmanship larded with ntervals in which words of real wisdom and experience mingled with cigarette smoke. In debate or discussion his comments could be trenchant, but to the individual—and particularly to his juniors—he was invariably kind and helpful, and behind his reserve he was a most charming and gracious companion."

Mr. Roberts married Coral, daughter of the late Captain J. A. Elmslie, R.N.R., who survives him.

PERCY ROYCROFT LOWE

O.B.E., B.A., M.B. CAMB.

Dr. P. R. Lowe, formerly president of the British Ornithologists' Union and chairman of the European and British section of the International Committee for the Preservation of Birds, died on Aug. 18 at the age of 78. For many years he was in charge of the bird room of the British Museum (Natural History).

From Jesus College, Cambridge, he went to Guy's Hospital, where he qualified in 1897. After holding house-appointments at Leicester and Derby he went to South Africa in 1899 as one of the six civil surgeons chosen by the War Office to serve in the South African War. While medical officer in charge of a hospital train he began his collection of birds, and on his return from South Africa he was able to continue this work while acting as private physician to Sir Frederic Johnson, with whom he visited the West Indies. His collection of island forms of birds made during these voyages is now in the British Museum. During the 1914–18 war Lowe again commanded an ambulance train and for his services he was appointed O.B.E.

In 1918 his appointment as keeper at the British Museum enabled him to devote the rest of his life to ornithology. His work for the preservation of wild fowl was recognised by the award of the Swedish Verner von Heidenstam gold medal in 1939, and his researches in bird anatomy and classification by the Salvin gold medal in 1946. He also represented the Government and the Home Office at various ornithological congresses on the Continent.

A colleague writes: "A man of great charm and of fundamental kindliness, Dr. Lowe would take any amount of trouble to help anyone, and he was always ready to encourage those younger and less knowledgeable than himself. As a chairman his tact, sense of justice, and ability to see another's point of view, won the love and trust of his colleagues of other nations. Though ornithology was Dr. Lowe's chief interest he was a botanist of no mean order and his delight in finding a new plant never waned."

Notes and News

PRIVATE PRACTICE FROM HEALTH CENTRES

In answer to an inquiry concerning a proposed experimental health centre at Stechford, Birmingham, the Minister of Health has informed the local executive council that doctors will not be allowed to treat private patients at centres set up under the National Health Service Act. The *Times* (Aug. 31) reports that the general-purposes committee of the council is seriously concerned at this ruling, and will recommend, at the first annual meeting of the Executive Councils Association, in London on Oct. 7, energetic measures to reverse the Minister's decision. A draft resolution to be submitted to the association expresses the view that if this decision is not reversed, it may be impracticable to operate health centres.

OPHTHALMIC PRESCRIPTIONS

The method of writing an ophthalmic prescription generally accepted in this country and in the U.S.A. is:

Right Eye: Sphere.......... Cylinder..........
Left Eye: Sphere.......... Cylinder..........

A large firm of optical manufacturers points out that some doctors now practising in this country make out prescriptions in the reverse way, writing the cylinder before the sphere, and the left eye before the right. Often these prescriptions are passed on to manufacturers whose staffs are trained in the conventional method of composing them; so a large number of returns is incurred which could be avoided if all doctors adhered to the normal practice.

DEEPER AND DEEPER

The "record" of 480 ft. for deep diving put up in 1945 by Arne Zetterstroem (*Lancet*, 1945, ii. 292) has been beaten by Petty Officer William Bollard, who reached a depth of 535 ft. in Loch Fyne on Aug. 28 (*Times*, Aug. 30). This dive was made in an Admiralty flexible deck diving-suit, and, in view of the fact that Zetterstroem died on the way to the surface, it is not surprising that Bollard, though he reached 535 ft. at 9.29 A.M., was not allowed out of the decompression chamber until 4.45 P.M. The previous "record" held by a diver who survived the ascent was that of Nohl, of Milwaukee, who reached 420 ft. in a diving-suit of his own invention (End, E. *J. Industr. Hyg.* 1938, 20, 513). Petty Officer W. Soper also broke the American record on Aug. 28 by diving to 480 ft. It is but fair to say that Nohl's dive was limited by the depth of water in Lake Michigan. We are not told whether Bollard reached the bottom of the loch or not.

URINE TESTING WITHOUT HEAT

An ingenious modification of Benedict's test for sugar in the urine is now available, in which no external heat is required. The test, known as 'Clinitest,' is carried out by placing five drops of urine plus five drops of water in a test-tube. One clinitest tablet is then added, a few seconds allowed to elapse for the reaction to occur, and the colour then compared with a colour chart. The tablet contains anhydrous copper sulphate, anhydrous sodium hydroxide, citric acid, and sodium bicarbonate. About half of the necessary heat is furnished by the heat of solution of the anhydrous sodium hydroxide and about half by the heat of the neutralisation reaction between sodium hydroxide and citric acid. Clinitest, which has been approved by the medical subcommittee of the Diabetic Association, is distributed by Don S. Momand Ltd., 57, Albany Street, London, N.W.1, from whom further details can be obtained. The complete set, including bakelite case, apparatus, and reagent tablets for 36 tests, costs 12s.

MEDICAL PROTECTION SOCIETY

For this society 1947 was a year of continued success and progress, during which 1501 new members were enrolled. It was also a particularly busy year because of the large number of questions about the new health service. In the annual report the society's solicitor comments on the growth in the number of needles broken during injection. In each instance where a metallurgist's report has been obtained a flaw in the metal has been found; but a word of warning is added on the adverse effect of iodine on steel. The society recently dealt with a case where a needle had broken because of pitting caused by iodine, in which it had been immersed for only a very short time. "It is most important that practitioners should realise that iodine should not be used in connection *with injections and that stainless steel needles should be* kept away from all contact with iodine." The solicitor also remarks on the extraordinary increase, compared with pre-war years, in cases of fractured jaw due to tooth extraction. The council's decision to keep the annual subscription at £1 is a tribute to the health of the society's finances, for the annual cost per member has risen from 15*s.* 4*d.* in 1945 to £1 3*s.* 3*d.* last year. This *increase is attributed to rising costs in general,* and in particular to the award of much heavier damages by the courts.

J.A.M.A.

British readers of the *Journal of the American Medical Association* have been glad to see in the issue for Aug. 7, the latest to reach us, that the journal's printing troubles have ended.

University of Leeds

Prof. J. W. McLeod, F.R.S., is to succeed Prof. Matthew Stewart as dean of the medical faculty. Professor Stewart is retiring owing to pressure of other work. He has been academic subdean since 1923, and dean since 1941.

Prof. W. E. Le Gros Clark, F.R.S., is to give the *inaugural* lecture of the faculty of medicine at the University Union on Tuesday, Oct. 12, at 3 P.M. He has chosen as his subject Intellectual Adventure.

University of Aberdeen

Mr. W. O. Kermack, D.SC., F.R.S., has been appointed to the new MacLeod-Smith chair of biological chemistry. Dr. Kermack has been director of the chemical department of the research laboratory of the Royal College of Physicians of Edinburgh since 1921.

Royal College of Physicians of London

Dr. F. M. R. Walshe, F.R.S., will deliver the Harveian oration at the college, Pall Mall East, S.W.1, on St. Luke's day, Monday, Oct. 18. He is to speak on the Structure of Medicine and its Place among the Sciences.

Society of Apothecaries of London

Ten postgraduate lectures on modern therapeutics will be delivered in the hall of the society, Black Friars Lane, E.C.4, from Oct. 18 to Nov. 5. Further particulars will be found in our advertisement columns.

Institute of Laryngology and Otology

On Tuesday, Sept. 7, at 9.30 A.M., at the institute, 330, Gray's Inn Road, London, W.C.1, Mr. Myles L. Formby will give a lecture on Non-operative Treatment of Maxillary Sinusitis.

Tuberculosis Course

A refresher course for doctors on the treatment of non-pulmonary tuberculosis including lupus will be held at Lord Mayor Treloar Cripples' Hospital, Alton, Hants, from Oct. 5 to 7. Further particulars may be had from Dr. Harley Williams, N.A.P.T., Tavistock House North, London, W.C.1.

Congress of Obstetrics and Gynæcology

The *twelfth British Congress of Obstetrics and Gynæcology* will be held from July 6 to 8, 1949, in the Friends Meeting House, Euston Road, London, N.W.1, under the presidency of Sir Eardley Holland. Subjects already chosen for discussion include: Modern Cæsarean Section (opener, Mr. McIntosh Marshall); Essential Hypertension in Pregnancy (Prof. George Pickering and Prof. F. J. Browne); Diagnosis and Prognosis of Carcinoma of the Uterus (Dr. J. E. Ayre and Dr. F. G. Spear); and Maternal Mortality. The hon. secretaries would like to have the names of those who hope to attend not later than March 31.

Whitley Councils

Some of the Whitley council machinery described in our issue of May 29 (p. 845) is now in being. The general council, *which will deal* with questions affecting more than one group of workers, has not yet been established, but of the functional councils covering the different classes of people engaged in the health service the following have been or are being set up: optical, pharmaceutical, nurses and midwives, professional and technical grades (two councils, A and B). The membership of the medical and dental councils is still being discussed with the organisations concerned.

Edinburgh Post-Graduate Board for Medicine

On Friday, Sept. 10, at 3.30 P.M., in the anatomy theatre of the university, Dr. W. Ritchie Russell will sp on Localisation of Cerebral Function.

North West Metropolitan Regional T Society

At a meeting of this society to be held on Oct. 6, at 4.30 at Colindale Hospital, N.W.9, Dr. H. M. C. Macaulay will o a discussion on the development of the tuberculosis serv in the region.

Supplies of Diphtheria Antitoxin

Stocks of diphtheria antitoxin are now held by a pharmacists and by infectious-disease hospitals. In cent where these hospitals are not readily accessible, the of Health has arranged for a small supply to be kept at convenient general hospital.

Medical Films

The three morning film shows organised by the S Film Association in connexion with the international film congress will be held on Oct. 8 and 11 (cf. p. 360 of issue of Aug. 28) at the Royal Society of Medicine, and Oct. 9 at 1, Lambeth High Street, S.E. Applications admission should be addressed to the organiser at 34, Square, W.1.

Corrigendum.—The English publishers of Sulfonami and Allied Compounds, by Dr. E. H. Northey, reviewed *our issue of Aug. 7 (p. 220), are Messrs. Chapman* and and the price is 75*s.*

Appointments

Hayward, G. W., M.D. Lond., F.R.C.P.: physician for disease the heart, Southend-on-Sea General Hospital.

Matheson, J. G., M.B. Aberd., D.A.: specialist anæsthetist, Ro Edinburgh Hospital for Sick Children.

Morgan, N. H., O.B.E., F.R.C.S.: asst. orthopædic surgeon, De group of hospitals.

Price, D. E., M.B. Lond.: pathologist in the Home Office.

Births, Marriages, and Deaths

BIRTHS

Bevan.—On Aug. 21, at Kyperounda, Cyprus, the wife of Dr. C Bevan—a daughter.

Birt.—On Aug. 25, at Godalming, the wife of Mr. St. John F.R.C.S.—a son.

Borland.—On Aug. 22, at Sunbury-on-Thames, the wife of A. K. Borland—a daughter.

Carter.—On Aug. 24, in London, the wife of Dr. F. S Ca —a son.

Cookburn.—On Aug. 21, at Selsdon Vale, the wife of Dr. H Cookburn—a daughter.

Denham.—On Aug. 22, the wife of Captain Robin Denham, R.A —a son.

Hallett.—On Aug. 27, at Lymington, the wife of Mr. Geoff Hallett, F.R.C.S.—a daughter.

Kennedy.—On Aug. 20, at Penarth, South Wales, the wife Dr. Michael Kennedy—a son.

Loughborough.—On Aug. 20, at Gosport, the wife of Dr. Jo Loughborough—a son.

Murphie.—On Aug. 28, *in London, the wife of* Mr. C. I. Murph F.R.C.S.—a daughter.

Solomon.—On Aug. 26, at Orendon, Bucks, the wife of Dr. R. Solomon—a son.

Wadia.—On Aug. 23, in London, the wife of Dr. Richard Wa —a daughter.

Waugh.—On Aug. 24, in Edinburgh, the wife of Dr. I. G. Wa —a son.

MARRIAGES

Dickinson—Carnegie.—On Aug. 24, at Baswich, Staffs, Jame Dickinson, M.B., to Ailsa Margaret Carnegie.

Ross—Wilson.—On Aug. 26, at Arbroath, James McLean Ro M.B.E., F.R.C.S.E., to Kathleen Margaret Wilson.

DEATHS

Brogden.—On Aug. 27, at Maybury, Woking, Surrey, Geo Alexander Brogden, M.A. Camb., M.D. Edin., aged 78.

Burton.—On Aug. 23, at Frodsham, Cheshire, William Edw Burton, M.R.C.S., D.P.H., J.P., aged 82.

Carver.—On Aug. 25, 1948, at Sutton Courtenay, John Robert Carver, M.D. Camb., D.P.H.

Lowbury.—On Aug. 24, in London, Benjamin William Lowbu M.D. Berlin.

Roberts.—On Aug. 25, at Ottershaw, James Ernest Helme Robe O.B.E., M.B. Lond., F.R.C.S.

Young.—On Aug. 28, at Tavistock, Augustus Henry Owen You L.R.C.P.I., lieut.-colonel, R.A.M.C.

MODERN PHONOCARDIOGRAPHY

G. E. Donovan
M.D., M.Sc. N.U.I., D.P.H.
CAL OFFICER OF HEALTH, LLWCHWR AND GOWER; MEDICAL
PERINTENDENT, GARNGOCH ISOLATION HOSPITAL, GLAM

ODERN American practice is to record the heart ıds (1) linearly, the vibrations due to the underlying iac action being portrayed as they exist on the surface ıe chest; (2) stethoscopically, an oscillogram of the t-sound vibrations being registered as they are nitted to the ears by the orthodox acoustic stetho- ; and (3) logarithmically, to agree roughly with a etent auscultator's auditory perception of the heart s as heard through a stethoscope if the personal s are omitted.

"logarithmic" or, as it is sometimes called, the ıan audiographic" phonocardiogram is somewhat a mer. It is a phonocardiographic term and is used by me limited sense. It means that added frequency distortion h a character has been introduced into a stethoscopic cardiograph that the resultant phonocardiogram bles approximately what the auscultator using the dox acoustic stethoscope recognises as normal. This is customarily used in phonocardiography and has by probably received sufficient sanction by usage to be ted.

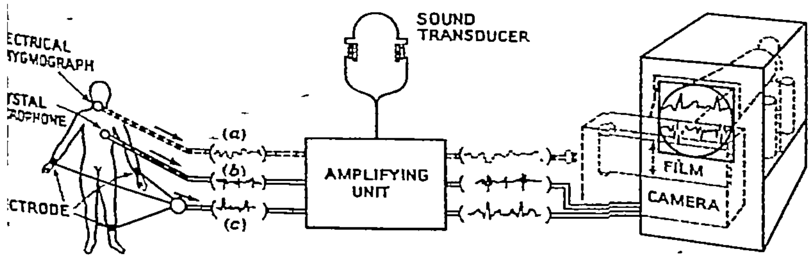
ch of these standard records can be correlated with nderlying cardiac action. There is no reason why intermediate positions should not be used, but the r, stethoscopic, and logarithmic phonocardiograms ld be the standard ones.

THE PHONOELECTROCARDIOSCOPE

ıe details of my method have already been described ıovan 1943a, b, c, d, 1944, 1945). The apparatus ists essentially of a double-channel electronic-valve lifying unit fitted with frequency controls, intensity rol, and tone-compensated volume control, a double- n cathode-ray oscilloscope fitted with a long- istence fluorescent screen, recording camera, head- ıes, and accessories such as a special crystal ophone, electrocardiographic leads, and photo- tric plethysmograph. Fig. 1 is a simplified schematic ram of the apparatus.

he apparatus permits the direct, instantaneous, ıltaneous, and constant viewing of a pair of cardiac nomena such as the phonocardiogram and electro- liogram, phonocardiogram and sphygmogram, &c., the fluorescent screen of the cathode-ray oscilloscope he patient's bedside without the necessity of photo- phic registration and consequent loss of time in eloping film. The amplified heart sounds are heard ough moving-coil headphones by one or many auscul- ors while the traces are being directly observed on the een The auditory and visual impressions can be ıultaneously compared.

Fig. 2 shows the instrument in use, with a simultaneous arithmic phonocardiogram of one cardiac area and that of another on the fluorescent screen of the double-beam cathode-ray oscilloscope as they appear for direct visual observation. The photograph had to be taken in dim light, because the exposure had to be a compromise between those required for the images on the fluorescent screen, the apparatus, and the patient.



(a) JUGULAR PULSE (b) PHONOCARDIOGRAM
(c) ELECTROCARDIOGRAM

Fig. 1—Simplified schematic diagram of phonoelectrocardioscope.

Permanent graphic records can be made by focusing the camera on the fluorescent screen of the double-beam cathode-ray oscilloscope and photographing one traverse of the pair of cathode-ray spots as they appear for visual observation—opening the shutter at the beginning and closing it at the end of the traverse of the spots. Where permanent records are desired as a routine, the traces are recorded on moving film and the spots are stationary in the horizontal axis but oscillate in the vertical axis.

The apparatus can be calibrated by injecting a small known voltage into the input of the amplifier. A transparent ruled graticule in front of the fluorescent screen assists in quantitative measurement.

Special Microphone

The microphone consists essentially of a cartridge or diaphragm crystal unit mounted in a special airtight case. The diaphragm acts as an acoustic transformer which increases the coupling between air and crystal and so increases the sensitivity. The air chamber in front of the diaphragm has an air-pressure equalising valve which connects the air of the space between the diaphragm and the patient's skin to the external air, and whose function is to protect the crystal from injury while the microphone is being applied to the chest wall. The valve is opened to allow the escape of the sudden high pressure while the microphone is being applied, but closed during the actual recording of the phonocardiogram. The chest-piece of the microphone is electrically insulated so as not to affect the registration of the electrocardiogram.

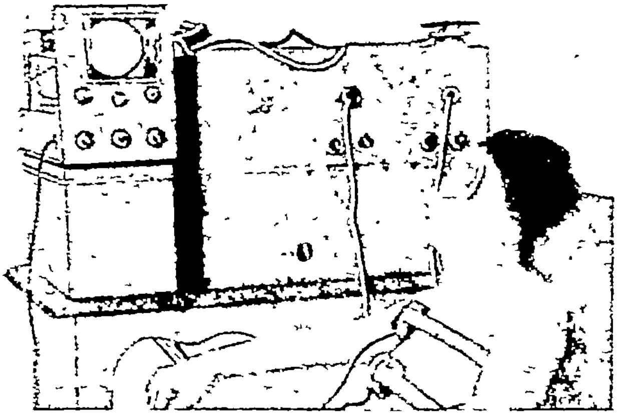


Fig. 2—Author's apparatus in use. Simultaneous logarithmic phonocardiogram of one area and logarithmic phonocardiogram of another area appear for direct visual observation on fluorescent screen.

The natural period of the piezo-electric crystal incorporated in the microphone is about 10,000 cycles per sec.; but, owing to a diaphragm being coupled to the crystal, the natural period of the combination is lowered to a few thousand cycles per sec., which is well above the upper frequency limit of 1000 cycles per sec. for phonocardiography.

The microphone is sensitive and light, has a low parasitic background noise, and, unlike the carbon

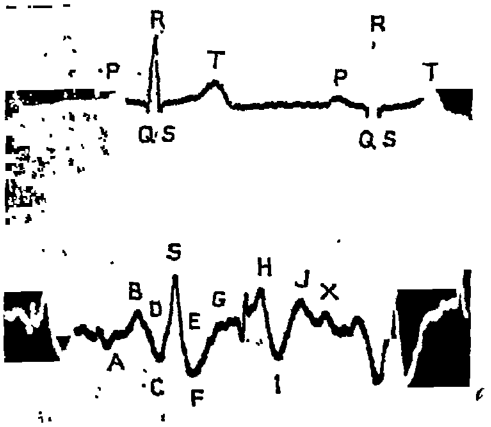


Fig. 3—Normal electrocardiogram lead 2 and jugular phlebogram (recorded by all-electric method) as they appear for direct visual observation on fluorescent screen. *This type of jugular phlebogram,* unlike electrocardiogram, demonstrates *nearly* every phase and event *in* cardiac cycle. Electrocardiogram lead 2 shows P, auricular wave ; QRS, *ventricular initial* complex ; and T, ventricular terminal wave. Jugular phlebogram shows different phases of systole and diastole : ABC, approximate duration of auricular systole (A-C interval) ; CD, *isometric contraction* ; *D,* closure of A-V valves ; S, interval of systole filled by large positive wave due to impact *from* adjacent artery ; *SE,* sharp decline at onset of systolic ejection and descent of ventricular base ; G, second heart sound ; GH, phase of isometric relaxation ; H, opening of A-V valves ; *HI, rapid ventricular* inflow ; I-X, diastasis (period of slow inflow) ; X, end-point of diastole.

microphone, is relatively unaffected by handling, since it has no loose granules. It has a suitable impedance *to* work without a transformer and does not require polarising potentials. The only type of shielding required is electrostatic.

The frequency response of the microphone is excellent for logarithmic and stethoscopic phonocardiography. The microphone's time constant is artificially increased by shunting with a 1 mF condenser in registering the linear phonocardiogram ; this enables the microphone to register such slow pulses as the jugular pulse.

Amplifying Channels

There are two separate channels of amplifications which are resistance-capacity coupled. The maximal amplification of each channel is 500,000 times, and the frequency response is flat within $\pm 7^{1}/_{2}\%$ between 0·15 and 5000 cycles per sec. Electric filters are incorporated which narrow down the frequency bands of observation to reduce the amount of extraneous and interfering variations outside the frequency range of interest. I prefer electric filters, unlike some American workers who use an acoustic high-pass filter incorporated in the case of

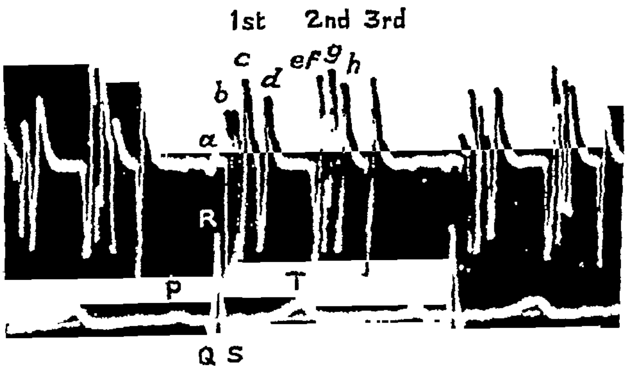


Fig. 4—Innocent triple rhythm in normal person. Record shows simultaneous stethoscopic apical phonocardiogram and lead I of electrocardiogram of a boy, aged 10 years, recorded on moving film. Stethoscopic phonocardiogram shows very well auricular complex of *first heart sound. See* text for explanation of record.

the microphone. They get various degrees of action by using four chest-pieces with such
The electric filters have the advantage that the
phone is left in situ, and it takes only a few
get 25 different combinations by rotating two

Double-beam Cathode-ray Oscilloscope

The cathode-ray tube is the most faithful medium available to the physiologist. Unlike *instruments* used for this purpose (e.g., string meter and mirror galvanometer) the moving the cathode-ray oscillograph—a stream of possesses practically no mass and is consequentl tically without inertia. It can therefore respond to the most rapid variations of potential withou damping or overshooting. It is immune from by deflectional overload. It is robust and easy to pulate. The variations can be studied in relation by using a linear time base on the horizontal plates of the cathode-ray tube.

The fact that the double-beam cathode-ray two spots (which produce a long afterglow or rescence lasting several seconds) capable of in deflection in the vertical or Y-direction while deflected simultaneously in the horizontal or from the left to the right borders of the flu screen by a common time base permits direct simultaneous, and continuous observation phenomena such as a phonocardiogram and cardiogram, or a phonocardiogram and sph The speed of the time base can be varied to sho

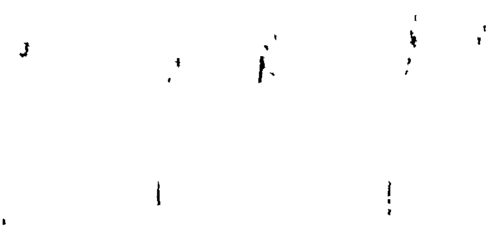


Fig. 5—Logarithmic phonocardiogram of same patient same area as in fig. 4 and accompanied by lead I of cardiogram. This type of record agrees with auditory auscultator but does not give so much information stethoscopic phonocardiogram. See text for explanation.

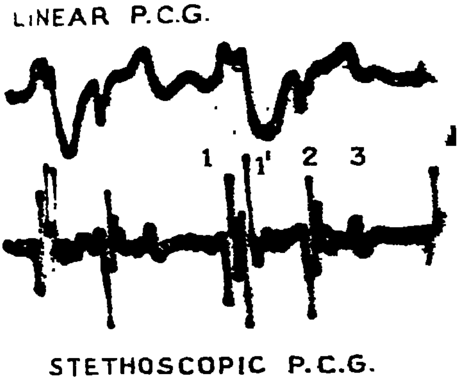
one to several heart cycles on the fluorescent scre varying the amplification of the amplifying and the speed of the time base, an expanded heart oscillogram and electrocardiogram can be seen screen.

INTERPRETATIVE TRACES

It is desirable for the interpretation of the cardiogram to have it accompanied by a simul electrocardiogram or phlebogram. The electroc is the more popular interpretative trace i country, but the phlebogram has many adv its value is being increasingly recognised, espec America.

Fishberg (1940) expresses the generally held " unfortunately to obtain a good tracing of the pulse is often a task of considerable difficulty, a interpretation of the records is frequently ob Bramwell and King (1942) say that the method is of historical interest, since most information gi the phlebograph can now be obtained in a much form with the electrocardiograph.

It must be pointed out that in many ways the cardiogram as a reference trace is not ideal, sin electrical manifestations of cardiac activity a necessarily synchronous with the mechanical event



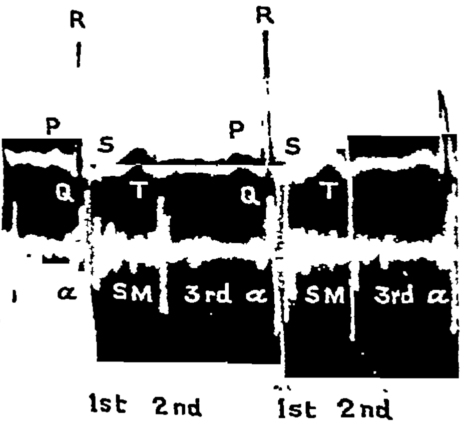
-Simultaneous linear phonocardiogram and stethoscopic phono- iogram taken over apical area as they appear for direct visual rvation on fluorescent screen, showing splitting of first heart id. For explanation see text.

ar pulse tracing with the latest technique gives thing the electrocardiogram cannot give—i.e., ianical evidence of the action of the heart chambers. a clinical method which produces a graphic record arly every phase and event during the cardiac cycle. jugular pulse trace improves the possibility of ysing the phonocardiogram.

g. 3 shows the electrocardiogram lead 2 and the lar pulse recorded with the crystal microphone, the citance of which was artificially increased by shunting ternal fixed condenser across it. This is a photograph e traces as they appear for direct visual observation he long-afterglow fluorescent screen of my apparatus. ill be seen that the phlebogram gives much more rmation than does the electrocardiogram.

his electrical method has the advantages of compara- simplicity, great accuracy, elimination of rubber ng, possibility of magnification as individually essary, and possibility of synchronisation with other es such as electrocardiograms, phonocardiograms, recorded with more or less identical electrical hods.

use the electrocardiogram as the routine interpreta- trace for the phonocardiogram, but in difficult cases refer the jugular pulse tracing recorded by an electric method.



. 7—Record of simultaneous electrocardiogram lead 2 and apical garithmic phonocardiogram in mitral endocarditis in a woman, ged 20, as they appear for direct visual observation. Auricular com- lex (α) occurs between P and Q waves of electrocardiogram ; central α) complex is separated from first heart sound by an interval and is form of presystolic gallop. First sound is accentuated and is followed y systolic murmur (SM). Second and third heart sounds are also een. Diagnosis is mitral stenosis.

HEART-SOUND RECORDS

The following records were registered with the phono-electrocardioscope.

Case 1.—A stethoscopic apical phonocardiogram and lead 1 of electrocardiogram in a boy, aged 10 years, taken on moving film are shown in fig. 4. The first, second, and third heart sounds are clearly recorded.

The first heart sound has four components: *a*, due to auricular systole; *b*, produced at the beginning of the isometric contraction phase which finishes before the beginning of the ejection phase of ventricular systole; *c*, coincident with the onset of the ejection phase; and *d*, associated with the maximal ejection phase. The auscultator rarely hears the first and fourth components of the first heart sound: the sound he hears comprises the second and third components.

The second heart sound has four components: *e*, coincident with the beginning of the diastolic fall in pressure with relaxation of the ventricle; *f*, coincident with closure of the semilunar valve (end of ventricular systole); *g*, caused by vibrations in the arterial wall and in the aortic column of blood; and *h*, presumably caused by the opening of the mitral and tricuspid valves. The auscultator hears the second component of the second heart sound, but the first, third, and fourth components are attenuated or sometimes obliterated.

The third heart sound is registered well in the stethoscopic phonocardiogram, and its duration range is longer than by the logarithmic method. This sound is generally of low frequency and weak intensity. It is generally very difficult to hear by auscultation. The third heart sound is probably caused by vibrations of the ventricular walls due to their sudden distension by the onrush of blood from the auricles into the ventricles in the period of rapid ventricular filling.

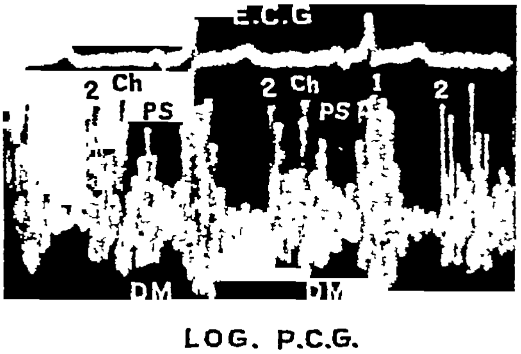


Fig. 8—Electrocardiogram lead 2 and apical logarithmic phonocardiogram in advanced mitral stenosis. Traces were photographed as they appeared for direct visual observation. 1 and 2, first and second heart sounds ; Ch, opening snap of mitral valve ; DM, diastolic murmur.

A logarithmic phonocardiogram of the same patient taken over the same area and accompanied by lead 1 of the electrocardiogram is shown in fig. 5. This type of phonocardiogram tends to agree with the auscultatory impression of the auscultator. The logarithmic phonocardiogram tends to register the second and third components of the first heart sound—i.e., *b* and *c*—but obliterates the first and fourth components, since these are of low frequency. This means that an auscultator can very rarely hear the first and fourth components of the first heart sound. The second and third heart sounds are also affected in this type of recording.

Case 2.—A linear phonocardiogram and stethoscopic phonocardiogram taken over the apical area in a man, aged 20, are shown in fig. 6. The traces were photographed on still film as they appeared for direct visual observation. The linear phonocardiogram can register the first and fourth components of the first heart sound but not so well the second and third components. Third heart sound registers well in this type of record. The stethoscopic phonocardiogram shows splitting of the first heart sound, owing to an exaggerated separation of the two major components of the first sound, the isometric phase and the ejection phase components: this may often occur at the end of expiration. This splitting of the first sound may be, and is in this particular case, a purely physiological event.

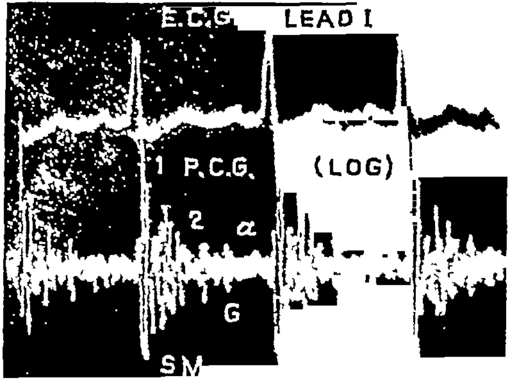


Fig. 9—Electrocardiogram lead I and apical logarithmic phonocardiogram in hypertensive heart disease: 1 and 2, first and second heart sounds; SM, systolic murmur; G, protodiastolic gallop; α, auricular complex. Traces were photographed as they appeared for direct visual observation.

Case 3.—An electrocardiogram lead 2 and a simultaneous apical logarithmic phonocardiogram in mitral endocarditis in a woman, aged 20, are shown in fig. 7. The traces were photographed on still film as they appeared for direct visual observation. The record shows an accentuated first heart sound, a form of presystolic gallop, systolic murmur, and second and third heart sounds.

Case 4.—A record of an advanced case of mitral stenosis in a woman, aged 30, is shown in fig. 8. It shows lead 2 of the electrocardiogram and an apical logarithmic phonocardiogram. The phonocardiogram shows the first and second heart sounds, the opening snap of the mitral valve, and a mid-diastolic murmur. The traces were photographed on still film as they appeared for direct visual observation.

Case 5.—Fig. 9 shows simultaneous electrocardiogram lead 1 and an apical logarithmic phonocardiogram in hypertensive heart disease, photographed as they appeared for direct visual observation. The blood-pressure was 230/140 mm. Hg. The phonocardiogram shows an accentuated first heart sound, a well-marked systolic murmur, and protodiastolic gallop rhythm.

Pulse Velocity.—By recording a simultaneous phonocardiogram or electrocardiogram with the finger-tip peripheral pulse one can time the interval between the beginning of the ejection phase of ventricular activity and the appearance of the pulse in the finger-tip. Fig. 10 is a record of an apical linear phonocardiogram and a peripheral pulse taken through the finger-tip in a man aged 40. The peripheral pulse has been registered by passing a beam of light through the tip of the index finger. The emergent beam strikes a photoelectric cell which changes any variations in the intensity of light into a corresponding variation in an electric circuit. The changes in light intensity vary with the changing blood-volume within the part. The electrical variations due to the varying translucency of the finger-tip are amplified by the second channel of the amplifying unit and are recorded on the fluorescent screen. The rate of propagation of the pulse is an index of the average elasticity of the arterial stem.

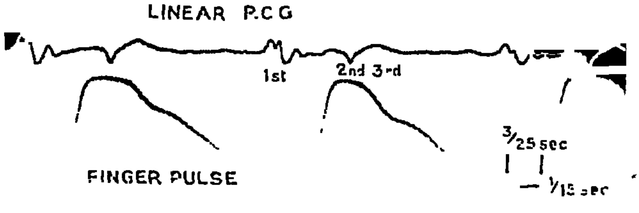


Fig. 10—Simultaneous linear apical phonocardiogram and peripheral finger-tip pulse recorded by author's photoelectric plethysmograph. Traces were photographed on moving film.

CONCLUSIONS

Much of the discussion by clinicians on phor graphy is unsound because of their failure to the important difference between heart-sound r registered by apparatus of widely different charact Various types of phonocardiograms, such as the arithmic, stethoscope, and linear, have not infre been erroneously compared as if they were the detail. It is possible that many of the inaudible which can be recorded may eventually prove to almost as much clinical significance as have the sounds and murmurs.

The time has come when a committee should be up for the standardisation of phonocardiographs. standardisation should not be too rigid, since it retard progress.

I wish to thank Mr. H. Marriott, B.ENG., B. A.M.I.E.E., lecturer in electrical engineering at College, London, for his help.

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EXPERIMENTAL MACROCYTIC AN IN THE RAT *

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STUDIES of the pathogenesis of pernicious an have been hindered by our inability to reproduce disease experimentally in an animal, and by the abs of a test for the therapeutic potency of liver extr other than their clinical trial. Many tests have b suggested for the assay of liver extracts; King (1 has reviewed these and points out that none has b proved of value. Castle's (1929) observations sugges that pernicious anæmia might be produced experiment by resection of the stomach, but in practice exp mental resections of the stomach, alone or accompan by resection of part of the small intestine, have failed produce the disease in the several species which have b used (Petri and Jensenius 1941, Jensenius 1945). some recent dietary experiments (Cartwright et 1946, Welch et al. 1947) a macrocytic anæmia been produced by adding a folic-acid antagonist t purified diet. It is uncertain what relation this condit bears to the natural disease.

Another line of approach is suggested by the occasio association, in man, of anæmia closely resembl pernicious anæmia with gross intestinal disease. T has been known since Faber's (1897) report, and Ba and Hummel (1939) collected 51 cases of macroc anæmia in association with intestinal stricture anastomosis. Other cases have been reviewed Jensenius (1945). In anæmia of this type the bl picture is often indistinguishable from that of pernici anæmia, and, where it has been examined, the mar has usually been megaloblastic. The anæmia dif from pernicious anæmia in that achlorhydria and leu nia are variable features, and the incidence of neuro-ical disease is lower. Treatment with liver extracts usually effective, as is surgical correction of the intes-al abnormality. In some of these cases steatorrhœa s been present, and the anæmia has been likened to that of sprue, but study of the case-records suggests that, though steatorrhœa is usual where there is a gastro-colic or high jejunocolic fistula, it is uncommon in other examples of this syndrome. A case under our own observation has shown that steatorrhœa is not an essential feature; in this patient megaloblastic anæmia lowed an operation at which adjacent loops of ileum re anastomosed to by-pass a subacute obstruction m regional ileitis, but the output of fæcal fat, during a ree-day balance experiment, was within the normal nge.

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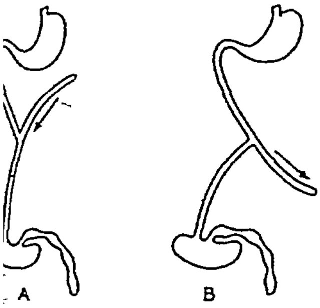
* The expenses of this investigation were in part defrayed b grant from the Medical Research Council.



. 1—Operations A and B, showing direction of peristalsis in loops.

Some early experiments suggested that it was possible produce a similar condition in animals. Seyderhelm al. (1924), by forming intestinal strictures in dogs, oduced an anæmia with a blood picture resembling at of pernicious anæmia, and Tönnis and Brusis (1931) tained similar results in dogs by forming blind intestinal ops.

This paper is an account of some experiments of this pe, using rats as the test animal. We found that acrocytic anæmia may follow the formation of either stricture or a blind intestinal loop; but as no reliable eans could be found for producing a non-fatal stricture, op formation was made the standard operation.

METHODS

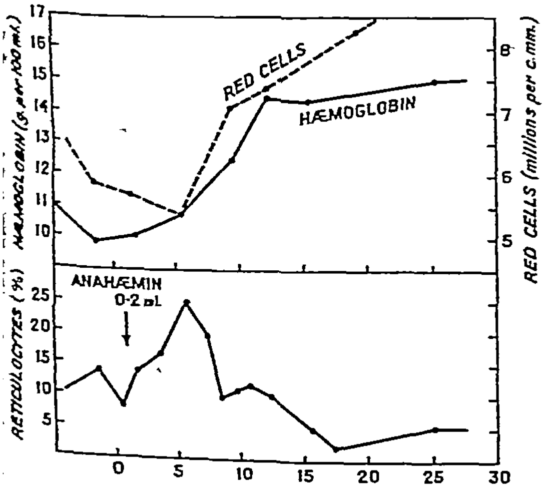
The rats used in these experiments were albinos of istar strain and of either sex. The operations were ne on rats aged 4–6 months; in rats of this age the ood-count has reached the normal adult level. The ts were maintained on a diet of casein, corn starch, and d-liver and arachis oils, with mineral and vitamin pplements; this diet permitted normal growth and production in intact animals, and control animals kept on it for a year did not develop anæmia. The composition of this diet, which was fed in excess, was as follows:

Corn starch	68%
Casein (unextracted)	25%
Cod-liver oil	2%
Arachis oil	2%
Salt mixture [1]	3%

Vitamin supplements:

Thiamine	100 μg.	daily
Riboflavine	200 ,,	,,
Pyridoxine	100 ,,	,,
Calcium pantothenate	200 ,,	,,
Vitamin K..	40 ,,	,,
Nicotinic acid	1 mg.	,,
Choline hydrochloride	10 ,,	,,

In addition vitaminised oil containing 2000 units of vitamin A and 200 units of vitamin D was given twice weekly, and 3 mg. of α-tocopherol was given once weekly.



ig. 3—Response of rat with ma……cytic anæmia given anahæmin ……n A).

It is probable (Jensenius 1945) that at least a third of the small intestine can be excised without serious effect on nutrition, and for the initial experiments the loop was made this length—about 12 in. Two types of operation were used: (1) in operation A the direction of peristalsis was such as to tend to empty the loop (fig. 1, A); and (2) in operation B peristalsis tended to fill the loop (fig. 1, B). In a later modification of operation B the length of the loop was reduced to 3 in.

RESULTS

Macrocytic anæmia followed each operation in a proportion of the animals submitted to it, and its characteristics were the same for each type of operation. It was found, however, that anæmia developed after operation A only when there was some stenosis at the site of anastomosis, leading to dilatation of part of the loop. For this reason operation B was adopted, and this gave a much higher proportion of anæmic animals, though the immediate mortality after this operation was higher owing to its technical difficulty. After this operation the loop always becomes dilated.

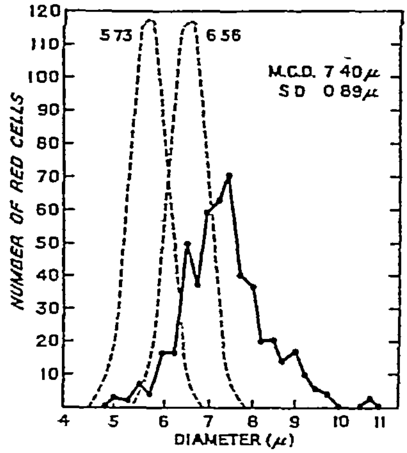


Fig. 2—Price-Jones curve from anæmic rat. Curve reveals macrocytosis and anisocytosis. Interrupted lines show limits of normal curves for rat blood, using Price-Jones convention of ±3 standard deviations.

Of the rats prepared by operation A 118 survived its immediate effects, and 21 (18%) of these developed macrocytic anæmia, at times varying from six weeks to a year after operation. With operation B, using a long loop, the mortality by the end of three weeks approached 75%; and, though by that time nearly all the surviving rats had a macrocytic anæmia, the disturbances produced by so large a loop were excessive, and the rats could not be saved with liver extract. When this operation was *modified by shortening the loop to 3 in.*, results were more satisfactory: of 24 rats prepared in this way 17 survived, and 13 of these have developed macrocytic anæmia at an average interval of 8 weeks after operation.

DESCRIPTION OF THE ANÆMIA

The normal hæmoglobin level in our rats is about 14 g. per 100 ml., and anæmia has not been diagnosed unless the hæmoglobin has fallen below 10 g. per 100 ml. In practice it is found that the rats either remain well or become progressively and severely anæmic. The red cells, which are normally a little fewer than 9,000,000 per c.mm., often fall at the same rate as the hæmoglobin, with the result that the colour-index does not change, but in some rats there has been hyperchromia. A count as low as 3·3 g. of hæmoglobin per 100 ml. and 2,150,000 red cells per c.mm. has been found, but usually the rat dies before the anæmia becomes so severe.

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[1] As recommended by Hubbell et al. (1937).

The presence of macrocytosis has been shown by increases in the mean cell diameter and by an extension of the Price-Jones curve beyond the upper limits of normal, and confirmed in several cases by an increase in the mean cell volume. The normal mean cell diameter is 6·14μ, and in anæmic rats mean diameters as large as 7·40μ have been observed; the average increase is about 0·6μ. The normal mean cell volume is $49\mu_3$; readings of $70\mu_3$ or more were sometimes seen, but estimates of the mean cell volume are subject to considerable error, and increases in the mean cell diameter were not always accompanied by an increase in the mean cell volume. *Anisocytosis was a striking feature of the* anæmia, but poikilocytosis was never more than slight.

THE BLOOD PICTURE OF RATS WITH MACROCYTIC ANÆMIA

—	Hæmoglobin (g. per 100 ml.)	Erythrocytes (millions)	Reticulocytes (%)	Hæmatocrit (%)	M.C.H. (μμg.)	M.C.V. (c.μ.)	M.C.D. (μ.)
Normal mean	13 8	8 69	4	42	16	49	6·14
Anæmic rats							
1	10 0	5 70	3	28	18	49	6·46
2	8·5	3 80	27	27	22	71	6 99
3	3·3	2 15	14	—	15	—	7·40
4	8 8	5·60	10	31	16	55	6 73
5	8 3	4·56	16	—	18	—	7·09
6	8·7	5 80	10	31	15	54	6·44
7	5 8	3 32	27	22	17	66	6 44
8	8 8	7 40	11	42	12	57	6·42
9	8 6	4·13	18	23	21	55	6·50
10	7 0	4 80	21	—	15	—	6 60
11	8·3	5 00	22	29	17	58	—
12	4 9	3·35	40	18	15	54	6·38

The first 6 rats were prepared by operation A, and the last 6 by operation B.

The anæmic animals have an irregular reticulocytosis manifested in the stained films by increased polychromasia. Nucleated red cells were usually present in peripheral blood films. Leucocytes were present in normal numbers and did not show appreciable qualitative change. Some of these points are illustrated in figs. 5 and 6. In fig. 7 a blood film is shown from a rat with a hypochromic normocytic anæmia; this type of anæmia was *occasionally seen after operation A only, and the* appearance of the film is in striking contrast to that seen in macrocytic anæmia. These photomicrographs are all at the same magnification. Fig. 2 is a Price-Jones curve from a rat with macrocytic anæmia.

Once anæmia has appeared it usually progresses fairly rapidly if untreated, and the limit of survival appears to be about a month. A few anæmic animals prepared by the earlier technique had spontaneous remissions of their anæmia, but this has never happened after operation B. Animals with anæmia tend to lose weight and regain it with a therapeutic remission. They do not show any external evidence of deficiency disease. The

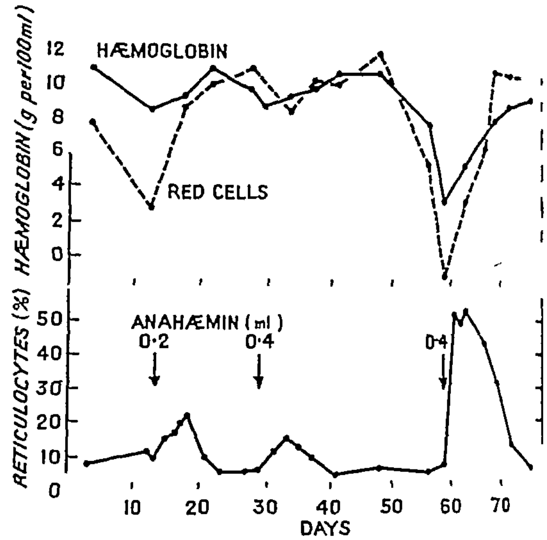


Fig. 4—Responses of rat with macrocytic anæmia given injections of anahæmin (operation A).

accompanying table gives representative examples, various levels, of the blood findings in animals anæmia.

CHANGES IN THE BONE-MARROW

Bone-marrow smears were made from normal anæmic rats by a method which did not involve of the animal (Cameron and Watson 1948). from rats with macrocytic anæmia showed increased cellularity, and the most striking ch distribution was an increase in the proportion of red-cell precursors. In smears from normal rats predominant cells of the erythroblast series are polychromatic normoblasts with dense or nuclei; this distribution was unaltered in rats to repeated hæmorrhage, but in rats with anæmia there were increased numbers of pro- blasts and basophil erythroblasts. The degree of change varied considerably in different rats. No were seen which corresponded exactly to the blasts seen in human pernicious *anæmia*, but there some cells of the erythrocyte series which *abnormal in that the nucleus did not have the* character seen in cells from normal marrow, *occasional cells had a closer resemblance to the* blast. Marrow from anæmic rats showed increa numbers of plasma cells, but there were no apprecia

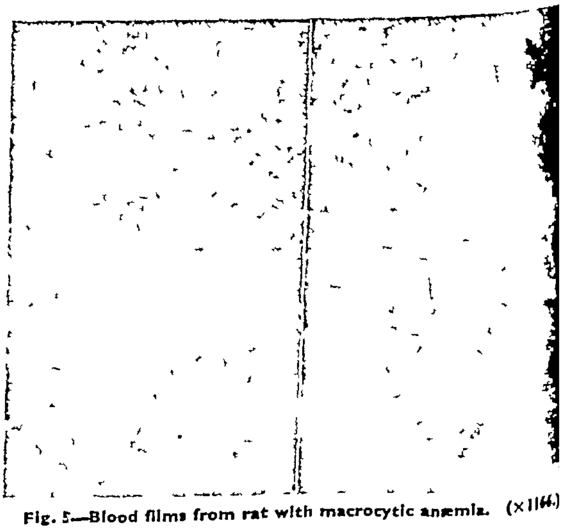


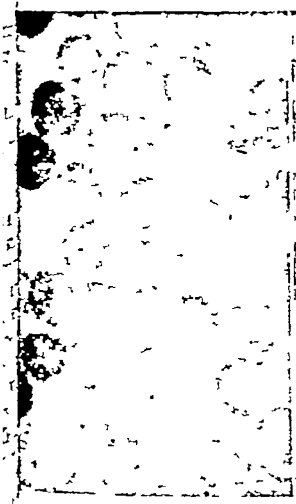
Fig. 5—Blood films from rat with macrocytic anæmia. (×1164.)

anges in the myeloid series. Figs. 8 and 9 are photo-
aphs of marrow from a normal rat and from an anæmic
t with a well-marked shift to the left of the red-cell
ries.

EFFECT OF LIVER THERAPY

If the rat is to be used as a test object for the anti-
rnicious-anæmia principle or for similar purposes, it is
portant that the amount of the hæmoglobin should
t be allowed to fall too low. The rat is a small animal
th a brisk metabolism and does not tolerate anæmia
ll. If the hæmoglobin falls much below 7 g. per 100 ml.
e rat becomes torpid and sleepy, its nutrition and resis-
nce to infection are impaired, and the state of ill-
alth may become irreversible. For this reason tests
e probably made best at a level of 7–9 g. of hæmoglobin
r 100 ml.

A commercial preparation, 'Anahæmin,' was used to
udy the effect of liver extract on the macrocytic
æmia; the extracts which were used had been tested
inically in man and found to be active. Anahæmin
as given by injection in doses of 0·1–0·4 ml. to 17 rats
epared by operation A; 10 of these showed a response
the liver extract. Of the 7 rats which did not respond
4 had extensive septic infections and 2 had a fatal degree of intestinal obstruction. The observed responses to liver extract varied considerably in degree; the responses of 2 animals are shown in figs. 3 and 4. These results suggested that the anæmia responded to liver when it was not complicated by infection. More clear-cut results were obtained with rats prepared by operation B, with a 3-in. loop; there were no complicating infections in this group. From a group of 10 anæmic animals 5, chosen at random, were left untreated; these rats all died with a progressive anæmia, none surviving more than a month after anæmia was first noted. Of the remaining 5 rats 4 were given one or two injections of 0·4 ml. of anahæmin; these all showed a response to the liver and have remained alive and under observation for as long as eight weeks. The response to liver extract was again rather variable, 2 rats regaining completely normal blood-counts, while the other 2 had improved but still subnormal counts. The remaining rat of this group was injected with 15 mg. of synthetic folic acid; it too has shown a satisfactory response, the hæmoglobin and red-cell count rising nearly to normal in fourteen days. More observations are necessary to determine the optimum dose of liver extract. These preliminary observations suggest that, when an adequate dose of liver extract is given at a level of 7–8 g. of hæmoglobin per 100 ml., reticulocyte increases of about 20% may be expected. The red-cell count rises at a rate of about 2,000,000 per c.mm. per week, though the hæmoglobin tends to lag behind. The most striking reticulocyte responses were seen in the rats prepared by operation A. In the more acute anæmia which follows operation B there is a greater reticulocytosis in the untreated animal; in these rats the reticulocyte percentage rose by a similar amount, but the higher initial count made the response less striking.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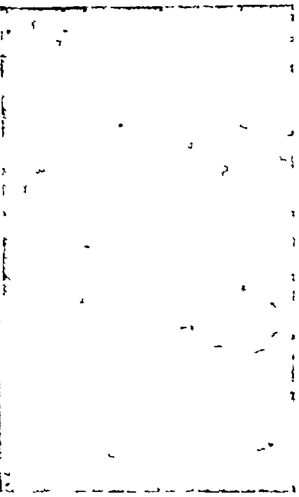
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Fig. 6—Blood film from normal rat. (× 1166.)

Fig. 7—Blood film from rat with hypochromic normocytic anæmia. This type of anæmia was seen occasionally after the earlier operation, but not after operation B. (× 1166.)

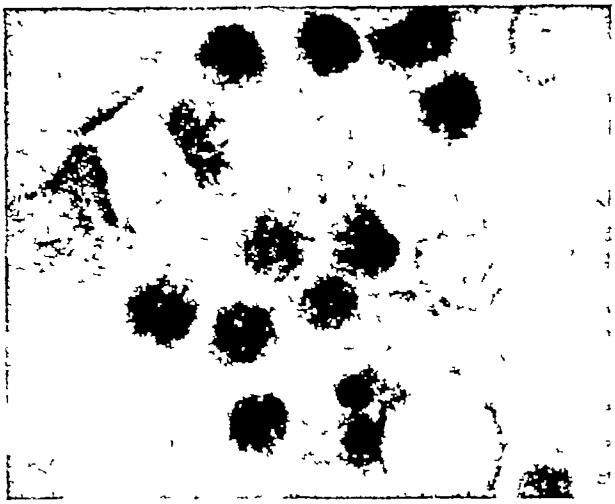
Fig. 8—Marrow smear from normal rat. (× 1166.)

DISCUSSION

Several types of operation have been tried in these experiments. All of them may be followed by macrocytic anæmia, but only in the case of a 3-in. loop made to fill by peristalsis was there a high incidence of anæmia accompanied by a reasonably low mortality. We have made some experiments to determine the most useful site for the loop, and have found that the exact position is unimportant provided that it is in the upper or middle part of the small intestine. In a small group of animals, in which the loop was placed immediately above the cæcum, no anæmia has developed.

An unexpected feature of the animal anæmia was the large dose of liver extract necessary to produce a

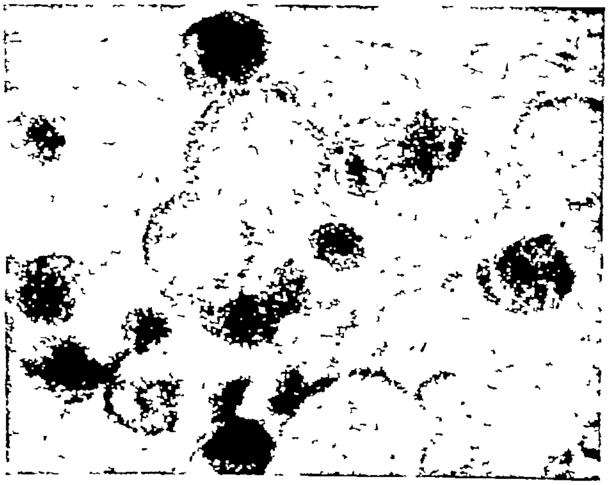
Fig. 9—Marrow smear from rat with macrocytic anæmia. (× 1166.)

remission. Our impression is that the size of the dose depends on the size of the loop and on the rapidity of onset of the anæmia, but in any case at least 0·1 ml. of anahæmin was necessary to produce a remission, and in some cases as much as 0·8 ml. The manner in which liver extracts produce their effects is unknown, and it may be that calculations based on the weight of the animal are unreliable. A further point is that possibly, in small animals like the rat, the life span of the red cell is much less than in man, and the need for hæmopoietic principle may be correspondingly greater.

The anæmia seen in these rats resembled in most of its features the anæmia observed in human cases of intestinal stricture or anastomosis, and probably the two conditions are produced by a similar mechanism. What this mechanism is, and what is the relation of anæmia of this kind to Addisonian pernicious anæmia, remains uncertain. A working hypothesis is that materials are formed in the stagnant loop which in some way interfere with the formation, absorption, or utilisation of hæmatinic principles, and experiments designed to test this hypothesis are already planned. Diarrhœa was not present, and no symptoms of neuropathy were seen. Fat-balance experiments and the results of examination of the nervous system will be reported later.

A good deal of experimental work in animals has been confused by the presence of latent bartonella infections, which become manifest after splenectomy. However, we have no reason to believe that our rats had bartonellosis, or that bartonella infections can be activated in so specific a way by the formation of a dilated blind loop of intestine. Perla and Gottesman (1932) reported that a dietary supplement of copper and iron in amounts of 0·1 and 1·0 mg. respectively daily protected rats from bartonella infection, and the diet for the present experiments included these supplements. Finally, bartonella infection does not respond to liver in this way.

We have also not yet had opportunity to discover how specific is the response to liver and folic acid in these rats. The only other material with which we have experimented is pantothenic acid, and this was without effect. We have published the results obtained to date because they have already been reported at scientific meetings in this country and have attracted a good deal of interest. They seem to offer the promise of a reliable method of assay of liver extracts. They certainly provide a preparation which should be of value in revealing the mechanism of pernicious anæmia and allied megalocytic anæmias, which at present seems so complicated and obscure.

SUMMARY

The formation of a blind intestinal loop in the rat causes a macrocytic anæmia which responds to treatment with liver extract.

The pathogenesis of this anæmia is not yet known, but it depends on dilatation of the blind loop, with accumulation within it of intestinal contents.

The technique described is likely to be useful in the bio-assay of liver extracts and in analysing the mechanism of pernicious anæmia and allied megalocytic anæmias.

We are greatly indebted to Miss A. Hogg, Miss B. Mallet, Miss C. Stayte, and Mrs. M. Bruce-Lockhart for their help in this investigation, which has necessitated much tedious work in the *care of the animals and in making blood* examinations.

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PRIMARY TUBERCULOSIS WITH MENINGISM AND BACILLI IN THE SPINAL FLUID

SIGNIFICANCE IN STREPTOMYCIN TREATMENT OF TUBERCULOUS MENINGITIS

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In an address on tuberculosis in childhood, given t the Greek Pædiatric Society in February, 1946, w discussed two new forms of the primary complex (th pyuric syndrome and the form with intermittent fever and also described some associated manifestations i the central nervous system. We reported that 2 of ou cases developed convulsions with each rise of temperature. In 3 other cases we noted exaggerated reflexes *which at times reached the stage of ankle clonus.* Since such phenomena mean irritation of the pyramidal tr their presence in the course of an acute primary inf led us to fear that tuberculous meningitis was imminent. However, it fortunately did not follow. [illegible] of the cerebrospinal fluid (C.S.F.) showed occasional rise in tension but no other abnormality either in composition or in cell-count. The neurological signs gradually subsided with the regression of the fever, malaise, &c., and disappeared.

These cases have been succeeded in our experience by others, and a similar case in an infant has been described by Dr. Zervos, assistant professor of pædiatrics in Athens, in a thesis dated 1947. There seems to be no doubt that they represent meningism during the primary infection, and we believe the explanation is a serous reaction of the meninges during the hyperergic period of the disease.

The appearance of meningitic signs which do not g on to tuberculous meningitis is of both theoretical and practical importance. It supports the view that during the course of tuberculous infection in childhood a local *inflammatory reaction occurs on a specially* allergic ground. This meningeal reaction does not develop *clinically* beyond the stage of slight meningism, either because it is limited and remains in the stage of simple inflammatory reaction, or because the development of tubercles is also limited and does not spread. Laboratory findings show only "a slight degree of hydrocephalus due to oversecretion by the choroid plexus."

Lincoln[1] refers to this *type* of meningeal reaction, *with no changes* in the C.S.F. except *slight increase* in pressure and in cell-count, *but with tubercle bacilli present.* This means that the presence of the tubercle bacillus in the C.S.F. does not always imply the development of meningitis in its full form. We have had 2 similar cases under our care.

CASE-RECORDS

Case 1.—A boy, aged 11 months, entered our clinic on Jan. 16, 1948. His mother said that a month earlier the

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[1] 1. Lincoln, E. *Amer. Rev. Tuberc.* 1947, 56, 75.

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d was ill with bronchopneumonia and enterocolitis. After acute illness he had not fully recovered: and on the day ore admission he developed cough and anorexia, and ame febrile and restless.

amination.—Under weight (17 lb. 3 oz.), pale, and rest- . Slight nuchal rigidity; tendon reflexes exaggerated. gs normal.

nvestigations.—Blood: red cells 3,800,000 per c.mm.; ite cells 13,500 per c.mm. (polymorphs 46%, lymphocytes %). Blood-sedimentation rate (Linzenmeier) 10 mm. ntoux reaction (1/10,000) + + +. C.S.F. (cisternal punce): under normal pressure, clear; protein 20 mg. per ml.; cells 8 per c.mm.; glucose 40–50 mg. per 100 ml.; orides 540 mg. per 100 ml.; tubercle bacilli present on ture. Urine normal. Radiographic examination of chest: ateral hilar adenitis.

Progress.—Pyrexia continued for 5 days, and then slowly osided. The patient was discharged after 15 days, clinically proved, with the diagnosis of tuberculous adenitis and ningism. He was followed up at home and seemed well. mbar puncture was performed on Feb. 26 (40 days after mission); the C.S.F. was normal in all respects, and on lture no tubercle bacilli were found. When seen four onths later, the child appeared perfectly well, and physical amination revealed nothing abnormal.

Case 2.—A boy, aged 2 years; only child. Parents althy, but an uncle with pulmonary tuberculosis had come live in the home a few days after patient's birth. Birthight 8 lb. 11 oz.; B.C.G. vaccination not undertaken; east-fed for six months. After the fourth month became ldly pyrexial, and during the previous week temperature e to 100–101°F, on which account he was admitted on rch 15, 1948.

Examination.—Nutrition poor, mucosæ pale. Tongue ated; tonsils slightly injected; liver just palpable; spleen larged 2 fingerbreadths below costal margin. Heart, lungs, d central nervous system normal. Lymph-glands not lpable.

Investigations.—Blood: red cells 3,500,000 per c.mm.; ite cells 12,600 per c.mm. (polymorphs 36%, lymphocytes %, large monocytes 4%, normoblasts 1–2%). Sternal ncture: no leishmania or malarial parasites. Mantoux action (1/1000) + +. C.S.F.: pressure slightly increased, ear; protein 20 mg. per 100 ml.; cells 1–2 per c.mm.; bercle bacilli not found on direct smear, but present on lture. Urine normal. Radiographic examination of chest: t hilar adenitis.

Progress.—Pyrexia persisted. General condition satistory; no vomiting or constipation. Patient complained ly once of headache. From four days after admission given eptomycin intramuscularly 0·15 g. four times daily for week; total dosage 4·5 g. After the first dose of eptomycin the temperature became and remained normal. scharged on March 26. Two and a half months later clinical dings normal. Parents objected to further lumbar puncture.

DISCUSSION

There seem to be two possible explanations for such ses as these: (1) tubercle bacilli circulate in the C.S.F. ithout there necessarily being a focal lesion with its linical sequelæ; or (2) the bacilli derive from a focus the meninges which is too small to cause clinical anifestations, does not enlarge, and eventually recedes nd disappears. Both explanations are feasible, but the econd seems to be the more likely.

This problem is connected with that of the clinical actions and laboratory findings in tuberculous meninitis treated with streptomycin, about which these rther questions have to be answered:

1. Why do some cases respond immediately to streptomycin, ereas others respond slowly, and still others not at all?
2. Why is clinical improvement sometimes not accompanied parallel change in the C.S.F., the abnormality of which rsists?
3. What is the criterion of cure (if we can speak of "cure")? oes it rest on the clinical condition, on laboratory findings, on negative results of culture for the tubercle bacillus?

In practice the most urgent question is the third; and e consider that the return of the cells and chemical state the C.S.F. to normal is more significant than a negative lture. In 2 cases of another series, where the patients were discharged from the clinic as "recovered," culture of the C.S.F. a few days before discharge was positive for tubercle bacilli; and yet six months later both children appeared perfectly well. Clearly streptomycin is *forcing us to review our earlier conceptions* of the pathogenesis and development of tuberculous meningitis.

SUMMARY

Two cases are described in which tubercle bacilli were isolated from the C.S.F., without accompanying manifestations of tuberculous meningitis.

Both patients, one of whom received streptomycin, survived, and they were well 4 and $2\frac{1}{2}$ months later.

In the C.S.F. tubercle bacilli may sometimes either (1) exist without any focal lesion in the brain or meninges; or (2) derive from a minimal meningeal lesion which resolves. The second explanation seems the more likely.

It is suggested that in assessing "cure" of tuberculous meningitis greater weight should be attached to chemical and cytological findings in the C.S.F. than to the results of culture for the tubercle bacillus.

ACCIDENTAL INTRA-ARTERIAL INJECTION OF DRUGS

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(Concluded from p. 371)

DANGERS OF THERAPEUTIC OR DIAGNOSTIC INTRA-ARTERIAL INJECTIONS

Tragedies following the intra-arterial injection of therapeutic substances or contrast media for radiography have also been collected in the hope that they may throw some light on the pathology and indicate the treatment. Gangrene of the fingers has followed accidental injection of iodoxyl for pyelography (B. Johnson, personal communication); sodium tetrachlor-iodo-phenolphthalein for cholecystography (S. I. Levy, personal communication); iodides for arteriography (White 1935); diodone injected into the femoral artery for leg arteriography has ended disastrously (Maybury 1946); and ethanolamine injected into the femoral artery instead of into varicose veins necessitated a high amputation of the thigh (Medical Defence Union 1947).

Levin and McElroy (1944) have described a case of cerebrospinal fever with thrombosis of the right axillary artery, followed by gangrene of arm and forearm. The patient, who was at first unconscious, received therapeutic intermittent intravenous injections of sulphapyridine into affected arm. Levin and McElroy agree that the gangrene is difficult to explain but admit that intra-arterial injection was a possibility. The pH of sulphapyridine is about the same as that of thiopentone, and its destructive effect, when it is injected in the region of nerves or into the spinal canal, is known to have caused several tragedies (Roberts 1942).

Gangrene of the hand has followed the injection of quinine. I am indebted to Mr. Frank Nicholson for the following case-report:

A patient with malign tertian malaria was admitted more or less in coma into a hospital in Tripoli. Intravenous quinine was required, and in the ensuing struggle the left brachial artery was probably punctured. I was asked to see the patient next morning, when the left hand was cold, white, and anæsthetic up to the wrist, and the radial pulse was absent. Exploration under general anæsthesia showed a hæmatoma beneath the deep fascia. The brachial artery was narrowed to the size of the radial artery, and there was a definite needle puncture in its anterior wall. Two inches of brachial artery was resected; local and stellate ganglion procaine block. The ultimate result is uncertain, for Mr. Nicholson embarked next day for Sicily; but I understand from a colleague attached to the same division that amputation through the forearm became necessary.

Sir Philip Manson-Bahr informs me that he has heard of no similar tragedy with quinine, nor have the Army and other tropical disease authorities. Schmuttermayer (1936) records a "burning sensation in the hand" following intramuscular quinine on the outer side of the mid-arm; radial nerve-palsy followed, but the symptoms suggest some intra-arterial injection as well. "Malarial gangrene" of the foot, in a previously healthy man of 42, has been recorded (Lee 1937); but this complication has ensued usually only in neglected cases (Manson-Bahr, personal communication). Samuels (1945), describing malarial gangrene, states "it is usually caused by thrombosis of the arteries—the brachial artery is often involved"; such accidental intra-arterial injection may have been overlooked.

Extramural spilling of neoarsphenamine is well known to be followed by local sloughing. The intra-arterial accident seems to have been rare, for Dr. V. E. Lloyd, who is in charge of a V.D. clinic at Guy's Hospital, writes in a personal communication (1945): "No instance has happened in my hands or in the hands of anyone working with me. I have never heard the 'accident' referred to at meetings of the Medical Society for the Study of V.D. throughout the last twenty years."

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> A man, aged 50. "No difficulty was noticed with the injection, and no unusual symptoms occurred at the time. After a few days pains started in the hand, which became swollen, with brawny œdema extending 3 in. above the elbow. The diagnosis of brachial artery thrombosis was made and the arm later amputated. A recent thrombus filled the brachial artery from a point 3 in. above its bifurcation downwards. Section showed slight endarteritis. There was no evidence of wounding of the artery or escape of salvarsan into the tissues."

Gammel (1927) has recorded extensive gangrene of the buttock following the "intramuscular" administration of bismuth. He reviews the literature, which includes several such cases, and shows that the effects were due to the injection into the inferior gluteal artery.

> A particular feature of one of the cases he describes was the development of foot-drop. This neurological information is important, for the inferior gluteal artery is the main artery of supply to the sciatic nerve, and experimentally Okada (1905) showed that ligature of the inferior gluteal artery of a rabbit was followed by paralysis of the sciatic nerve.
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> This case is thus the first clinical confirmation of the profound effect of a single regional vessel on its nerve of supply, and provides the evidence that Adams (1942), in an exhaustive paper on the blood-supply of nerves, was seeking. It also appears to confirm the view already put forward that some of the effects in the thiopentone cases are due to thrombosis spreading to the vessels of supply of the major nerves of the forearm.

The hazards of the use of sclerosants during anæsthesia, as in the treatment of varicose veins, has been receiving increasing attention in recent years. Anæsthetists need to be acquainted with the fact that under general anæsthesia, with the limb immobile, injection of sclerosants into the superficial veins may be followed by thrombosis of the deep veins, owing to the numerous deep connecting branches. The pulmonary embolus, occasionally following the Trendelenburg ligature operation, is believed to be derived from this, rather than small clot remnant at the saphenous ligature stump.

The danger of such thrombosis is greatest if injection is done with the patient under general anæsthesia; if the operation is done under local anæsthesia, immediate muscle movement will sweep away the sclerosant. Those associated with medicolegal societies also know th arteries round the ankle have been accidentally in (D. H. Patey, personal communication).

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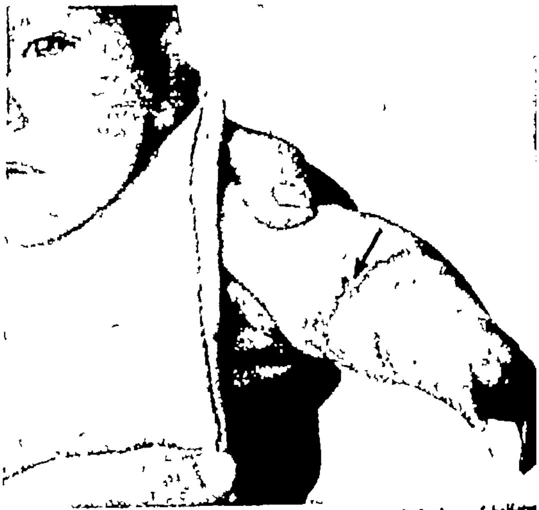

Fig. 21—Gangrene following "intravenous" infusion of half-str Hartmann's solution plus 5% glucose in a baby, aged 6 m admitted with diarrhœa and vomiting. Cannula had been intr with difficulty into "vein" (indicated by arrow) on radial asp forearm. Oscillation of fluid in drip chamber had been noted, b ceased on release of strapping holding arm to splint. (Case consultation.)

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Wallace and Richards 48) have noted also, Army "practice" nsfusions, the delayed elopment of ecchy- tic areas in the arm ll above the needle e. They suggest t it is due to intense sm of the veins ining the biceps cle. with rupture of ne of the tributaries.

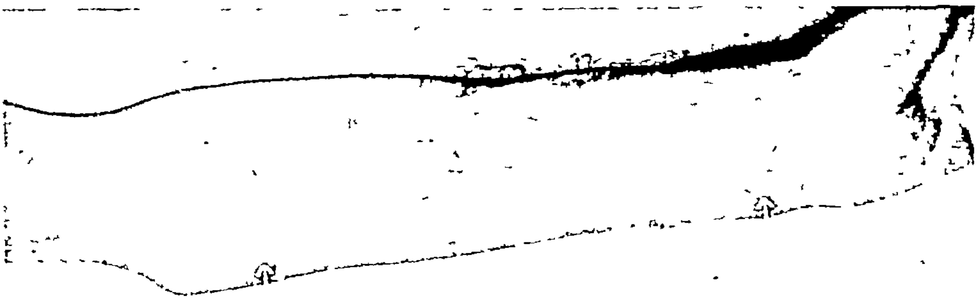


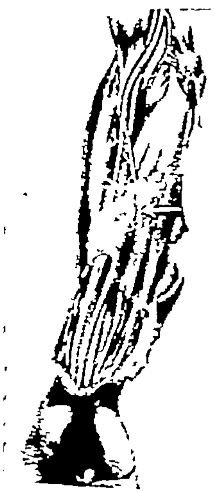
Fig. 24.—Ulnar artery subcutaneous near elbow and then proceeding below deep fascia. Vein-like appearance is shown; pulsation was evident only on close observation.

e segmental distribution of these skin patches is particular interest in view of Wood Jones's (1948) ment that it is insufficiently appreciated that limb has a number of self-contained functional ns units. and abundant arteriovenous com- ications in these areas to meet the circulatory rgency demands. It is probable—indeed to be cted—that such arteriovenous communications ld be relatively larger in the infant and thus explain retrograde filling, under pressure. of the arterial : certainly it is difficult to explain the intra-arterial mbotic clot found in these "intravenous" tragedies fants on any other basis.

ANATOMICAL VARIATIONS AT THE ELBOW

hese can be best appreciated by a brief reference embryological development. The limb buds are pervaded by a capillary network; during the sixth k of fœtal life the primary arterial channels are laid n. and there is developed a main. or axial. artery ch persists as the subclavian, axillary. and brachial ries. In the forearm most of the axial artery under- s suppression. and its primary course is represented the branch of the interosseous artery accompanying median nerve. "The radial artery arises at first higher level than the ulnar artery, but later establishes nexion with the main trunk near the site of origin the ulnar. and the upper part of its original stem appears" (Gray 1938).

uain's (1844) careful study of 451 dissected arms vides a comprehensive account of the possible varia-tions. High division of the brachial artery—i.e.. above the elbow-joint—takes place in 1 out of 10 arms: and, contrary to the usual teaching, in only a third is such peculiarity bilateral. When the division is high, the ulnar artery almost invariably reaches the distal part of the arm by passing superficially to the flexor group of muscles (10% incidence). In its downward path it may hug the radial branch in the elbow area, but at times it takes a medial sweep to lie well apart (fig. 23). In its downward superficial course the ulnar artery may occupy one of three different positions: (1) subfascial all the way down (fig. 22): (2) subcutaneous in the elbow area and then below the deep fascia (fig. 24); or (3) subfascial in the upper part of the forearm. then subcutaneous. and in the distal third of the forearm subfascial again.



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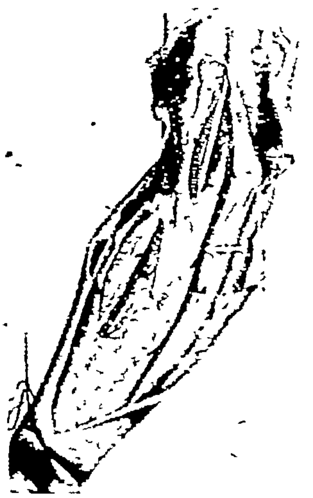

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. 22.—Ulnar artery (arrow) in subfascial plane. High division of rachial artery is more usual finding when vessel pursues this course. From Quain 1844.)

. 23.—Ulnar artery (arrow) passing down subcutaneously. Note igh brachial origin and medial sweep at elbow.

When the ulnar artery pursues this superficial course, its volar interosseous branch comes off the radial division. This fact is of the utmost importance; for, if the brachial vessel divides high, retrograde injection into the aberrant ulnar branch is unlikely to reach the brachial artery, unless the circulation has been temporarily cut off. The interosseous branch, coming off the radial division, is therefore unlikely to suffer in any thiopentone thrombosis, and via this vessel the flushing and dilution of any ulnar injected thiopentone can continue. It is also to be noted that, when the course of the ulnar artery is superficial, the vessel is usually smaller, and compensatory enlargement is invariably found in the radial division. This will also enable the freer flushing of any irritants carried by the ulnar vessel. Such superficial ulnar vessels are derived from the vasa aberrantia and. like other superficial vessels, have a fuller nerve-supply than have the deeper branches, and are more readily thrown into spasm. The latter fact explains why, in cases 10 and 12. there has followed "immediate thrombosis and thickening" after injection of the superficial ulnar artery. The relationship of these vessels to the veins of the forearm are shown in figs. 25 and 26.

Arms have been examined to see if such abnormalities can be determined during life. The vulnerable superficial ulnar artery is often encountered. I. Jacobson, after a study of 200 arms of soldiers, informs me that in 25 the arteries near the antecubital fossa were in such a position that they could easily be inadvertently punctured when an injection was given (fig. 27). There were three abnormal superficial ulnar arteries in this group. At a small meeting where this was discussed, 4 out of 25 doctors present had subcutaneous ulnar arteries. Quain (1844) made this observation in the living subject.

Hyperextension of the elbow straightens the normal tortuosity of the brachial artery and fixes it for easier injection; this, therefore, requires particular care.

Pulsation in the normal young healthy person is not easily seen, and it is unjust criticism to comment that such thiopentone tragedies would not have happened if the anæsthetist had spent a few moments looking for these vessels. Lewis (1945) comments on the forearm vessels:

division that amputation through the forearm became necessary.

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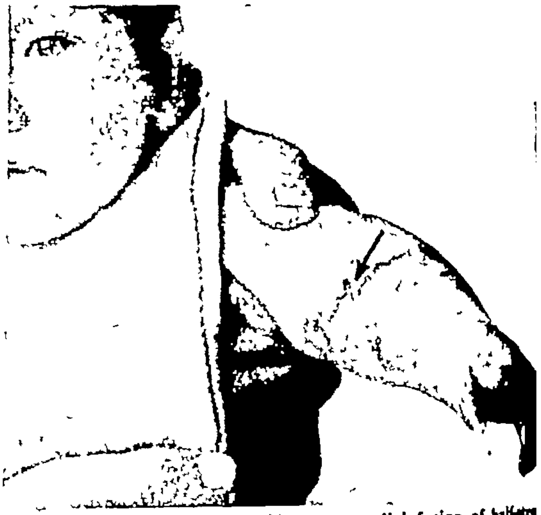

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The pathological material available to me has been in the main from thiopentone cases. Study of the tragedies following other drugs and therapeutic media indicate, however, that the circulation may be finally arrested by different mechanisms, several acting at the same time. These may be summarised as:

(1) Arterial thrombosis—most of the thiopentone cases.

(2) Arterial or distal arteriolar spasm.

(3) Extensive diffuse venous thrombosis, as after the accidental retrograde injection of sclerosants into the deep veins. I have seen diffuse venous thrombosis, in traumatic injuries, lead to limb gangrene, the arterial tree being patent and the major vessels not in agonal spasm.

(4) Extensive venous spasm. I have not seen gangrene per se follow this, but it may be a contributory cause of limb death. How great may be the peripheral resistance to arterial inflow in this type of spasm is well shown by Humble and Belyavin (1944); a pressure of 300 mm. Hg could not force the fluids into the veins.

(5) Mechanical blocking due to protein flocculation or drug precipitation, as in the concentrated plasma and myanesin cases.

(6) Arteriovenous communications enabling the retrograde spilling over of intravenous fluid into the arterial circuit. This is especially likely to happen if the fluid is given under pressure; it has been suggested as the possible explanation for leg gangrene following intravenous infusions in children.

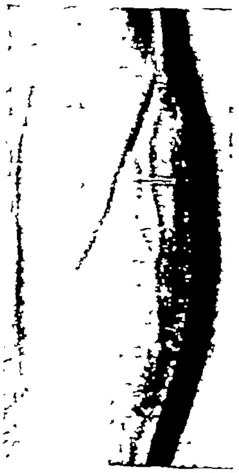


Fig. 27—Veins distended with rubber band. Arrow indicates superficial ulnar artery. Gliding of needle to enter median basilic vein may lead to puncture of artery.

There is need for experiments on animals to discover the pathological events; large animals are to be preferred, for in small animals such as the rabbit the vessels are too readily thrown into spasm by any handling and confuse the tissue. Such *facilities have not been available to me.*

TREATMENT

Anticoagulants

It would require courage on the part of the anæsthetist to order the abandonment of the operation. Obviously that is the measure most desirable, for the formation of a thrombus indicates that there is urgent need for anticoagulant therapy—heparinisation of the patient. Such anticoagulant therapy may need to be long-continued, for the case-records indicate that thrombosis may come on as late as the eighth, tenth, or fifteenth day. To combat late thrombosis dicoumarin is best; its action, however, is delayed for 48 hours, and until then heparinisation must be continued. Such anticoagulant therapy may be inadvisable after some operations, but it is usually considered safe to start heparinisation after 2–3 hours; my experience is that, in the routine operation where adequate hæmostasis has been possible, heparin may be given even earlier. The early doses of heparin should be generous, for it will not be of much value to find at the end of, say, four hours that the clotting-time has not been raised, and that further heparin in increased dosage is necessary. I suggest in the adult 15,000 units at least as the initial dose.

This larger dosage is also important, for different batches seem to vary in their potency and in their "toxic" reaction (Brown 1946). Heparin is best administered as a saline drip into the tubing of which the nurse can inject the repeated doses (Medical Research Council 1944). Humble's cannula is a suitable alternative method for intermittent administration.

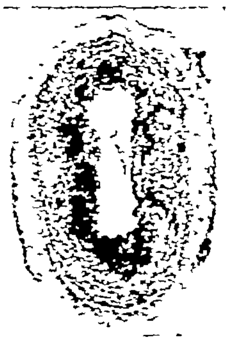


Fig. 28—Radial artery (case 9): intima thickened, and lumen filled with fibrin clot, leaving channel patent.

My experience is that intermittent administration is not adequate for the threatened arterial thrombosis; the clots form during the *night* ("free" period). Experimental studies (Kiesewetter and Shumacker 1948) confirm that a constantly prolonged coagulation-time is more desirable and superior, particularly as regards clotting in the smaller arteries.

If the anæsthetist feels certain that injection has been intra-arterial, it may be well worth inviting the surgeon to expose the vessel immediately and to inject heparin *intra-arterially. Intra-arterial* procaine, as first introduced by Goyanes in 1912, has been suggested, but its local action is evanescent unless a tourniquet is used; this could not be countenanced after thiopentone. Intra-arterial procaine has not been effective in the intense spasm that has followed the forgotten tourniquet and the crush *injury* (personal communications). Local injections of procaine round the artery were tried in two of the cases, with no effect; it has almost always *failed to release spasm of a major vessel secondary to* trauma.

Brachial-plexus Block

The anæsthetist should probably do a brachial-plexus block immediately. That should give the maximal vasodilatation in the hand and release the tone of the arteriovenous shunts on the fingers. I suggest brachial-plexus block rather than sympathetic block, because the anæsthetist is conversant with it, whereas sympathetic block, in my hands, is not so easy or so certain as the textbooks indicate. Brachial-plexus block will anæsthetise the vasoconstrictor fibres relayed from the sympathetic ganglia to the hand and forearm, the area which concerns us most; the periarterial sympathetic plexus supplying the upper portion of the brachial artery will not be affected, but this is not important. The forearm vessels will be affected, for it is now generally agreed that the vasoconstrictor nerves to the vessels leave the main nerve-trunks at short intervals to supply corresponding lengths of vessels. As Macintosh and *Mushin (1944) have pointed out, brachial-plexus block* is followed by some degree of Horner's syndrome in 50% of cases. *That must indicate* spread of the solution and blocking of the sympathetic ganglia, or its rami, as well.

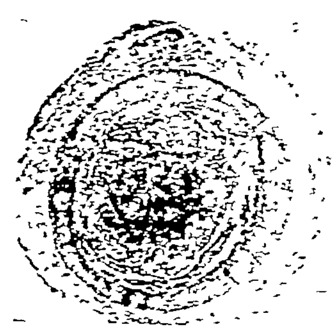


Fig. 29—Brachial artery (case 5): recent thrombosis and widespread superficial necrosis of intima.

"It is unusual for normal arteries to show visible pulsation, and then it is but slight . . . the volume change is almost negligible and only noted when the arterial wall is pressed on."

PATHOLOGY

Thiopentone in 2·5% solution has a pH about 10·4–10·6 by the glass-electrode method (Tabin cited by Adams 1944). As Adams points out, the derivatives of thiobarbituric acid are rather unstable, the disintegration products including, among others, amides and acetyl urea. To prevent hydrolysis and separation of free acid, commercial preparations contain also, as buffer, sodium carbonate 6% by weight. Thiopentone is thus a strong alkaline irritant.

An artery, with its high muscle and elastic content, is obviously less distensible than the vein, and intra-arterial injection may thus be supposed to trap the thiopentone longer. Yet arteriography shows that a hypertonic solution (50% of diodone) rapidly injected passes through the limb within a few seconds. That period may, however, be sufficient for thiopentone to exert its action. Stretching of the arterial wall by rapid injection may be supposed to lead to arterial spasm and trapping of the solution. Arteriography, however, shows that any spasm of a major vessel produced by such stretch can be but momentary; for, if the needle is retained within the vessel and the injection repeated, the full anatomy of the tree is again reproduced. The radial artery is, however, an "irritable" vessel, and occasionally, after arteriography, may go into spasm, with loss of pulse for several hours, but with no ischæmic effects. Clinical experience shows that the superficial ulnar artery is similarly subject to spasm. The intra-arterial injection of thiopentone, except in the case of the ulnar arteries, was not followed by spasm of a major vessel, for the pulse continued at first in full volume.

Thrombosis was the essential pathological lesion; its onset was immediate in the ulnar-artery cases: in one evident after 50 min., in another within 6 hours, and in three it appeared to become complete on the eighth, tenth, and fifteenth day after the injection. Damage to the intima, due to puncture of the vessel, suggests itself, at first thought, as responsible for the thrombosis; but this does not follow arteriography, even when repeated, and when the intima can be presumed to have been scratched. Leriche (1945) reports a case where the femoral artery was punctured 30 times (with tourniquet on) for mercurochrome injections, with no subsequent local thrombosis. Suture of a vessel, including all its coats, is not followed by thrombosis, even in the non-heparinised patient. The small intra-arterial hæmatoma of the vessel wall does not alone cause spasm of a major vessel, as has been said to follow in the traumatic case (Cohen 1944). We can only conclude that the arterial intima appears to be particularly sensitive to thiopentone and solutions of high pH; for it tolerates extremely well hypertonic solutions used for arteriography and various therapeutic substances.

Damage to the intima is the precipitating factor, and microscopy indicates that an aggregation of platelets over the site of the damage forms the starting-point of thrombosis. Where late thrombosis has set in—eighth and tenth day (cases 9 and 11)—histological sections showed that the lumen may be lined with a thick layer of fibrin with a narrow channel through it (figs. 28 and 29); this means that even if the pulse is felt it gives no indication of the volume of blood-flow.

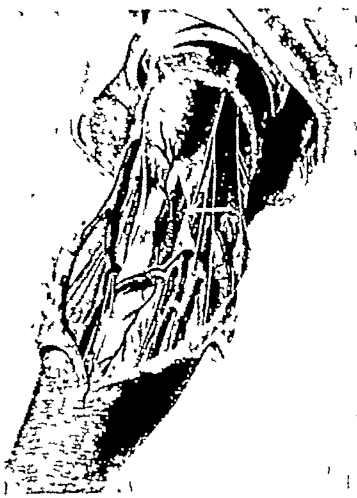
A thrombosis usually extends proximally no higher than the origin of the major collateral vessel next above the site of damage. As already remarked, the high thrombosis in these cases can only be explained by high ascent of the injected solution. This high injection against the flowing arterial stream, as arteriography and experiment indicate, is only possible if there has been arrest of the circulation by clavicular or other co of the subclavian or axillary artery, or failure to releas the assistant's pressure or the rubber-band "venous" tourniquet.

Shunting of the drug into the skin has already been explained as responsible for the sloughing or discoloured patches of skin. The distal forearm a finger are affected according to the distribution of thiopentone. Excretion of thiopentone into the mus will lead to an outpouring of fluid, as with any irritat substance. The exact physico-chemical process wh follows this is still a matter of argument, and Cam (1946) has pointed out that we do not yet know whet it is due to the loosening of the cement substan binding cells together, or a physical alteration in surface membrane lining the endothelial cells.

Where the vessels of supply to the muscles h completely thrombosed, muscle death has followed. T nerve ischæmia following thrombosis has also been sho to be responsible for the nerve effects. Where separ fingers have died, complete blockage of the dig vessels by thrombus has obviously been the cau the clinical evidence of this is the fact that these fing developed no œdema.

Where recovery took place, the digital vessels co only have been in spasm, and these fingers subsequen became œdematous. There is no evidence in man t continued spasm leads to arterial thrombosis.

We still have to explain why terminal gangrene of finger-tips was a feature in several cases; for, as Le (1934) has shown in his studies on Raynaud's dise the entire length of the digital artery is always affe in such spasm, and gangrene of the whole finger is expected. We cannot overlook the fact that in so the cases the extent of finger gangrene correspo to the area where Grant (1938) has shown the arte venous anastomoses to be most abundant. Th anastomoses have thickened muscle walls and are kn to be particularly well supplied with vasomotor nerv they are maintained in a state of rhythmic contractil which has a milking effect and adds impetus to circulation on the venous side, which, in the fing has no "pumping" muscles to promote it. Clotting the venous loop will thus be favoured, if intense sp due to the irritant, is maintained in these anastom Animal experiment shows that during sleep and an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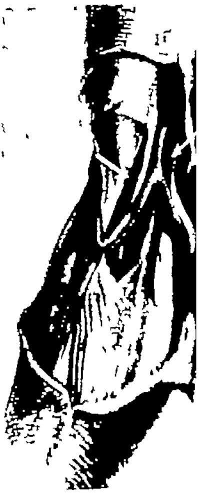
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Fig. 25—Superficial veins at elbow in relation to brachial artery (ar

Fig. 26—Arrangement of veins at elbow when brachial artery di high: ulnar artery pursues, in this case, a subcutaneous cour first and pierces deep fascia. (From Quain 1844.)

ead of thrombosis. It is believed that the arterial lsation plays a not inconsiderable part in driving blood ng the accompanying vein (Clark 1939); since the ombosis is so extensive, elevation will compensate this lack of pulsation.

he importance of assisting the lymphatic drainage by vation, to cope with the œdema of hand and forearm these cases, must also not be overlooked. Courtice 46) in studies of chemical warfare, and Drinker d Yoffey (1941), in studies of burns, have shown, cannulating the lymphatics experimentally, how great y be the return of lost fluid via this circulation.

mperature of Limb

The limb should be wrapped in a sterile towel and vered with wool: it should not be kept cool or exposed the air. Such cooling increases arterial vasoconstriction, d the veins and venules contract as a direct response cold. Prevention of heat-loss from the limb is portant: as the oxyhæmoglobin dissociation-curve ows, oxygen is poorly released at lower temperatures. ith mild warmth, venous tone is diminished and terial pressure is transferred to the venous side more mpletely than when tone is high (Bowers et al. 1945). xcessive heating of the limb with a cradle or by other eans must, however, be avoided, for it is well known at the metabolism of the cells is thus stepped up, creasing their oxygen demands. Pochin (1943) has own that, if the blood-supply to a rabbit's ear is bstructed by placing a wooden plug in the external ar and binding this with wide elastic tubing, œdema bsequently develops on release of the circulation; he extent of gangrene that develops in the ear will epend not on the amount of œdema but on the temperature of the room in which the rabbit is allowed to recover. n a warm room (88°F) gangrene is a common sequel, hough the œdema may be no greater.

Vasodilators

Papaverine, alcohol, aspirin, and other anti-spasmodics have been used in these thiopentone cases with no dramatic improvement. Such measures may be tried: but it is well to note that Davis et al. (1943), after experiments in both normal persons and patients who had recovered from injuries to fingers following severe cold, concluded that "contrary to the general accepted action, as reported in textbooks, none of these drugs (amyl nitrite, nitroglycerin, alcohol) cause any elevation of the temperature in the distal parts or dilatation of the capillary loops."

Experimentally, Laufman and Method (1947) have shown papaverine hydrochloride to be effective in releasing the residual vasospasm following gut strangulation: it is thus reasonable to use it. Intravenous ether 5% in 5% glucose—1 litre dosage—may also be tried.

Surgical Measures

When immediate exploration has not been done, the limb needs most careful watching—as if it were an acute intestinal obstruction—and the decision about exploration must be made within six hours. If operation is decided on, and the patient is already heparinised, an interval of two or three hours is necessary; but the use of protamine as a direct antidote to heparin, or a blood-transfusion, may allow earlier operation; the clotting-time will be a guide. The operation of choice is probably incision of the vessel and extraction of the clot. The vessel should preferably be opened well proximal to the injection site, so that the ultimate suture line of the vessel will not lie within the damaged area. The clot may be extracted with forceps or by aspiration. Experience with emergency embolectomies indicates that, if exploration is not early, the clot is adherent to the vessel wall and suction cannot aspirate it. I have had occasion, in this type of case, to incise the vessel in two of the distal branches and remove the clot by proximal syringing and flushing. This may be a useful expedient in some of the thiopentone cases. A distal intra-arterial injection of heparin should always be given at the time of the operation. After such manipulation of the vessel suture may be difficult, and the attempt to remove the clot may have mutilated the suture line. The operator may be tempted to tie the vessel; but it should be borne in mind that a glass cannula will allow the stream to continue if the patient is heparinised. The cannula may be removed three days later, and will, in the meantime, have given a good stream down and prevented clotting on the damaged intima (Mustard 1946, Cohen 1946b).

I am by no means certain of the value of immediate arteriotomy. The results after brachial embolectomy have caused some dissatisfaction, and opinion in this country no longer whole-heartedly favours it. B. G. Maybury (personal communication) declares, "the best treatment for a brachial embolus is sympathectomy." It may therefore be sufficient to heparinise the patient and try to achieve "medical" sympathectomy by measures such as reflex heating and tetraethyl ammonium chloride. The latter is said to have a selective autonomic block action in 500 mg. dosage (Ballantine 1947), and a well-marked increase in peripheral blood-flow is obtained, despite the generalised vasodilating effect. The associated well-marked fall of blood-pressure is the obvious disadvantage.

Arterectomy (excision of a segment of the vessel as practised in some of the cases, has to my mind no advantage; excision of the entire bifurcation ("triple ligation") usually ends disastrously and should be avoided (Maybury 1946). There is no evidence for the theoretical view that clotting in a vessel holds the collaterals in "reflex spasm" and that arterectomy will release such spasm (Cohen 1944, Lewis 1943).

Late surgical intervention does not seem worth while; all the cases in which late exploration was done fared badly. In view of the extensive thrombosis, operation could only prove of value if a full flushing by multiple arteriotomies and subsequent heparinisation of the patient could be practised. There is as yet no clinical experience for this: and, since microscopical sections show that the intima is severely and extensively damaged, further clotting is likely to take place. In children especially such late operations seem inadvisable. Gross (1945), who has made a close study of embolic infarction in children, emphasises that "occlusion of the large artery in the child at first seems incompatible with the survival of the limb"; yet it is remarkable what a first-class result conservative measures produce.

PROPHYLAXIS

Various suggestions have been made, of which most anæsthetists are aware: spending a moment and palpating and looking for arterial pulsation (Minnitt and Gillies 1944); the selection of a vein outside the cubital fossa or, even better, the almost constant vein over the dorsal and lateral aspect of the radius; and injection of a small quantity of thiopentone and waiting to see if the patient develops pain or not. A knowledge of the abnormalities of the arterial tree on the front of the elbow-joint is now a sine qua non to the anæsthetist. Avoidance of vigorous extension of the elbow, seeing that the venous tourniquet is not too tight, and the insistence on a good light are additional necessary precautions. "An emergency prepared for ceases to be an emergency" is a maxim that might well be engraved on the thiopentone ampoule.

SUMMARY

Eight unrecorded cases of catastrophic results following the inadvertent intra-arterial injection of thiopentone are described; five of these subsequently ended in forearm or arm amputations.

Posterior sympathetic block is not without danger. In case 2 the lung was punctured in the heparinised patient, causing severe hæmoptysis. It is also easy to insert the needle into the dural sheath along the nerve-trunks and to inject the fluid into the spinal canal. I am aware of several tragedies which have not been recorded. Cyriax (1937) in a report on observations made at Leriche's clinic, reported one such collapse; this followed what was believed to be accidental injection into the vertebral artery. Mackey and Scott (1938), discussing the infiltration of the stellate ganglion in apoplexy, describe a case where immediate respiratory paralysis, lasting 30 min., followed such injection "into the vein." Arnulf (1947), in a book on stellate-ganglion block, describes several such tragedies and alarming incidents, which he, however, regards as "exceptional."

The march of events is well shown in a note sent to me by an anæsthetist who tried sympathetic block in one of the thiopentone cases:

> "The patient lying prone, a needle was inserted 2½ finger-breadths lateral to the space between the spines of *C7 and T1.* The patient complained of paræsthesia in the arm; and, after tests for the aspiration of blood and cerebrospinal fluid, 15 ml. of 1% procaine, without adrenaline, was slowly injected.
>
> "There was some complaint of pain in the arm during the injection and, at the end of this, of nausea. He was turned on to his back and found to be unconscious. Respiration ceased, the pulse deteriorated and disappeared. Nikethamide 1·5 ml. was injected intravenously, artificial respiration begun, and oxygen and carbon dioxide administered.
>
> "Patient's condition being grave, the surgeon injected 1·5 ml. of nikethamide into the heart. Almost at once the pulse returned, very full and rapid, and a further 1·5 ml. was given intramuscularly. The time between the cessation of the heart and recovery was 1½–2 min.
>
> "Respiration did not return, and artificial respiration was continued. While this was proceeding, patient's pupils, which had been large and eccentric, became smaller, there were roving eye movements, and his facial muscles above the mouth began to twitch. It was 20–25 min. before respiration restarted, and during this time artificial respiration was continued.
>
> "Movements of the mouth and face now became more pronounced, and there was also cyclical twisting of the head from side to side. The legs were spastic, no jerks could be elicited, and plantar reflexes were absent.
>
> "About 15 min. after the restart of respiration, the picture was that of a cerebral catastrophe; patient's movements became more pronounced, and he was soon throwing himself about the bed most violently, groaning and coughing, with his facial and neck muscles moving. Sedation being imperative, morphine was given.
>
> "Three and a half hours later he was quieter but still tossing his head and unconscious. Four hours after the injection he was far more tranquil and, when spoken to, appeared to understand but could not talk or indicate by gesture that he understood. He now reacted for the first time to painful stimuli—i.e., turned his face away from a pinprick. The legs had become flaccid. The right plantar response, which had been extensor, was now flexor; the left still dubious.
>
> "Seven hours after the injection he was awake, answered questions normally, and complained only of a little nausea. The legs were of normal tone, with the left leg possibly slightly more spastic.
>
> "Subsequent convalescence was complicated by auricular fibrillation (confirmed by cardiologist). A week after the original injection the pulse rhythm had returned to normal."

The brachial-plexus block should probably be repeated at the end of the operation, for a report on one of the cases indicated that its effect lasted less than 4 hours. Amethocaine, because of its long-continued action, should form part of the anæsthetic solution. Brachial-plexus block cannot be repeated after heparinisation, for should the subclavian artery be pierced—always a minor hazard with this procedure—serious hæmorrhage might follow.

General Anæsthesia

Should the operation have to continue, the choice anæsthetic is important. General anæsthesia removes vasomotor tone from peripheral blood-vessels as effectively as does blocking of sympathetic nerves (Abramson 1944). Such peripheral vasodilatation should theoretically cause a steep fall in blood-pressure, an there is a rise of sympathetic tonus in other regions, suc as the great splanchnic area, which compensates an maintains the normal level (White 1935). Craig et a (1932), investigating the thermal changes in the limb during full anæsthesia, found a rapid rise of temperatu in the skin of the hand, with no additional increase nerve-block, indicating complete release of sympatheti tone. Scott and Morton (1930) showed that with nitrou oxide there may be vasoconstriction during the perio of struggle, and it is thus not a suitable anæsthetic f these cases. Cyclopropane has, as regards the circulatio some advantages. Waters (1936) has shown that i anæsthetic concentration it relaxes the peripheral bloo vessels, and Abramson et al. (1941) showed that the was quadruple maximal increase in flow almost immediately after the cyclopropane anæsthesia was begu Deep anæsthesia is not, however, desirable; for, according to experimental work by Mann et al. (1935), th increase in blood-flow in the peripheral arteries, a measured by thermostromuhr, falls to less than 20% with deep anæsthesia, as compared with the 64% rise with light surgical anæsthesia. The fall of gener blood-pressure with deep anæsthesia will affect th blood-flow through the limb.

Morphine and Sleep

Adequate quantities of morphine are required t relieve pain—Goetz (1943) and Wilkins et al. (19 have shown that painful stimuli will cause inte peripheral vasoconstriction—and to relax vessel spas (Learmonth 1946). Sleep inhibits vasoconstrictor tone and during sleep, in the normal person, full periphera vasodilatation is obtained. This has been confirmed b taking thermocouple leads from the toes (Ingram 1936

Forcing the Collateral Circulation

The patient should be kept warm and an attempt mad to force the collateral circulation by immersion opposite limbs in hot water (110°F) or by using a h cradle over the rest of the body. The warmed blo returning from these limbs to the thalamus inhibits th vasoconstrictor tone of the vasomotor centre and lead to dilatation of the peripheral vessels; blood-flow t the fingers, in a normal person, may thus be increase 100 times. Such treatment, however, has not bee successful in these thiopentone cases; nor has it in th intense digital spasm due to high-altitude frostbit Warming the body will sometimes not release the spas in some of the Raynaud's attacks following cold.

Elevation of Limb

The affected limb should be kept elevated to assi both venous and lymphatic flow. Such elevation shoul not, however, be above heart level, and the effect on pai should be observed. "The customer is right" is a soun rule: if the patient complains of excessive pain, th limb should be slightly lowered (Cohen 1946a). point often overlooked, and I have seen it in one of th thiopentone cases, is that, if the patient is permitted t sit up, the pillows must be adjusted to raise the ar to shoulder level (Barnes 1942).

The importance of promoting venous flow cannot b over-emphasised, for experience shows that, shoul venous clotting take place in the limb with sluggis circulation, the fate of the limb will be sealed (Cohe 1946b, Leriche 1945). Gentle finger exercises may b encouraged, but vigorous movement should not b permitted, for such exercise may precipitate the furthe

ACUTE TRANSVERSE MYELITIS COMPLICATING PNEUMONIA

REPORT OF A CASE

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Myelitis, though common in many different infections, rarely a complication of pneumonia. Hassin and Broder[1] eported a case in which the patient died despite treatent with sulphonamides and penicillin, and necropsy owed bronchopneumonia of the right lower lobe and xtreme softening of a dorsal segment of the spinal cord. heppe et al.[2] recorded the history of a naval officer ho, during an attack of primary atypical pneumonia, eveloped an acute myelitis with paraplegia, paralysis f the intercostal muscles, and typical changes in the erebrospinal fluid (C.S.F.); he subsequently recovered ithout sequelæ.

The following case of pneumonia ended fatally because f the onset of a severe transverse myelitis.

A lorry driver, aged 40, was admitted to St. Charles' ospital on April 17, 1947, with seven days' history of spnœa, cough, hæmoptysis, and pain in the left side of e chest.

On admission his temperature was not raised, but his spirations and pulse were rapid. A cough producing pious sticky heavily bloodstained sputum was present. he percussion note was impaired at the left base, with minished air entry and moist crepitations. The abnormal ysical signs became more pronounced next day, and the tient's general condition deteriorated. He looked pale, n, and toxic; his tongue was dry and coated; and though s temperature was still normal his pulse-rate was 100–140 r min. All other systems appeared to be normal. No bercle bacilli were found on repeated examinations of the utum, but one specimen grew predominantly Pfeiffer's cillus. Pneumonic consolidation of the left lower lobe s diagnosed, and 'Sulphamezathine' was given in full ses. After three days the hæmoptysis stopped, and a est radiogram now showed enlargement of the left hilar mph-glands and patchy consolidation in the left lower lobe. blood-count soon after admission revealed a leucocytosis 23,000 white cells per c.mm. (polymorphs 81%, lymphotes 17%, eosinophils 1%, monocytes 1%). The urine was rmal.

On April 21 the patient complained of numbness and gling in both legs. He could not micturate voluntarily, d his bladder became much distended. Voluntary power s diminished in the legs, with patchy loss of all forms of nsation over the lower limbs and trunk. The tendonflexes were normal and the plantar response flexor on both des. Next day, for the first time since his admission, the patient's temperature rose to 101°F, while his pulse-rate remained at 120–140 per min. Blood-pressure 150/100 mm. Hg. An acute transverse myelitis was now obviously present: there was a complete flaccid paralysis with loss of all sensation up to the level of C6, with paralysis of the urinary and rectal sphincters and the intercostal and other respiratory muscles. Respiratory distress was pronounced and it w aggravated by the consolidation of lung.

On April 22 the C.S.F. was slightly turbid; pressure 200 mm. Hg; Queckenstedt test negative; contained 220 white cells per c.mm., with slightly more lymphocytes than polymorphs, and 150 red cells per c.mm.: globulin increased; total protein 320 mg. per 100 ml.; chlorides 680 mg. per 100 ml.; gram film showed pus cells but no organisms; no tubercle bacilli were found in Ziehl-Neelsen film; culture sterile; colloidal gold *test* 5554223210; Wassermann reaction negative.

In a few hours the patient's dyspnœa became alarming, with shallow and laboured respiration, cyanosis, and inability to expectorate. The sulphonamide treatment was supplemented with penicillin, and the patient was placed in a mechanical respirator. There were no signs of improvement however; his fever became hectic in type (99–104°F) and the consolidation spread to the whole left lung. Throughout the illness the spinal-cord lesion showed no change, the level of sensory loss remaining about constant. The patient's general condition occasionally improved temporarily, but the persistence of the paraplegia and pyrexia were of sombre prognosis. The C.S.F. unexpectedly became normal. On April 25 it was still slightly opalescent; pressure 150 mm. Hg; Queckenstedt test negative; white cells 82 per c.mm., lymphocytes greatly predominating; total protein 40 mg. per 100 ml.; globulin only a trace; chlorides 670 mg. per 100 ml.; no tubercle bacilli seen in stained film; cultures sterile. By April 30 it was clear and "water-white"; pressure 150 mm. Hg; 12 lymphocytes per c.mm.; total protein 20 mg. per 100 ml.; globulin not increased. Repeated blood-cultures were sterile; Wassermann reaction and Kahn test were negative; radiography of the cervical spine showed no abnormality.

The patient died on May 15, after remaining in Drinker's apparatus for 23 days, during which time he had two courses of sulphonamides (total 64 g.) and of penicillin (total 17,100,000 units).

Necropsy (Dr. C. E. Bryson).—Unresolved pneumonia of left lung involving both lobes; early abscess formation: right lung emphysematous and purulent bronchitis present. Bladder contained some turbid urine but there was no actual cystitis (a fact worth mentioning considering the number of times the bladder had to be catheterised during life). The mid-cervical cord (C4–D3) was œdematous and very soft, with disorganisation of the grey matter, consistent with an acute transverse myelitis: the central canal was dilated in one segment at the level of C7. Tissues of segments C5, C6, and D1 examined histologically confirmed the diagnosis of acute myelitis.

DISCUSSION

In this case an otherwise ordinary pneumonic consolidation in an afebrile patient, with signs of toxæmia. became complicated by a transverse myelitis affecting predominantly the cervical segments. From the beginning the patient, though relatively young, showed little natural resistance to the illness. The paralysis of respiratory muscles, necessitating the continuous use of the iron lung, was an important factor in aggravating the pneumonic process, and the patient finally died of asphyxia.

At no time did the injured spinal cord show any clinical evidence of recovery, though the acute inflammation, as judged by the C.S.F., may eventually have subsided. The severe hæmoptysis and paraplegia at first suggested tuberculosis, especially since the C.S.F. showed lymphocytic predominance with absence of organisms. It seems probable, however, that both the pneumonia and the myelitis were caused by the same virus. This would explain the initial consolidation without pyrexia, the absence of crisis and response to chemotherapy, and the failure to isolate a causative organism in the sputum.

I am indebted to Dr. A. J. H. Reford for his help in the management of the case.

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Four previously published cases are reviewed; in three of these full operation details and some pathological material have enabled a closer study.

Experience gained from arteriography is used to shed light on factors such as pain on arterial puncture, vessel spasm after injection, and the height that injected fluid will ascend against the flowing arterial stream.

Phlebography indicates that there is considerable distal blood-flow in the forearm when an injection is given at elbow level; the effects and dangers of venous thrombosis are emphasised.

Arteriography and experiments confirm that, to explain the high thrombosis and skin lesions in some of the cases, there must have been temporary occlusion of arterial flow during the injection, either by inadequate release of the tourniquet or by posture of the patient on the operating-table. The mechanical factors likely to obstruct arterial flow at the cervical outlet are described.

Clinical features are discussed: the character of the pain; sloughing cutaneous patches due to thiopentone shunt into the cutaneous arteries; muscle death due to arterial thrombosis; œdema of forearm; nerve effects due to interference with the blood-supply of the main trunks; and late thrombosis.

The effects of thiopentone are held to be due to its high pH. Trapping of the solution in the arterial tree is regarded as momentary, for with small dosage used in some of the cases unconsciousness was only a little delayed.

Extensive thrombosis of the major vessel, and distal arteriolar spasm, are shown to be in the main responsible for the sequelæ. Other mechanisms are discussed.

The variable anatomy of the arterial tree at the elbow is described, and the less serious lesion, following injection into an aberrant ulnar vessel, is shown to be due to the arrangement of the divisions of the brachial artery.

The rationale of the management of these cases is described. Brachial-plexus block is advocated as part of the therapy, and posterior sympathetic block regarded as difficult and hazardous.

If operation has to continue, the most suitable anæsthetic as regards the peripheral vessels is cyclopropane.

Anticoagulant therapy (heparin), in large doses early, is advocated, with exposure and direct injection into the brachial artery, if the anæsthetist is sure of the accident.

Arteriotomy and extraction of clot are probably the operation of choice, the incision being made well above the injection site.

Arterectomy has no physiological sanction and is particularly dangerous if triple ligation is undertaken.

Late exploration is regarded as not worth while.

The local care of the limb is detailed.

Tragedies that have followed the intra-arterial injection of contrast media or therapeutic substances have been collected.

Intra-arterial thiopentone may be hazardous to life as well as to limb.

These cases are in need of intensive study, for they throw much light on the pathological events in the ischæmic limb.

The buffering of thiopentone to render it non-irritating seems within the ken of pharmacologists.

There is urgent need for further experimental work, using larger animals.

These tragedies carry bitter memories for most of the anæsthetists responsible. I have therefore thought it advisable to suppress their names and can merely acknowledge their courtesy and great help in making available to me all the details. To the surgeons who have given me the right to publish their operative findings, and even to criticise from the "touch-line," I can only offer similar anonymous expression of my gratitude; it was felt better for me not to indicate, by naming the surgeons, where such tragedies took place. Human nature, being what it is, is apt to blame and see t faults in others only too readily.

Prof. J. Dible has kindly given me his opinion on the ve sections. Prof. J. Kirk, of Middlesex Hospital, has acted most stimulating fashion as the "backroom boy," discus with me the variable anatomy of the arterial tree and mak available some of Quain's original masterpieces. It is pleasure to acknowledge the cheerful coöperative exp help of Mr. V. W. Willmott, A.R.P.S., of the British Po graduate Medical School, in preparing the photomicrograp and other photographs for me. I am much indebted Mr. J. Robson for the illustrations.

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Continued at foot of next page

THE LANCET

LONDON: SATURDAY, SEPT. 11, 1948

Private Patients in Health Centres

GRATIFYING progress has been made towards the tablishment of an experimental health centre at echford, Birmingham (see p. 428). The local health thority has secured a site, and has prepared plans hich have been approved by the local executive uncil. The local medical committee has promised give the project its full support The doctors ractising in the neighbourhood have discussed the heme. and enough of them to give the experiment ery chance of success would be willing to practise om the centre if terms and conditions of service ere satisfactory. The plans have gone forward to e Ministry for sanction and some first inquiries ave been made as to the conditions of service in e centre when established. Unfortunately, as we oted last week (p. 399), the answer to one of these iquiries threatens to jeopardise all further progress. he Minister, basing his answer on the strict interpre- ation of section 21 (1) (*a*) of the Act, which says at it shall be the duty of the local health authority provide health centres at which facilities shall be ailable "for the provision of general medical rvices under Part IV of this Act by medical prac- itioners," has decided that doctors could not be rmitted to treat private patients at health centres. he local doctors feel they could not take service in he centre if this were among the required conditions. heir objection has been sympathetically received by he local executive council, which has unanimously pproved a report by its general purposes committee eclaring that adherence to this ruling would be etrimental to the health service.

The doctors can bring forward strong arguments on heir side They do not wish it to be believed that hey are offering two standards of service—one for H.S. patients in the health centre; the other omething different. and perhaps better for private atients in their own surgeries. They cannot use their time to their patients' best advantage if they have to duplicate every consulting-hour and be available for one set of times each day at one address and for another elsewhere. Moreover. in these days of domestic difficulties, not least among the vaunted attractions of the health centre was the new feeedom it was said to offer to the doctor's household and particularly to his overworked wife. This is largely lost if consulting-rooms must still be retained, cleaned, and serviced in the doctor's private house while he also attends the centre. If, too, the centre offers, as it should do, a better standard of practice with greater opportunities for mutual help between the doctors practising there, must the patient who has elected to remain a private patient of his own doctor be denied the advantages which the centre offers —always remembering that he, as a rate-payer, is helping to provide them? Lastly, if the doctor is to be required still to maintain private professional premises even though he agrees to work from a health centre, and to pay rent for his accommodation there, he will be facing an extra financial burden which he may find hard to bear. He may regretfully have to refuse the offer of health-centre practice, or the rent for his facilities there may have to be materially reduced below an economic level to allow him to afford the two establishments, in which case the State would in effect, by accepting such token payment for rent in the health centre, be paying a subsidy to help the doctor to provide a separate service at his own surgery for his private patients. This surely is no more defensible than the alternative of allowing the use of the centre for purposes not specifically defined in the Act.

There are theoretical considerations which at first sight might be thought to justify strict adherence to the words of the Act. Undesirable as it is to foster two standards of practice, one inside and the other outside the health centre, even this might be preferable to the risk of encouraging two standards of service, or at least of amenity, inside the health centre. Private patients, it could be argued, if allowed to see their doctors in the centre, would expect prior or better attention than that afforded to patients enrolled under the health service. But need they be given such extra privileges? In the past many doctors have conducted their practices satisfactorily without making distinction in their surgeries or their waiting-rooms between private and panel patients. If in the health centre each doctor is allowed his own suite with its individual waiting-room, he should not find it impossible to continue to give a service satisfactory to both groups of patients, without either group being put at a disadvantage by the other. It might also be objected that problems of administration and remuneration might arise if much private practice was carried out at the centre. The centres will be built and maintained by the local health authority, who will also employ and pay the lay staff. The doctors will use the premises and share the services of the staff. For this they will each pay an agreed charge —probably by a deduction from their remuneration. So long as the doctor's use of the centre is confined to the fulfillment of his duties under part IV of the Act, his share of the expenses is relatively easy to assess, and it could be made to vary directly with the number of patients for whom he has contracted to care. If he is allowed private practice from the centre, it will be very difficult to estimate the demands his practice is likely to make on the centre and its staff; and the calculation of a fair division of expense between the different doctors may well be impossible. But need this trouble the authorities if the doctors can themselves find a way of sharing satisfactorily among themselves, by some partnership or other binding agreement, the over-all charges which are payable for their use of the centre? No greater departure in principle would be needed than has already been made by allowing private practice from State-provided hospitals for the consultant. In fact the same main argument holds good. Mr. BEVAN has defended his action in allowing this privilege to the consultant on the plea that he wished to keep the consultant working inside the service and not having to spend an undue time elsewhere; and that he wished the patient to feel that he could get the best service possible inside premises provided by the National

Reviews of Books

British Surgical Practice

Vol. III. Editors: Sir ERNEST ROCK CARLING, F.R.C.S., F.R.C.P., consulting surgeon, Westminster Hospital; J. PATERSON ROSS, M.S., F.R.C.S., director of surgical clinical unit, St. Bartholomew's Hospital, and professor of surgery in the University of London. London: Butterworth. 1948. Pp. 561. 60s.

WE have already reviewed the first two volumes of *British Surgical Practice*.[1] Volume III is no disappointment. It contains 63 sections, beginning with "Cæsarean Section" and closing, appropriately, with the "Eyelids." The ear, the eye, and endoscopy account between them for 28 sections. Some of the articles are better than others, but there is not a bad article in the book. The uniform lucidity of contributions by more than 50 authors is a great tribute to the editors, and the illustrations are numerous and good. It is clear, as the successive volumes emerge, that this work is achieving the very difficult and ambitious task which it set out to accomplish—to present an up-to-date and authoritative survey of British surgery.

Diagnostic Procedures in Virus and Rickettsial Diseases

Editor: T. FRANCIS, jun. New York: American Public Health Association. 1948. Pp. 352. $4.

To diagnose most of the virus diseases described in this book, inoculation of animals is needed on a scale practicable in this country only in the better equipped research institutes. To diagnose others, however, much may be done by the use of fertile eggs and by various in-vitro tests. The authors of the chapters in this book are all experts and describe in great detail methods of working with their own special viruses—methods which will often not be possible except to specialists. The transmission of mumps to monkeys, or of sand-fly fever to human volunteers, for instance, are never likely to be counted regular "diagnostic procedures." The precautions necessary to avoid infecting laboratory staff are described, and some instructions are offered on the proper care of laboratory animals. The account of psittacosis by Meyer and Eddie is particularly good. That by Rake on lymphogranuloma venereum inflicts on us an unaccustomed binomial nomenclature: we are asked to call the virus *Miyagawanella lymphogranulomatosis* (it seems unlikely that many of us will). Parker's chapter on variola and vaccinia is less full than most, and does not mention hæmagglutination. That by Feller on primary atypical pneumonia tells much about cold agglutinins and agglutination of the MG streptococcus—both far from being pathognomonic tests—but little about the virus described by Eaton and his colleagues. But most chapters—on mumps, poliomyelitis, encephalitis, herpes simplex, and so on—are very good. The writers are highly individual, and there is some overlapping and perhaps even a little contradiction in the accounts by different authors of similar techniques; but the book is a valuable reference work for those engaged in research and in public health.

Calcium and Phosphorus in Foods and Nutrition

HENRY C. SHERMAN, Mitchell professor emeritus of chemistry, Columbia University. New York: Columbia University Press. London: Oxford University Press. 1947. Pp. 176. 15s.

MUCH work has been done on calcium and phosphorus metabolism since Professor Sherman wrote the first edition of his *Chemistry of Food and Nutrition*; and few have so good a claim to bring the subject up to date in a book with a fairly general appeal. He begins by explaining why there is a nutritional problem connected with calcium and phosphorus: the animal is born with so little and needs so much that food which is otherwise satisfactory may fail to meet the body's requirements. There follows a general account of the calcium in the body, its combined forms, and its functions in the bones and tissues, which leads to an excellent study of the effects of food and growth on the body's calcium content. He deals well with the vexed question of calcium and phosphorus requirements and the problems of and optimal intakes, but is not so happy when discuss why some foods supply calcium more readily than oth

Professor Sherman is at his best when dealing w the relationship between intake and retention, point out that passably normal health can be maintained— a lifetime and even through successive generations— very different levels of calcium intake and outp and on somewhat different concentrations of calci within the body. He then marshals evidence to show t a high intake of calcium is always beneficial, even elderly people, and that 1 g. a day is a good all ro figure, with rather more for adolescents and for pre and nursing women. In his view, an excess, w reason, has no pathological consequences, but not eve body who believes this has the courage to say so, many will recall from the controversy that arose h over the addition of calcium to flour.

There are a few weak points in the book; Profes Sherman implies that phosphorus deficiencies are uncommon in infancy, which seems improbable, and ideas about rickets may be applicable to the rat but scarcely be accepted as applying to man. There ar few serious mistakes (adenine is numbered among pyrimidines rather than the purines) and some omissi which workers in this country will find difficult to exc Thus the rôle of phytic acid in calcium metabolism its importance in cereal diets are not discussed, thou quite a lot is said about the oxalic acid in spinach and effect in making the calcium in this vegetable relati unavailable. Some reference to the fundamental w of the Mellanbys seems essential in a work of this ki but this and the pioneer work of Miss Harriette Chi on osteoporosis in middle-aged people are omitted. these defects were corrected the book would be o of the most valuable introductory monographs nutritional science.

About Cosmic Rays (London: Sigma Books. 1 Pp. 144. 8s. 6d.).—In this volume of the Sigma Introduct to Science series Mr. John G. Wilson, PH.D., gives a clear a concise account of the discovery of cosmic rays, and the fac established and theories elaborated about them. The Ge counter and the cloud chamber, and the ways of using the are fully described and illustrated. This book can be thoroug recommended to those interested in atomic physics.

Hernia (3rd ed. London: H. Kimpton. 1 Pp. 700. 67s. 6d.).—Surgical books are of three typ there are textbooks giving orthodox teaching, monog recording the views and experience of an author, encyclopædias which profess to cover the whole of a sub but should nevertheless make some attempt to separate chaff from the wheat. This book by Dr. Leigh F. Watson, Los Angeles, sets out to be an encyclopædia of hernia surge and it contains as much as the industrious author can between two covers. "Nature's method of preventing t protrusion of viscera into a preformed sac consists of provi ing an oblique canal"; "in inguinal hernia the portion of t sac lying within the inguinal canal is called the neck"; "acute coronary thrombosis is sometimes mistaken for a sm occult strangulated hernia"; "in infants the obliquity of t inguinal canal is slight, because it passes almost direct through the abdominal wall"; "direct inguinal hernia infrequent"; "new growths in undescended testes rare"; "in Great Britain the simple ligature of the s operation in young infants is usually performed in the O Patient Department": such statements abound. Dr. Wats seems hazy about the ætiology of indirect inguinal hern At one time he says "it is generally believed that all indire hernias are due to a preformed sac," at another, "in indire inguinal hernia the sac first bulges at the internal ring . . . removal of the tension the peritoneum quickly resumes normal shape . . . on continued repetition of the strain t ring gradually relaxes . . . the peritoneal pouch finally ceas to return into the abdominal cavity." On p. 130 the pr formed-sac theory is given, while on p. 131 the balloon theo is illustrated in all its crudity.

The account of operations is slightly better, but is marre by lack of discrimination, and by a passion both for the ne and bizarre, and for the old and quaint. Murphy's button advocated, and even Moynihan's bone bobbin, that wen out of use in 1906. Dr. Watson himself seems to like injectin hernias; he may be right.

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[1] *Lancet*, 1947, ii, 912 and 1948, i, 678.

e all characteristic of human nutritional anæmia it not of pernicious anæmia. Indeed, CARTWRIGHT' id his associates were surprised that their liver tract (which contained no significant amount of lic acid) produced any response at all, because the et contained adequate extrinsic factor and pig's omach is one of the richest sources of hæmapoietin. A similar anæmia has been artificially produced in ts by Dr. WATSON and his colleagues in Prof. L. J. ITTS's department at Oxford. Their technique, hich they describe on p. 404, was to fashion an testinal short-circuit and leave a blind loop; the perative mortality was lowest with a 3-in. loop at filled with peristalsis. The bone-marrow in their nimals also contained abnormal erythroblasts resembling megaloblasts. This rat anæmia, too, resembled a utritional rather than a pernicious anæmia, and in the bsence of infection large doses of a purified liver extract roduced a remission; a single injection of folic acid as tried in one rat which had responded only partially o liver extract, and its hæmoglobin and red-cell ount rose to nearly normal.

Here then are experimental techniques that should t least enable us to find out how folic acid acts in egaloblastic anæmias. There seems little doubt that he odd erythroblasts found in the animals' bonenarrow are of megaloblastic type and are not hyperlastic normoblasts since we know that the latter are ot affected by folic acid. The results suggest that here are several ways of producing megaloblastic hange in the marrow; it may be—as WELCH [4] has uggested—that folic acid and the anti-perniciousnæmia liver principle bring about superficially imilar results by different paths. The discovery of itamin B_{12} may mean that there are several subtances that can restore megaloblastic marrow to ormoblastic. But it is tantalising that when the xperimental megaloblastic anæmia—so long striven or by so many workers—has in fact been produced, it is still not of a type that can be used for the standardisation and assessment of liver extracts for the reatment of pernicious anæmia.

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[4] Welch, A. D. *Fed. Proc.* 1947, 6, 471.

International Industrial Medicine

NEXT week more than 700 delegates from 46 nations will attend the Ninth International Congress on Industrial Medicine at the Caxton Hall, London. It is sponsored by the Commission Internationale Permanente pour la Médecine du Travail, which was founded in 1906 as a private society of industrial physicians by LUIGI DEVOTO of Milan; and it is a fitting tribute to BERNARDINO RAMMAZINI, one of the greatest of industrial physicians, that his fellow-countryman should have inspired this international society more than 200 years after his death. The commission now has a permanent committee in each country where industrial medicine is being practised on a large scale. The British committee are the hosts for this congress, the first to be held in Great Britain. The work of the Commission Internationale has often been wrongly associated with that of the International Labour Office, which is officially sponsored by governments, employers, and trade-union organisations in the New and Old Worlds The I.L.O. probably has made the greater contribution to international industrial medicine by adopting codes of health, safety, and welfare in industry, which it has supported by collecting and disseminating information of international interest. These two bodies exemplify in different ways the efforts made officially and privately to overcome the difficulties of travel and strange tongues and to break down the national frontiers of medicine. Prof. L. CAROZZI, the commission's secretary-general in Geneva, has held together this international fellowship in spite of the long years of war and shortage of funds.

Since the last congress,[1] held in Frankfurt in 1938, there has been a fundamental change in the subjects for discussion, from a limited academic approach to one which not only covers a much wider academic field but is essentially realistic. In 1938 there were 3 sections: occupational diseases, industrial accidents, and a combined section which dealt mainly with predisposition to industrial-disease and disability. In the forthcoming congress there are 6: social aspects, occupational environment, medicine and toxicology, nursing, industrial medical practice, and a special section with sessions on the medical content of law and the application of legislation. The congress of 1948 clearly means business. It will discuss the training of industrial medical officers and nurses, and the organisation of industrial medical services. Methods of controlling industrial health hazards are now well established, but they need to be refined and modified so that they may be applied as widely as possible, particularly to the small workplaces which now have little or no continuous health supervision. This is a problem of organisation which might well be raised in the congress discussions. All industrialised countries must face it, for the small workplace is still the backbone of world industry. Industrial accidents as a cause of disability still outweigh occupational disease in importance. High standards of safety engineering alone can never successfully control the human factors responsible for most accidents. Yet the original work by GREENWOOD and WOODS [2] and by FARMER and CHAMBERS [3] on accident-proneness has had very limited applications. Industry and Government must still support fundamental research and not rely too much on established methods.

In the first place medicine served industry by helping to control disease and treating industrial injuries, and these services are still important today, particularly where the risks of accident and industrial disease undermine the health and morale of a particular group, such as coalminers on whose output European recovery largely depends. But the changed concept of industrial medicine's rôle is well illustrated in next week's programme. It includes socio-medical and psychological problems of incentives, work, and skill Wisely the organisers have included contributions from psychologists and sociologists; for health and efficiency in industry are no longer the prerogatives of doctors, who have welcomed these scientists as colleagues in the battle to raise production. If medicine in industry is to survive and grow there must be radical changes in the training of students and industrial medical officers. So long as

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[1] *Dtsch. med. Wschr.* 1938, 64, 1784.

[2] Greenwood. M., Woods, H. M. *Ind. Fatigue Res. Bd Rep.* no. 4, 1919.

[3] Farmer, E., Chambers, E. G. *Ibid.* no. 38, 1926; *Ibid.* no. 55, 1929.

Health Service. Surely the aim should be to give the doctors and their patients, whether health-service or private, the best facilities in general as in specialist practice—and this must mean giving them all access to health centres.

What is needed now is the early establishment and trial of some experimental health centres. The emphasis must be on experiment. No more than a few trial centres are at present feasible. Experiment should be not only in shape, site, or building materials but in ways of running the centre and of ensuring successful cooperation between the patient, the doctor, the lay staff, and the health authority. Can we not as part of our experiment try out the effect of having private patients attending health centres? The risk of their swamping the centre and making undue demands on it is minute. The very small proportion of the community who have elected to remain private patients have mostly done so to avoid *having to come to see the doctor: they think it worth* paying their fees so that they can still ask him to call for their own convenience. If the experiment *showed that private practice in the centre was* incompatible with the successful conduct of the centre's other functions, this sanction could be withdrawn before wider health-centre provision was embarked upon. If, on the other hand, the plan was found to work happily, then one of the major obstacles to coöperation by the doctors would have been removed. What is important now is that the Birmingham experiment, which looked so promising and which could still provide a valuable testing ground for our theories, should not be stillborn because of failure to secure agreement over this one point of controversy.

Experimental Megaloblastic Anæmias

THE discovery that folic (pteroylglutamic) acid will cause human megaloblastic *anæmia to remit and* transform the pathological megaloblastic marrow to a normoblastic state has not, so far, simplified our *understanding of the pernicious group of anæmias.* On the contrary, a host of new problems has appeared. The evidence makes it clear that neither folic acid nor its naturally occurring conjugate (pteroylheptaglutamic acid) is CASTLE's extrinsic or intrinsic factor —WILKINSON's hæmopoietin. Folic acid relieves the anæmia of sprue, but the failure of fat absorption remains; it will produce a normal blood picture in pernicious anæmia but leaves the neurological part of the syndrome unaffected or worse. Various theories to account for the action of folic acid have been suggested, but they are difficult to test in human disease. It is not therefore surprising that renewed attempts have been made to induce *suitable* experimental anæmias in animals. These experiments have been helped by the discovery of a folic-acid antagonist in the *form* of a methylfolic acid.[1] When this antagonist is given to rats the resulting changes in the blood and blood-forming tissues are similar to those produced by a purified diet with succinyl sulphathiazole to prevent bacterial synthesis of folic acid in the intestine. Neutropenia, and not anæmia, is the prominent part of the rat syndrome, so other animals have been tried. The pig has long been
regarded as peculiarly suitable for experiments
at reproducing human anæmias. WELCH, HEINLE
and co-workers[2] fed three pigs on a purified
free from CASTLE's extrinsic factor but containing
cinyl sulphathiazole and folic-acid antagonist. T
claimed that the animals developed a macroc
anæmia with curious changes in the bone-ma
resembling the megaloblastic change seen in hu
disease. One of their pigs responded promptl
intramuscular injections of folic acid, one to a mix
of folic acid, liver extract, and nicotinamide, and
to liver extract alone. This was a surprise
chicks, rats, and monkeys with folic-acid defici
do not respond to liver extracts.

These pig experiments have been repeated u
somewhat different conditions by CARTWRIGHT
others.[3] They fed four pigs on a diet low in pro
but containing adequate extrinsic factor; they
folic-acid antagonist and succinyl sulphathiazol
before, *and they also took the precaution* of preve
their pigs from getting any folic acid for 3–4½ mo
before the experiments began. The diet did not con
any folic acid, p-aminobenzoic acid, or inositol. F
other pigs received the same diet plus these mis
factors and were not given folic-acid antagonis
succinyl sulphathiazole. This group served a
control and they showed no changes apart from
retardation of growth because of the low pro
content of the diet. The four pigs did not appre
their régime. They became weak and listless,
appetite fell off, their coats lost shine, their abdo
sagged, and their squeals became faint and w
They had diarrhœa, and growth was poor. In
weeks the animals developed an anæmia which sl
became macrocytic, and the granular leucocyte
the blood diminished. But the most striking cha
were in the bone-marrow; here the erythrob
were increased and the granulocytes proportion
reduced; in addition to the normoblasts
appeared 11–22% of abnormal erythroblasts cl
resembling the megaloblasts seen in human perni
anæmia. *These megaloblast-like cells had* not
seen in the marrow of animals rendered anæmi
bleeding, nor did they occur in the marrow of
control pigs. When a purified liver extract in relati
large doses was given to these pigs the resp
varied: one pig showed no change at all, where
two others there was a partial remission of the ana
but the bone-marrow still contained megalobl
Folic acid, on the other hand, produced a ty
reticulocyte response with remission of the anæ
and megaloblasts disappeared from the bone-mar

The importance of these American experimen
that for the first time an experimental megalobl
anæmia has been produced—a result attempted
not attained by various methods of resectio
stomach and intestine in pigs. This experime
anæmia syndrome resembles human sprue or tro
macrocytic anæmia rather than pernicious anæ
—the signs of nutritional failure, diarrhœa, pa
conversion of the marrow to a megaloblastic state,
partial response to large doses of purified liver ext

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[1] Martin, G. J., Tolman, L., Moss, J. *Arch. Biochem.* 1947, **12**, 318.

[2] Welch, A. D., Heinle, R. W., Sharpe, G., Epstein, M. *Proc. exp. Biol., N.Y.* 1947, **65**, 364. Heinle, R. W., Welch, A. George, W. L., Epstein, M., Pritchard, J. A. *Proc. cent. clin. Res.* 1947, **20**, 7.

[3] Cartwright, G. E., Fay, J., Tatting, B. S., Wintrobe, M. *J. Lab. clin. Med.* 1948, **33**, 397.

r a verdict. but the sceptically minded will run h the "results" without much conviction.

practical usefulness of any system of statistical : cannot be too frequently or too insistently)ned. We live in an age when the urge towards llection of statistical data can easily run riot. here is danger that time and trouble may be it fully justified if it produces data not previously ole, irrespective of their practical usefulness. It be a great help therefore if we could have from mmittee responsible for this latest and admittedly urvey a direct and positive statement of the con- is they draw. Do they, in the light of their local edge, feel that the results they have set down sufficient practical importance to warrant further ment along these lines? Is this analysis of an g hospital service really a help in deciding what to be, or will be, provided *tomorrow*? The ation of the survey unaccompanied by the com- 's own verdict may lead others to follow suit it a clear perception of the ends likely to be ed.

POISONOUS BERRIES

IOST every summer brings its crop of accidents, imes fatal, through the consumption of poisonous s, often mistaken for blackberries. This summer exception. The account, on page 438, of two nts of this sort in the south of England is, how- notable for the survival of the children who con- l the berries of the Deadly Nightshade, while the who ate those of the usually less poisonous Woody shade died.

the nightshades belong to the family solanaceæ are more or less poisonous, except Enchanter's shade (*Circæa lutetiana*), which belongs to a ent order and is not poisonous. Two genera of olanaceæ are found as weeds in England—atropa solanum. *Atropa belladonna* is considerably rarer the several species of solanum and thus provides cases of poisoning; this is fortunate because all arts, especially the berries, are poisonous and it up to its popular name of Deadly Nightshade. solanum weeds include *S. dulcamara*, the com- st, and *S. nigrum*, whose folk-names are somewhat dled; *S. nigrum* is called Common Nightshade, k Nightshade, Woody Nightshade, and Bittersweet, last two names being shared with *S. dulcamara*. ivated species include *S. tuberosum* (potato), and *copersicum* (tomato). The poison has been found in pe potatoes and in the young shoots, leaves, and stems ie plants. Another cultivated solanum, the Wonder- y, something like a large bilberry, was discarded after its introduction some thirty or forty years ago, ugh fear of possible poisoning. For the same reason iatoes were long cultivated as ornaments, under name of Love Apples, before they were eventually epted as food.

he active poison of Deadly Nightshade is atropine, that of Woody Nightshade and Black Nightshade mine. Deadly Nightshade may be distinguished by corolla, which is bell-shaped, whereas those of the num nightshades resemble the potato plant's. The ies of Deadly Nightshade are black, shiny, and about arge as a cherry. Bittersweet (*S. dulcamara*) has a dy stem, alternate cordate leaves, and red oval ies ½ in. long, and it straggles over other plants in ges and thickets. Its drooping clusters of flowers are ie on a stem which usually arises opposite a leaf. petals are either white or lilac-blue with a green spot he base of each surrounding a yellow cone of anthers; poison is chiefly concentrated in the berries. The d stems are official in the *British Pharmaceutical* x. There is a maritime variety with a prostrate stem. lack Nightshade (*S. nigrum*) has white flowers and k globular berries, which are also poisonous, about the size of haws. Its stem is not woody and its leaves are ovate. Varieties with red and with yellow berries are known, such as the Jersey variety with dentate leaves and scarlet berries.

When it is suspected that a child has swallowed the berries of one of the solanum family, what should be done? For practical purposes all solanum berries are poisonous. The immediate necessity is to empty the stomach as effectively as possible; remembering that whole berries or large fragments of them will usually not pass through a stomach-tube. Thereafter the child should be kept under close medical supervision, preferably in hospital.

AN EAGLE IN THE DOVECOTES

"THERE is no force so great as that of an idea whose hour has struck," Mrs. Margaret Sanger quoted, at the congress on *Population and World Resources* reported in these columns last week. She might have added that the force of an idea derives from human personalities—sometimes, it almost seems, from one personality. She was recalling the history of family planning in America, of which she has been the pioneer. In Great Britain we have been fortunate in that family limitation has never been regarded as a crime. Things were different in America thirty years ago, when Margaret Sanger is reported to have "appeared on the horizon with three children in her arms and a wild look in her eye." She had been working among the poor in New York, and had been dismayed at the unnecessary burden and suffering borne by women, and dreaded by them for their daughters, in slums where pregnancy followed pregnancy and poverty deepened with each child. She was ready to challenge the Comstock laws which for thirty-five years had blighted free discussion of human relations and sexual ethics. Anthony Comstock, she said, had ideas about purity and was determined to enforce them. Abortion, even on therapeutic grounds, the practice of contraception, and the sale of contraceptives or of publications about contraception were punishable by long imprisonment and heavy fines. Since it was illegal to send any printed matter about contraception through the post, a large government staff was kept busy opening other people's letters and parcels. An editor of 70 was sent to the penitentiary for starting a journal—"Dr. Blacker please note"—called the *Eugenics Review*. The same fate befell the editor of a free-thought weekly, because he challenged Comstock. Margaret Sanger was indicted for publishing a little monthly insisting on the right of women to space their families. She was determined to tell them how to do it, too, but a hunt through the libraries for information produced only a small book pointing out how wonderful it was to have children.

Conditions in a city which prided itself on its municipally owned apartment houses were a cynical comment on this find: the apartments were built to take parents with no more than four children; if they exceeded the ration they were asked to move, and by the time they had seven or eight they were living down in the shipyard slums. Margaret Sanger's trial was postponed, and she seized the moment to write a pamphlet on family limitation, which was printed and packed up for mailing before she sailed for Europe to prepare her defence. When she was well in the middle of the Atlantic the pamphlets were posted, the recipients including the judge, the district attorney, the President, and Mr. Anthony Comstock. In England she was welcomed by a group of warm admirers, Havelock Ellis, H. G. Wells, Edward Carpenter, Gilbert Murray, the Drysdales, and Dean Inge among them. By the time she returned for her trial feeling in the United States was so strongly in her favour that the case was dropped. "I am sure Mrs. Sanger won't do this again," said the district attorney. "I assure you I shall," she replied, and soon afterwards opened, in New York, the first practical birth-control medical students are taught about the rare diseases rather than about sick human beings who have to work, their interests in occupational medicine, both as general practitioners and doctors in industry, will be confined to the treatment of industrial injuries and the investigation of industrial disease. They must be interested in the material and psychological factors which affect the health and efficiency of every working community, not only those inside factory gates and down mines. On their own doorstep the medical profession have the urgent problem of attending to the health and welfare of nurses, the shortage of whom reflects the sad neglect of attention to their working conditions in hospitals. With such an extensive programme there is some danger of these sessions remaining uncoördinated and sealed in water-tight compartments. Improved health and efficiency at work depends on the combined efforts of doctors, engineers, physicists, chemists, psychologists, and industrial nurses. Every effort should be made to integrate these disciplines as far as possible. This can be done to some extent by unofficial discussions, it is perhaps unfortunate that there is no final session to bring the different experts together in discussion.

In this country, growing social security and great demands for production have happily r the evils of want and starvation, but at the time that most powerful of incentives—work want—has lost its force. Industry must find incentives. "Why men work" is a question w can never be easily answered. Experiment research, however, have shown that the human r tions of working groups, be they industrial, c mercial, or educational, have profound effects on urge to work. Speakers on incentives have the congress lists for the first time, and it is to hoped that this congress will stimulate further into human relations and will initiate practical ments in managing human beings in industry. this sphere more than any other the combined of the medical and social sciences can contribute to the *promotion of health and increased production*

Annotations

HOSPITAL-TREATED SICKNESS

STIRLINGSHIRE has been submitted to the punch-card operation. The Glasgow Health and Sickness Bureau which, like its sister in Oxford, works under the auspices of the Nuffield Provincial Hospitals Trust, has prepared a special card in respect of each Stirlingshire patient treated in the year ended Sept. 30, 1947, at a hospital, whether inside or outside the county, and whether inpatient or outpatient. The object was to obtain "a complete picture of all types of hospital-treated sickness occurring among the known population of a given area," and Stirlingshire was chosen as fairly representative of the urban industrial belt of central Scotland. The committee responsible for the study had Prof. Thomas Ferguson as chairman, and nearly all its members were medical men. The report[1] briefly describes the methods used, and sets forth the results, analysed from various angles. The tables show the total volume of sickness treated in hospital (one in every seven of the population received hospital care in the year), the type of sickness and duration of stay in hospital, the geographical factors in hospital treatment, an analysis by age and sex of patients, and so on. There are also supplementary notes on various disease groups, indicating the incidence of diseases per 1000 of the population. The bureau is now engaged on a similar inquiry in the larger and more populous county of Ayrshire. It is suggested that the experience of the Oxford and Glasgow bureaux may be helpful when, as is presumably intended, the regional hospital boards come to build up machinery for keeping and analysing hospital records on standard lines. When this has been achieved "the community should have available reasonably sound guidance about basal hospital facilities that should be provided."

The appearance of this survey offers an opportunity to consider a very wide question. What kind of hospital statistics would really justify the considerable labour involved in their compilation? The Ministry of Health, wisely, has not as yet given any indication of the type of statistical material likely to be required. Miss Nightingale, on her return from the Crimea, was painfully impressed by the lack of scientific coordination in the statistics prepared by the various London hospitals, and for a while she bent her energies towards the introduction of model statistical forms. The general adoption of her forms, she wrote, would "enable us to ascertain the relative mortality in different hospitals, as well of different diseases and injuries at the same and different ages, the relative frequency of different di and injuries among the classes which enter hospital different countries and in different districts in the countries." Her scheme failed—the difficulty costliness of compilation, and the doubt about the v of the conclusions deduced from such figures as then published, were no doubt responsible for a gradual loss of interest on the part of the hospitals. Are we much further forward today than in the 1860's? The statistical returns required by King Edward's Hosp Fund for the last fifty years and adopted by many the hospitals in other parts of the country have afford much useful financial data, and have been a mine information on numbers of patients treated, duration stay, and so forth. But these returns have stopped short of Miss Nightingale's ideals, and the classificat of diseases has lain outside their scope.

It is claimed for the Stirlingshire survey that it shou be of service, "as a basic record of hospital faciliti actually available and used, in shaping an approach t broad administrative problems of hospital policy, by throwing into relief the general pattern of hospital-treate sickness and suggesting lines of medical and administra tive research." It is fair then to ask whether the pilo survey did justify the collection of further data o similar lines. Does the use of a simple card transcribe from the hospital records and fed to the new mechanica sorting devices offer informative results? Do thes results go beyond what can be deduced by simple means, such as those used in the hospital surveys The latter depended on data of the usual kind regardin the existing hospital facilities, the number of bed available, the occupancy and so on, supplemented by visits to many of the hospitals and a broad assessmen of needs based on verbal information as to the pressur on particular categories of accommodation. The waiting list is a notoriously unreliable guide, but indications o pressure in one direction or another, such as can b obtained direct from the hospitals, is a very relevan factor. The Stirlingshire survey is based on the assump tion that the new mechanical methods can offer dat not hitherto available to those who have to plan th hospital services of the future. Without a detailed knowledge of local conditions it would be presumptuou

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[1] Hospital and Community. 1. Hospital-treated Sickness Amongst the People of Stirlingshire. 1948. Pp. 96. 3s. 6d. Nuffield Provincial Hospitals Trust, 13, Mecklenburgh Square, London, W.C.1.

Special Articles

COMPENSATION FOR INJURY *

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HE present system of dealing with claims for com- sation for injury is unsatisfactory, and the National rance (Industrial Injuries) Act, 1946, will perpetuate e of its weakest features.

nder the present system an injured workman, after rting the accident to a representative of his employer, sults his panel doctor, who furnishes him with a ificate on which weekly compensation is paid. If e is any dispute the workman consults a solicitor, formulates a claim. In the event of the employer's sting the claim the case goes to arbitration, with the luction of opposing medical evidence and occasionally assistance of a medical referee. Common-law cases w a more or less similar course, save that they are in the High Court, and it is a question of damages er than compensation.

orkmen's claims under the new Act will be dealt by an industrial pensions officer. They must be mpanied by a medical certificate, and the applicant have to submit to examination by an appointed ical officer. The decision of the pensions officer be subject to appeal to a local appeal tribunal of loyers and workmen, with two coöpted medical titioners when necessary. The medical assessment pension will be made by a medical board, probably medical board of the Ministry of Pensions. There be a right of appeal against a final assessment to ibunal consisting of a chairman of a local appeal unal, and two medical practitioners. There is no p-sum compensation under the new plan.

THE CLAIMANT

he great majority of British working men and women, g normal healthy people, remain on the compensation s short a time as possible. They would feel ashamed ake a penny under false pretences, and are only anxious to continue working if possible. There however, many circumstances which may influence normal people to persist in a claim after they recovered, and there is always a proportion of rmal people among the injured. For instance, Workmen's Compensation Act makes no allowance a man's running into debt, and this is inevitable if incapacity lasts at all long. He is then faced with ars of payment to tradesmen which it would take rs to pay off out of his normal wages; and, unless ump sum is forthcoming, he feels that his only chance o persist with some complaint or other till he gets ress. During and since the war many people, parti- rly married women, have been forced into occupa- s which they dislike and naturally welcome a chance vading. Many other cases are probably psycho- hic misfits, self-centred, lazy, and mutinous, who lag nd or lack the skill to compete on even terms with r fellows.

THE DOCTOR AND DIAGNOSIS

he first doctor consulted by the claimant is of funda- tal importance, and often it rests with him whether e is a claim or not; and, if there is, whether it is l or not. Even today many doctors in the poorest ricts are not sufficiently independent and are con- isly or unconsciously influenced in giving certificates. he diagnosis in many cases of injury may be simple, prognosis is always difficult and may be impossible without specialist training. It is, however, on the prognosis that the case may be fought. Moreover, even the simplest case may be complicated by exaggeration or malingering. The doctor can scarcely be blamed for playing safe in cases of doubt. His remedy is to get a second opinion when the doubt warrants it.

It is most important to obtain a correct history of any accident. In most instances the type and degree of violence are directly related to the effects and could be predicted, or conversely the violence could be assessed from the effects produced. For example, many types of fracture, such as the fracture-dislocations of the ankle, are now known to be related to particular strains or types of violence. The converse is not so well established, and it is always of great value to elicit as far as possible the direction and degree of any force acting in any particular case, and to observe whether the description tallies with the alleged effects or not.

Case 1.—A man reported that he had fallen aboard ship and injured his right shoulder two months earlier; he had been radiographed at a cottage hospital and told that there was a fracture of the upper end of the humerus. He had been transferred to another local hospital, where radiography had been alleged to show fracture of the glenoid also. The patient had provided himself with copies of the radiological reports.

Careful and critical elucidation of the history of the accident revealed that he had fallen flat on his back. Examination showed extraordinary development of the muscles of both shoulders, more particularly those muscles concerned in movements of the shoulder blades, and that this abnormal development was equal; there was no wasting on the injured side; movements of the injured shoulder were free but not carried out at the true shoulder-joint but by means of an extraordinary or abnormal movement of the shoulder blade, so that in full abduction of the arm the lower angle of the bone projected two or three inches beneath the skin. In other words there was complete fixation of the true shoulder-joint. This conceivably could have followed a fracture of the upper end of the humerus with or without the glenoid, but the unusual development of the muscles and the wide range of movement had obviously been gradually developing for a much longer time than two months. Routine examination of the other shoulder disclosed complete fixation of the shoulder-joint with a full range of movement by means of abnormal shoulder-blade movements.

This strongly suggested that there was some identical cause for the similar condition in both shoulders and threw strong doubt on the probability of any accident. Radiography of both shoulder regions showed that the upper ends of both humeri and the glenoid cavities of each scapula were greatly deformed. The upper ends of the humeri were reduced to mere points, and the heads of the bones had run down the shafts like melted wax. A similar appearance was seen in the glenoids, and it was diagnosed as a type of melorheostosis of Leri. There was no sign of fracture or injury.

Errors in diagnosis were made in this case by not eliciting a correct history, and by neglecting to follow the routine principle of comparing one limb with the other.

A much more serious result of wrong diagnosis in the initial stages is delay caused by neglect or by incorrect treatment, as in the following case:

Case 2.—A workman fell and sustained a fracture-dislocation of his shoulder.[1] The dislocation was missed on radiography at the cottage hospital. The arm was bandaged, and later the patient was referred to an orthopædic surgeon, who discovered the dislocation by radiography but too late to reduce it. At the arbitration compensation was refused on the grounds that the negligence committed in the cottage hospital constituted a novus actus interveniens; hence the present incapacity was due substantially to bad medical treatment and not to the original injury.

THE SOLICITOR

Whereas the doctor takes a rather detached view of any question of compensation, the lawyer jealously watches his client's economic interests. In many instances solicitors have been grossly misled by medical certificates

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ridged from a paper read to the Wrexham and District Clinical Society.

[1] Rothwell v. Caverswall Stone Co. Ltd., 1944, 2 All E.R. 308.

clinic in the U.S.A. It was closed by the police in ten days, and Margaret Sanger and her associates went to prison, where they hunger-struck and appealed, and won a small momentous decision: that if she had been a doctor it would have been all right to give advice on contraception to married people for the cure and prevention of disease. This was the first crack in Comstockery, and it widened fast to let in daylight. The clinic was opened again under the charge of Dr. Hannah Stone, who remained there till her recent death. There are now some 600 clinics in the United States, several hospitals are legally able to give contraceptive courses if they wish, and the whole attitude to the subject has become more rational.

Those who listened to this indomitable and charming speaker recounting her campaigns found it easy to recognise the qualities that have brought her victoriously through them.

A NEW DISEASE?

From Australia comes the report of a new mycobacterial infection in man.[1] During the last few years 6 patients have been seen in rural districts of Victoria with an indolent ulcer of the extremities suggesting tuberculous infection. Microscopic examination showed very numerous acid-fast bacilli, which could not at first be recovered on culture and which were not pathogenic to the guinea-pig. Indeed their appearance was reminiscent of *Mycobacterium leprae*, but the clinical picture was unlike that of leprosy. This diagnosis was definitely excluded, first by injecting into the rat infected material, which gave rise to ascites and superficial lesions of the legs and scrotum, and secondly by successful cultivation of the organism, at 33°C, on several media suitable for *Mycobacterium tuberculosis*. The epidemiological picture is far from clear. Although 4 of the patients came from a single rural neighbourhood and the other 2 from a second, no common factor of contact or association could be found; and no disease which could be connected with their's was detected among animals in these areas. Search for previous accounts of any similar disorder brought to light only a remark that in one part of Queensland several patients had been seen with a single small ulcer containing "organisms indistinguishable from *Myc. leprae*." The present report certainly seems to justify the authors' claim that this disease has not hitherto been recorded. Apart from poisoning by one of the new agents in industry, a new disease is most likely to be due to an organism which either has newly learnt the art of preying on man, or else is so rare or has so remote a habitat that it has previously escaped detection.

GLYCOSURIA IN PREGNANCY

That glycosuria is found more often in the pregnant than in the non-pregnant woman has long been known; but the mechanism and the frequency of this phenomenon are still uncertain. Using Fehling's test, Weiden [2] found sugar in 6·9% of 172 specimens from non-pregnant women, compared with 29·6% of 340 specimens from women in the first trimester of pregnancy, 19·8% of 51 specimens in the second trimester, and 21·4% of 145 specimens in the third trimester. Of a small series of 39 women in whom the urine was tested throughout pregnancy, 9 had glycosuria which disappeared towards full term. The effect of the ingestion of 50 g. of glucose upon the incidence of glycosuria was investigated in 102 patients, of whom 11% had glycosuria in the fasting specimen during early pregnancy, and 15% had glycosuria in the later months. After ingestion of glucose, glycosuria was found in over 60% of the entire group. The fasting blood-sugar of 103 pregnant women ranged from 40 to 120 mg. per 100 ml.; but in 38% of these the level was 80 mg. per 100 ml. or lower. Of 24 women who were re-examined after the end of pre 19 had a fasting blood-sugar of 90 mg. per 100 ml.

Glucose-tolerance tests were done on 102 In almost half of the 38 without glycosuria, the figure during pregnancy did not exceed 140 mg. 100 ml., and in almost every case the curve had to normal a year after the end of pregnancy. The threshold was lowered in 33; and 19 had curves as "renal glycosuria with superimposed diabetes" the blood-sugar did not return to normal within hours, yet the maximum figure never exceeded 180 per 100 ml. Post-partum curves in these patients of the same type. In 7, curves resembling the lag-curve, with peak figures exceeding 180 mg. 100 ml., were obtained.

The striking feature of these observations is frequency of lowered glucose tolerance, even in without glycosuria. Laferty [3] has suggested four that may be responsible for the phenomenon: (1) withdrawal of glucose from the maternal blood nourish the fœtus; (2) excessive consumption of by the mother; (3) excessive withdrawal of from the maternal blood through over-produc insulin; and (4) insufficient supply of glucose faulty alimentation. Of the many other theories have been advanced, two are controverted Melbourne findings: one is that this due to excessive mobilisation of glucose, and th that a raised blood-sugar plays an importan These findings imply that restriction of intake during pregnancy is fraught with the acidosis. They do not invalidate the sound rule glucose-tolerance test should be performed on pregnant woman with glycosuria.

BIRTHDAY GREETING

To mark his 80th birthday, Sir John Parso presented with his portrait at a reception held honour at the Royal College of Surgeons, Inn Fields, on Sept. 3. The portrait, which was by Mr. John Gilroy, was the gift of the Fa Ophthalmology and of the Ophthalmological of the United Kingdom.

It is given to few men to excel in all the b of their specialty as Sir John Parsons has don advice has been sought by patients all over the and his views on scientific problems are acc physicists and physiologists alike. His work on vision is still perhaps the best unbiased account conflicting theories of other workers, and for his on the theory of perception and of illumination elected president of the Society of Illuminating and admitted to the fellowship of the Royal —a rare distinction for a practising clinician represented British ophthalmology to other and the Medical Research Council regarded him of their most valuable members. Indeed he in the council in ophthalmic research and has seen that that interest was maintained up to the present Now his dreams are coming true—two of them recently in the shape of an Ophthalmic Institut the establishment of the F.R.C.S. in ophthalm His colleagues, who are still his students, are have his encouraging smile to cheer them on, the profession join in their wish of "Many more birthdays."

The Index and title-page to Vol. I, 1948, which completed with The Lancet of June 26, is preparation. A copy will be sent gratis to subs on receipt of a postcard addressed to the Manag The Lancet, 7, Adam Street, Adelphi, W.C.2. scribers who have not already indicated their de receive indexes regularly as published should do so ned a fracture of the terminal phalanx of his ring finger ruising of his thumb leading to osteo-arthritis.

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[1] MacCallum, P., Tolhurst, J. C., Buckle, G., Sissons, H. A. *J. Path. Bact.* 1948, 60, 93.

[2] Weiden, S. *Med. J. Aust.* 1948, 1, 646.

[3] Laferty, J. M. *Amer. J. Obstet. Gynec.* 1931, 22, 63

the county-court arbitration three years later it was ed there was now a subluxation of the carpometacarpal of the thumb. An expert witness for the workman evidence to this effect and produced radiograms of both to support it. In addition he stated that the radiologist ositioned the hand specially to show the subluxation ad reported its presence, and a radiogram of the other b had been taken for comparison.

en I had previously examined the thumb I had not found ubluxation, and I examined it again in court with the negative result. Inspection of the films produced made ar that the film of the left thumb did not show any subion. Moreover it was impossible to make any exact arison with that of the right thumb, since it was not in ilar position, as could be seen by the way the shadow of ight thumb was superimposed on that of the index, eas that on the left side was not. I pointed out that the logist was well known to me, and I was sure he would ave given any opinion about a subluxation on those and I refused to accept the statement without seeing eport. The report was not produced. Nevertheless the man was awarded a small weekly payment for partial acity.

e radiologist's report turned up later. It merely stated there was slight osteo-arthritic changes in the metacarpo-ungeal joints of *both* thumbs. There was no mention of arpometacarpal joint or of any subluxation.

ese examples emphasise the necessity for a long and experience of all varieties of injury, particularly in which there is no question of compensation. For y years I kept records exemplifying all types of lation and deformity. It was a never-ending source terest to see the wonderful adaptability displayed. of the most amazing was a plumber whose hands apparently totally crippled by gout. Both hands almost completely clenched owing to contractures the fingers and both thumbs; he could just separate tips of his fingers from the palm for about $^1/_2$ in.; yet I saw him "wipe" a joint on a leaden water as well as any plumber could.

ny such patients would obtain substantial comation or heavy damages if there were any question jury. Sadder to relate, it is unlikely that they d be any longer usefully employed.

ASSESSMENT OF DISABILITY

bles have been drawn up giving the percentage ility for various amputations of the limbs, from a r to the whole limb. In practice these methods seless. For instance, loss of a finger would be very us to a violinist or a pianist, but comparatively al to a porter or a dock labourer. Each case should ealt with on its merits and with regard to the type ork involved or possible. Here again a fairly wide aintance with different pursuits, crafts, and labour tremely valuable.

here is also an unfortunate tendency to classify any ticular injury in terms of its most serious or comted manifestation and to ignore the simpler types. tures of the os calcis are notorious in this respect: e that are comminuted and involve the subastrad joint with subsequent arthritis live up to their reputation and cause serious permanent disablement; eas simple breaks through the posterior part of the which do not involve joints cause little if any bility.

se 6.—An R.A.F. pilot on a visit to a lady friend found nvenient to leave by the window to avoid embarrassing lady's husband. This involved a drop ot about 20 and caused fracture of the os calcis on both sides. rtheless he was fit for duty three weeks later.

actures of the spine also vary enormously in the real bility they cause. Most cases, even of crush fractures e vertebræ, may cause little incapacity once they onsolidated, whereas the comparatively trivial fractures of the lumbar transverse processes often draw compensation for two or three years.

MEDICAL REFEREES

It might be thought that the appointment of medical referees would have avoided many of the difficulties I have described. Unfortunately this is not so, and the explanation is simple. First, no one man is sufficiently experienced or qualified to act in all cases; this could be got over by appointing specialists in each branch as required. Secondly, the remuneration is wholly inadequate, compared with the likely earnings of an experienced man (and it is obviously no use appointing anyone who is inexperienced). For these reasons we find a general practitioner or a physician acting as umpire in surgical cases in which their teachers often appear as experts. No wonder many eminent physicians or surgeons refuse to touch compensation work, whereby they might be made to appear ridiculous.

MALINGERING

When the claimant is malingering, a particular movement of a joint, ability to bear weight, &c., may be observed only once in the consulting-room, after which the claimant is on his guard, and in court it may not be possible to demonstrate it again. Alternatively, if it is successfully demonstrated, the judge, counsel, &c., often miss the point from lack of medical knowledge.

A malingerer seldom gives himself away so completely as in the classical case in which the counsel for the employer, during a gruelling cross-examination, suddenly asked: "You say you have been unable to raise your arm at all since the accident—well, how high could you get it before?" Without thinking, the man instantly put his arm freely above his head.

APPRECIATION OF MEDICAL EVIDENCE

Anyone with a sense of history must look with some envy on the medieval mummery lingering in the courts and think how wonderful it would have been to see a surgeon performing a gastrectomy in a full-bottomed wig. But why after having administered the oath with all the solemnity of bell, book, and candle, do they

> "Assume that the witnesses summoned in force
> In Exchequer, Queen's Bench, Common Pleas, or
> Divorce,
> Have perjured themselves as a matter of course"?

The plain fact is that medical evidence is appreciated only with great difficulty, if at all, by lay tribunals. In these cases the doctor is in a false position; after years of training in scientific methods his clinical observations and opinions are judged by men whose whole outlook has been classical and academic and who, like the schoolmen of the Middle Ages, are more conversant with books than with nature. For instance, I have heard eminent counsel argue that, since the practitioner had examined a patient many times, he must know more about his injury than the expert who had examined him only once. And even a county-court judge once claimed that two general practitioners and a house-surgeon were a good working majority against an experienced surgeon in a complicated surgical case.

CONCLUSIONS

Cases of injury involving compensation are essentially difficult and should receive specialist attention from the beginning and during rehabilitation.

It is unfair to expect general practitioners to treat or assess disability in these cases.

The suggestion in the new Act to remove these cases from the courts is strongly supported by medical experience in the past and, so far as assessing disability is concerned, should include common-law cases also.

based on inaccurate diagnoses from various causes but chiefly from lack of special experience in these cases. They can scarcely be blamed therefore if they take up weak or even mistaken cases at times. There is unfortunately another side to it, and when it is remembered that it costs at least £20–30 to defend a county-court action, it is not surprising that in about 98% of cases the employer submits to the workman's claim being settled without a judicial decision. As Collie asks, "Is it unreasonable to suggest that a large proportion of the cases in the 98% are settled by processes which might be described by an ugly word?" Colour is lent to this view by the obvious preparation some workmen have undergone before they come for a medical examination. In fact their solicitors have such a poor opinion of their case that they have been told not to answer any questions at all for fear they should give themselves away.

WHEN DOCTORS DISAGREE

It has become a byword that doctors agree to differ, and it must often appear to the legal mind, untrained in medicine, that opposing medical experts were disagreeing about simple facts without any apparent justification. As Kitchin says, "One of the saddest sights in the administration of justice is two processions of medical witnesses, one on each side, in a personal-injury case or a murder trial where the prisoner has pleaded insanity, flatly contradicting one another on fundamental matters of fact." [2]

In these cases, however, there is plenty of room for wide differences of opinion, even when the opposing witnesses are evenly matched in training and experience. When, as so often happens, one of the witnesses, either so-called expert or general practitioner, is expressing opinions on subjects of which he cannot, from lack of training or opportunity, have any adequate knowledge, it is not surprising that agreement cannot be reached.

Case 3.—A man, aged 31, stated that in February, as he was passing a stationary lorry on his pedal cycle, the driver of the lorry opened the offside door and knocked him off his bicycle, and he sustained a sprain of his left wrist, bruising of his left hip and knee, and a sprain of his left ankle. He was able, however, to pick himself up and, after talking to the driver, rode his cycle home. He consulted his panel doctor, who treated him, but he was not referred to any hospital. In March, exactly a month after the accident, he was referred to me complaining that he had no grip in his left hand, his left hip was sore, and his left knee very painful. The ankle was better, though it had been swollen.

His general condition was fair, though he was poorly nourished; and there was no sign of any traumatic neurasthenia. He had a bandage round his left wrist, but the joint was normal in all respects, and there was no limitation of movement of wrist or hand. All bruising about the left hip had disappeared, and movements in all directions were free and painless. There was a bandage round his left knee, but the joint was cool to touch, there was no swelling or effusion, all movements were free and painless, and there was no wasting of the thigh muscles. The left ankle was normal, and he bore weight well on the limb, though at first he pretended he could not do so.

I reported that he was malingering; from the history of the accident he could not have hurt himself much; otherwise he could not have ridden home. Moreover his demeanour was unsatisfactory, and he was very guarded in his answers to questions and appeared to be lying most of the time. Even when I asked him if his bicycle had been damaged, he had to think for quite a time before he said it was not.

In September his solicitors wrote to say the case was down for hearing at the forthcoming assizes. They enclosed a report from the medical officer of a county hospital to the effect that the patient had been admitted in mid-August with a history of frequency of micturition, hæmaturia, and pain in the lower abdomen dating from May (three months earlier). Radiography suggested renal tuberculosis, and this was confirmed by finding the bacillus in the urine. In the opinion of the medical officer there was no evidence of any disease or disability following the accident and no connexion b it and the tuberculosis of the kidneys.

At the trial in October two general practitioners a medical officer of a sanatorium, to which the patient the meantime been admitted, gave evidence to the that the shock of the accident had caused an anxiety which had lowered his resistance to tuberculosis, whi been latent before the accident. Against this purel jectural assumption the following facts were (1) From the history of the accident there was no of any serious injury or shock; (2) when the patie carefully examined exactly four weeks later, there sign of any injury, no abnormal mental state, and n plaint of any urinary symptoms; (3) in tuberculosis kidney urinary symptoms appear early, whereas i case they did not arise till May, 3½ months after the injury; and (4) renal tuberculosis is a blood-borne and the evidence is against trauma being an factor—in any event there was no evidence of any inj either kidney in this particular case.

The judge thought the disease was bound to co sooner or later, but he was satisfied that the accident direct cause of the anxiety neurosis, which in turn the onset of the disease, which would probably cause earlier—perhaps much earlier—than otherwise would case. The plaintiff was awarded £1568 damages.

A case of this kind is a fairly straightforward problem, and any fully trained surgeon would little difficulty in coming to a contrary opinion o facts. For a layman without that scientific train would be impossible to assess the surgical issues c expertise of the various witnesses. I therefore d complain that the workman was given the benefit doubt. I am mortified that the "doubt" should on such an old cobweb as "anxiety neurosis."

Case 4.—A workman, aged 45, was holding the of a handcart while it was being loaded. By a very heavy weight was suddenly dropped on the the shafts went up, carrying the workman with them then dropped again as the weight rolled out; he heavily on his feet. Though he complained of some p continued working for several days, limping on his leg. He then ceased work, was examined by various do and was treated at different hospitals until, about months later, he was referred to me. He then comp weakness and twitching of his right leg. Even while sitting quietly in a chair his right leg was constantly and his right heel tapping on the floor.

Examination revealed no sign of any organic lesion when his attention was distracted the clonic spasm leg ceased. I reported a functional condition; this was and before the arbitration a well-known orthopædic was asked to examine him. He did so and agreed to the hearing. The evidence on the other side was to the that the workman had an organic nerve lesion as the of the accident. This was supported by a Ministry of P neurologist, who averred in evidence that all reflexes absent in the affected limb. We denied this, and the decided that, since the medical evidence was so mu variance, he would see the man in his private room to the medical witnesses to demonstrate their findings.

The patient was laid on a wooden table, his right beating a tattoo all the time. The Ministry of Pe neurologist showed that it was impossible to demonstrat of the reflexes owing to the great spasticity and clonic in the limb. The orthopædic surgeon was faring no b when I remembered that if the patient's attention wa tracted the clonus would probably stop. I therefore w over to him, tapped him on the shoulder, and said "I th you told me the handcart was painted red when as a mat fact it was green." He was so indignant at this gross statement that he at once became involved in a sp argument, during which the limb gradually ceased twit and the orthopædic surgeon was able to demonstrat Babinski, patellar, and gluteal reflexes and to show there was full movement at all joints and no spas whatever. While the neurologist was being revived judge remarked that "Whatever the man was suffering he was satisfied it was not an organic nerve lesion."

Case 5.—A dock labourer, aged 72, was said to have ha left hand trapped between a stanchion and a skid and to r the successful building and establishment of a h centre, agreement and coöperation are needed en the health authority, the executive council, and cal doctors. Such agreement, we understand, has achieved in Birmingham. The plans originating the health authority (the Birmingham city council) been approved by both the executive council and ocal medical committee. Both these latter bodies nxious to see the centre built as soon as possible, they are willing to coöperate fully in arranging for medical staffing of the centre. *The number of doctors who have already expressed their willingness* (subject to satisfactory negotiation with the Ministry of Health as to conditions and terms of service) to work in the centre when it is built is sufficient for the city council to embark without qualms on their project as soon as the sanction of the central authorities has been secured.

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[2] Kitchin, D. H. *Med. Annu.* 1942, p. 208.

This considerable progress makes all the more regrettable the controversy which has arisen, and is still unresolved, between the sponsors of the centre and the Ministry of Health over the potential use of the health centre by private patients as well as health-service patients.

Disabilities

12. BLINDNESS

une, 1944, at the age of 30, I was totally blinded ying bomb, also receiving multiple injuries to my hest, and arms. I had been married for four years. d a baby daughter of nine months. After four s I was discharged from hospital and began g at St. Dunstan's. I left the training centre in 1945, and in the following September started ment with a large firm in the Midlands.

d not lose consciousness immediately on being hit, tried to see what had happened to the other nt of the room. I couldn't, and therefore experi- my first fear that I had lost my sight. I had my confirmed in hospital, when the surgeon told me e had removed my right eye, and that it was unlikely he other would ever be anything more than orna- l. There was a remote hope that some sight might to my one eye, but I never really counted on it, gh I secretly tried all sorts of experiments on f, such as trying to discover whether I could see ining a torch under the bedclothes. The net result hat I knew the worst very early on.

annot deny that the realisation hurt like hell at , and that I had my periods of intense depression, everything worth while seemed lost. It hurt to that I should never again see my wife or my daughter, of whom I had seen so little during the years. Looking back, two principal things helped fight off, and avoid showing, this depression—the ling courage of my wife, who from the first showed I should not have to carry my burden alone, and wn determination not to be a burden to others.

wife was at my bedside when I recovered conscious- n hospital the morning after I was hit. Her readiness ce the future cheerfully was an immense help in mining *my own reactions to my changed circum-* ces. We weighed up our assets and decided that we d still make a success of life. We agreed to present erful face to the world and help each other in doing so. timulated by the cheerful banter of a fellow officer in next bed, I soon started to do things for myself. I d I could light a cigarette by sliding my thumb g and feeling for the end with a lighted match, gh I had an unreasonable fear that I would burn face or damage my bandaged eyes. I signed all the rs written for me by my friend. With a tremendous t I wrote a letter in longhand to my wife. I began orm habits to make *life easier—to put round things* n where they wouldn't roll away, to remember re I had put such things as my razor and shaving soap d I also began to take a more intelligent interest in gs around me. I got people to describe the hospital the surrounding district. Thus I built up my own tal picture. I learned how necessary it was for ted people to be accurate in their descriptions; shod ones were worse than none at all.

ome things I had to learn by painful experience. A ision with the corner of the bed when I was picking a shoe taught me that it is advisable to ensure that there is nothing in the way before bending down quickly. My first solo journey on a bus at this time taught me that it is as well to make sure that no-one is occupying the seat on which one proposes to sit. I landed on the lap of a young lady, who fortunately did not take too serious a view of the incident. An embarrassing moment when I tipped the contents of my plate on to my lap brought home to me that a blind person must constantly guard against the tendency to pull the food on his plate towards him during a meal. With my sighted intimates I adopted a system by which they said "six o'clock" if I was in danger of pulling the food off the near edge of my plate. At first I used to get them to describe, as though they were describing a target, the location of food on my plate. "Six o'clock beef, nine o'clock potatoes," and so on. Later I found this unnecessary, though this mode of locating things is useful generally at table. I do, however, like to be told what food is placed in front of me. Some blind people like to have their meat cut up, but I prefer mine served in the ordinary way, even though this sometimes presents difficulties. It was some time before I appreciated that the safest way of approaching one's glass was from above with the fingers slightly extended.

In hospital, I learnt to use my ears more acutely, to use sounds to help me build up my picture of the things round me and so to establish landmarks for finding my way about. Later, when I became more competent in walking about on my own, I began to distinguish the subtleties of echoes thrown back by lamp-posts, walls, and other objects. It was a great thrill when one day I thought I detected a difference in sound indicating that there was an object on my left. I investigated with my stick, and was jubilant to find that there was, indeed, a pillar-box there. I also learnt other devices for getting round on one's own: using the camber to walk along a quiet road, the value of counting one's paces, how to tell the proximity of objects by the difference in air-pressure, *and the wisdom of taking a complete turn round a* corner before attempting to cross a road, so as not to wander into the middle of a cross-road.

I had been taken under the wing of St. Dunstan's three weeks after being hit. The attitude of my fellow St. Dunstaners was a fine stimulus. They had no sympathy for themselves, reserving their sympathy for other patients in the hospital. With them, in hospital, I learnt to type and read Braille. I experienced an awful fear that I should never develop my sense of touch. For a short time I was horrified to find that I could not distinguish the Braille formations, but the thought that *this* was the *only* way out of *illiteracy* kept me going. Soon I was happy to find that I could read again. Later, I did carpentry, learnt Braille shorthand, played the piano, went horse-riding, and took part in athletics.

One of the biggest problems has been how to adjust one's relations with sighted people. This was particularly difficult in the early stages, when I longed to do things on my own, and well-intentioned but *misguided* people would try to help me. Once I had acquired confidence in finding my way about I was glad to welcome assistance. Sighted people can be particularly helpful by guiding one in the correct way. I personally dislike being propelled

The medical tribunals should be carefully chosen from among specialists with wide experience in treating and examining these cases; though they must not, of course, assess the disability of their own patients.

If the new Act will remove workmen's compensation cases from the courts it is to be welcomed. But unless the personnel of the medical boards is very carefully selected there may be great hardship for many working men, or alternatively a third of the population may become pensioners of the remainder.

DISTRIBUTION OF STREPTOMYCIN

THE Ministry of Health announces that in future streptomycin will be allocated and distributed by regions. In each region beds in stated hospitals "will be so staffed and equipped as to ensure the necessary scientific control of the treatment. It is therefore hoped that, so far as possible, doctors having suitable patients will endeavour to admit them to these beds." The number of beds and cots allocated and the distribution centres are as follows:

Region	*No. of beds*	*Distribution centres*
Newcastle	68*	General Hospital: Mr. Wing, chief dispenser (Newcastle 35211). Royal Victoria Infirmary: dispenser (Newcastle 25131). Pathological Laboratory, Cumberland Infirmary, Carlisle (Carlisle 590).
Leeds	68	Blood Transfusion Laboratory, Bridle Path, York Road, Seacroft: Dr. T. S. Marshall (Leeds 45091).
Sheffield	74	City Hospital, Hucknall Road, Nottingham: Dr. W. Morton (Nottingham 66292).
East Anglian	38	Addenbrooke's Hospital, Cambridge: Mr. Hopkins, chief pharmacist (Cambridge 4451).
North-West Metropolitan	138	West Middlesex Hospital, Twickenham Road, Isleworth: Miss Bristowe (Hounslow 2311).
North-East Metropolitan	64	Mile End Hospital, Bancroft Road, E.1: Dr. W. G. Sears, physician-superintendent (Advance 2873).
South-East Metropolitan	67	Grove Park Hospital, S.E.12: Dr. M. H. Logg (Lee Green 1547).
South-West Metropolitan	66	South London Blood Supply Depot, Benhill Avenue, Sutton: Dr. E. G. Murphy (Vigilant 0068).
Oxford	80	Churchill Hospital: Mr. Trillwood, chief pharmacist (Oxford 48651).
South Western	56	Ham Green Hospital and Sanatorium, Bristol: Dr. J. Macrae (Bristol 31165).
Wales	57	Cardiff City Isolation Hospital: Dr. Emrys Harries (Cardiff 960).
Birmingham	90	Selly Oak Hospital: Mr. R. P. S. Kelman, medical superintendent (Selly Oak 1361).
Manchester	60	Royal Infirmary: Mr. J. B. Lloyd, chief pharmacist (Ardwick 3300).
Liverpool	50	Fazakerley Sanatorium: Dr. O. F. Thomas, medical superintendent (Aintree 2324).

* Incomplete return.

The Ministry suggests that the greatest potential danger is the production of streptomycin-resistant strains of *Mycobacterium tuberculosis*. "Thus a patient with very early pulmonary disease who might have responded to other recognised forms of treatment alone but who is given streptomycin 'prematurely' may be found, in the event of relapse or extension of the disease, to be beyond the reach of streptomycin treatment. From the public-health point of view there is clearly a risk of old chronic cases spreading infection with streptomycin-resistant strains, so that patients acquiring meningeal or miliary tuberculosis from them cannot hope, in their turn, to be benefited by streptomycin treatment."

THE BIRMINGHAM HEALTH CENTRE

MOST local health authorities, their housing still unsolved, have been only too ready to set aside provision of health centres as at present im Where an adequate service (though it may not coördinated one) is already provided from surgeries and municipal clinics, building and difficulties preclude any ambitious schemes for improvement of medical facilities. But where are inadequately served, or are outgrowing their services, new arrangements have somehow to be either by communal planning or haphazardly (as in past) by allowing doctors migrating to the find or build *accommodation for themselves*. T our most influential public authorities, in Lond in Birmingham, both concerned with the provi new housing estates, have decided to make the centre the key to the medical services for their communities. The London County Council has a the building of a health centre on its new Woodberry Down, Stoke Newington, and the city council has sanctioned a centre at Stechford

In some ways the Birmingham project has the immediate interest, for it has been planned f struction as a single-story building built from st prefabricated units. Materials are available *building and little skilled* labour is required erection. It should then be possible for it to b and brought into commission with little delay provide a valuable testing ground for group practice. If, too, the prefabricated buildings satisfactory, the plans and layout of the Bi experimental centre may well be copied with tions wherever a suitable site of sufficient size is Single-story buildings admittedly demand sites in urban areas seem of wasteful size, but in years t when more permanent buildings come to be may well be grateful not to have to fit them into veniently cramped sites. It is to be hoped, that when the Birmingham centre is built it will many municipal inquirers and not a few imitators

The centre will serve some 20,000 people. The site, of about two acres, is easily accessible by bu cars. The centre will be built of Orlit prefabricate around three sides of a square enclosing a fore on the fourth side. It will be finished externally in roughcast, and internally in flat oil paint in pastel Decorative schemes in the general-practitioners' vary, and consideration will be given to the doctors' taste and requirements. These suites, six in numb (with a minor-operation room, a recovery-room, room, office, records-room, dispensary, and lab occupy one wing of the centre. Each suite will a consulting-room, an examination-room, and a waiting The central block will house clinics for *maternity* and welfare services and will include a lecture-hall, a to nursery and playground, accommodation for sunlight ment, and a pram-park. The remaining wing has a clinic, accommodating two dental surgeons, a caretaker and the common-rooms for the staff of the centre. consist of a doctors' common-room, a medical library, common-room, staff dining-room and kitchen, and comprising a bed-sitting room and bathroom for *the* on duty.

Architect's drawings of the proposed centre appeared in the Birmingham press, and a detailed was published in the *Medical Officer* for Aug. 14 (p From these it can be seen that the design, whi the work of Mr. Donald A. Goldfinch, architect t city of Birmingham health committee, is both tionally sound and architecturally attractive. It plan, too, which if successful in Birmingham easily be changed—by alteration in grouping or int division of its component units—to suit larger or communities or other sites.

erpreted by a fellow outpatient as "Double Tuber-ous Consumption of the Ankle" (though it only meant o come again in two days").

lost abbreviations are unnecessary: thus, if a patient's ier is well it takes ten letters to write "father well" eleven letters and two stops to write "father a. and yet every student prefers the latter form. (Surely if body is well we can take it they are alive.) Probably vorst offenders are chest experts, with their P.P.'s, , and P.C.'s, expressions which they use in speech vell as when writing. Ophthalmic surgeons are y bad too, and I remember one who wrote his ons on my cases almost entirely in single letters e alphabet. I cured him by sending him a request .T.M.I.T.P.N.G. (Please will you tell me if this nt needs glasses).

ere is one kind of abbreviation which I think be used a lot more. I mean the word made of ls, so much used in the war (PLUTO=Pipe lines r the ocean and FIDO=Fog, intensive dispersal of). nedicine we have only two of this kind—EUSOL ding for Edinburgh University Solution, and BIPP Bismuth, Iodoform, and Paraffin Paste. May I est (neurologists please note) getting rid of dysdiado-hesia and having DITHER (Difficulty In Twisting ds Equally Rapidly).

* * *

*rading Professor Kinsey's survey of Sexual Behavior in the Human Male.**

pid! Cast away your bow and quiver—
Statistics prove your method inexact.
onne! Go take a jump into the river:
You hymned the essence, but ignored the fact.

ed in some cool aseptic heaven above,
Trained statisticians painlessly inquire
the quaint geometry of love,
The quantitative aspects of desire;
ve the conduct of the lovesick male
(Not passionate, not noble, not obscene),
plot it on a logarithmic scale,
Noting a random scatter round the mean.

onumental volume, smug and fat!
Did Man, who wrote the Song of Songs, write that?
d! O Kinsey! O Jehoshaphat.

* * *

ase sir, I want to patent a smile. You know that Parkinson, who patented the mask? Well, in the conditions in which you get that bland or some- almost brutal lack of expression you get a most us smile. It's like the sun breaking through der clouds, or ham and eggs when the dish-cover is ved, or better still like a child's face watching a . Scientists would probably describe it as having ty geniality content or a high coefficient of friend-. I want it called a Percy Peripat's smile. Perhaps day people will say of a book or a play, "It's a ct Percy Peripat——."

or Parkinson, but perhaps he was modest like eus, who had only a weed named after him when ight have had something grand like an orchid or ble like an oxlip.

* * *

rs. J induced abortion on herself and because of nued bleeding a D and C was done and two further ses removed. When she was informed later that had had triplets her comment was: "But doctor at case you should have left the other two because had twins I would be a top priority for a prefab." e is a great deal in this Social Medicine that we ors do not appreciate.

* * *

a conference the surgeon replied to a physician's : "I am sure Dr. X knows as well as I do how to these cases—one should abandon the A.P. and buy streptomycin in the black market." At this rence, also, I was encouraged to hear a tuberculosis nistrator say that the trouble is that we have a of inflation, with too much paper chasing too few

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ore jumping to conclusions from these lines, students of sexual haviour should see our review of this book (*Lancet*, 1948, 795) or, better still, the book itself.—ED. L.

Letters to the Editor

STUDENT SELECTION

SIR,—The rush to join the medical profession has created for the psychologists a problem which on their own admission will keep them pleasantly occupied for many years to come, and which will no doubt provide jobs at the public expense for many recruits to their ranks. This new research will, it can be confidently predicted, go the way of all other research, spreading in endless ramifications and never reaching finality. Already there is adumbrated the first extension—research into the selection of people suitable for the selection of people suitable for the pursuit of medicine. And so it will go on and on. The possibility of raising the percentage of "outstanding" students from 10 to 39, envisaged by Mrs. Petrie (Aug. 28), illustrates the lack of logic which characterises many of the emanations from our laboratories. For when 39% are outstanding against 61%, it will be our proud boast that never were so many outstanding against so few. The problem will be solved, not by the tests, matrices, and screenings of the psychologists, but by the study and correction, by minds untrammelled by the jargon of modern science, of the motives behind the abnormal desire for entry. The chief of these motives are four: snobbishness, the lowering of financial barriers, the call of idealism, and the search for economic security.

In regard to the first and second, the easier the climb, the greater the number of climbers; we can only hope that the creation of new hills will ease the congestion on our own. To the idealism of adolescence medicine presents an appeal which is lacking in all other vocations except the Church. The doctor is noble and self-sacrificing, a beacon of virtue in this sinful world. In contrast, the business man is selfish and avaricious, flourishing on the exploitation of his fellow men. A young man just down from Oxford told me with great joy that he had obtained a post in hospital administration. "There," he said, "I shall be doing good in the world. If I had gone into industry I should only have been making money selfishly. I could never have stood it." His attitude shocked me, for I thought his university would have taught him better. It is, however, a view which is widely held. The inevitability of the association of trade with social injustice is a doctrine which dies hard, being perpetually fanned into flame by many of our sociologists, who keep harping on the evils of the industrial revolution. The headmaster of one of our leading public schools tells me that there are twice as many boys leaving to take up medicine as there are doctors' sons. Many of them embrace medicine scorning the family businesses where they are sorely needed.

To many parents financial security is a prime inducement. After all, the sick will always be with us whatever happens. These people do not realise that prosperity in medicine depends entirely on the prosperity of our export trade. There can be no security in medicine unless that trade is secure. We ought to view with grave concern the prospect of the most intelligent of our youth being encouraged to shun commerce as something unsafe and unclean, and to seek financial security and moral salvation in a profession completely dependent on commerce. We may question whether the attempt to cream off the ablest into medicine is in the highest national interest.

We must learn to see medicine and the community in their proper perspective. We must realise that, intelligence being limited in quantity, medicine cannot be enriched without the impoverishment of other vocations where it is needed just as much. We must educate youth and parents in a saner, more realistic, and less sentimental outlook. The headmaster mentioned above, seeing the danger with a prescience unfortunately lacking in the leaders of our profession, has shown the way. He has instituted lectures by men prominent in agriculture and industry with the object of teaching boys that in those fields there are opportunities for the cultivation of moral and intellectual qualities as great as or even greater than those existing in medicine.

by the shoulders. I prefer to take the arm of the person guiding, so that I am slightly behind him; this makes it easier to avoid obstacles and to be ready for steps up or down. When being shown a chair I like to have my hand placed on its back. In conversation I deprecate the avoidance of words such as "see" and "look."

Apparatus which has been invaluable to me in my job has been a typewriter, Braille shorthand machine, pocket Braille frame for making memo notes, a Braille writing machine, a stock of thin cards about 5 inches by 2 inches, Braille watch, and, of course, my walking-stick. The cards are used for making Braille notes on the pocket frame or for making longhand notes with a pen or pencil. I use a ball-pointed pen so that there is no need to discover which way round to hold it.

Some blind people do not try to keep up their longhand writing. This seems to me a pity. I have managed to continue to write as automatically as I did when I was sighted, and I have found this, and similar operations such as playing a piece of music which one has memorised, fairly easy if one does not consciously think about the operation.

Performing actions naturally, as one did when sighted, is an aim that I have tried to follow in as many directions as possible. Thus, unless there is need for special care, I prefer to walk along using my walking-stick as a sighted person would, swinging it to the right or left if necessary to maintain contact with a wall or grass verge.

* * *

It may seem that I have minimised the difficulties. These have, of course, been perpetual, and some phases have been harder than others. Periods of insomnia have coincided with periods when I was making the greatest effort. At times I have felt the need to relax and be content to sit and do nothing.

My work and my family have not given me much leisure time. The leisure activities of blind people can be legion, so I will mention only the more unusual forms I have sampled. These include high diving, surf-riding on the Cornish coast, aquaplaning, and attempts at playing billiards, snooker, and table-tennis. The last three were failures, but the attempts were amusing.

One of the compensations of blindness is finding ways of overcoming it. Using a dial telephone was at first a laborious process, until I found that all four fingers of the right hand could be employed to facilitate the operation. An aluminium frame, with appropriate spaces, enables me to make out my own cheques. The difficulty of distinguishing between a ten shilling and a pound note was overcome when I found that one could measure the width of the note unobtrusively by passing it between the first and second fingers.

It was some time before I plucked up courage to help my wife with the children—now a girl of 5 years and a boy of 20 months. One has to maintain a hundred per cent. concentration and one must be sure of one's terrain. It is advisable to take some special precautions—to approach a child with one's fingers curled, to back through a doorway when carrying a child, to hold on to the bannisters firmly with one hand when carrying the infant downstairs—but the result is a tremendous gain to any blind man who is fond of children. Ingenuity is needed to devise ways of playing with children, and one has to be constantly on the alert, but the blind man can tell stories with the rest, he can make models in wood or cardboard using his sense of touch to guide him, and many other things besides.

To summarise, I would say that the first essential is to accept cheerfully your changed position. Milton was a striking lesson in this, and many would find his "Sonnet on my Blindness" as helpful as I did. The next thing is to regard yourself as a normal person with extra difficulties and persuade others to accept you as such. The rest is patience, perseverance, and a sense of humour.

In England Now

A Running Commentary by Peripatetic Co

THE boarding-house abutted on a triangle of and it was when I chanced to look out of the b window towards the edge of this that I saw the p His handcart was abandoned by the roadside, and he but his upper end which I could not see for grass nettles, was twitching violently. His boots were de ing circles in opposite directions. Now and then the phase would succeed the clonic.

It is all very jolly to rush out and administer —all very jolly, that is, if you qualified last week other things weigh in the mind against a Hippo rush to stick one's neck out—inquests two hundred from one's home town, persistent beggars complete hysterical fit, epileptics who prefer to be left to peace or who become pugilistic on recovering ness. But I had signed the visitor's book rather and everyone looked at me. "There's a man hav *fit*," they muttered in my direction. I went out.

The patient was lying full length in the grass *his head and shoulders down a manhole, struggling* tap. He met my gaze with an even stonier one, remarked that someone had fixed down this mate with a sanguinary monkey wrench. Anyhow, differential diagnosis on the way out had done me

* * *

My son, who is half way through his hospital his medical school, says in his last letter:

> "I didn't know that I had given you the that I was getting slack about work. The truth is have been completely 'had' about what our teachers are supposed to do. I had expected that would tell us what to learn and how to use our kn when it was learnt. Instead, each of them presents us *a single piece of a jig-saw puzzle, and leaves* it to build up the puzzle. It is just too bad if they give than half the pieces, and some of them badly cut.
>
> "I have now reached the same place that all seem to get to at about the same time. We realise no-one is going to give us a *comprehensive* picture subject and that the only thing to do is to plunge books, find the missing pieces, and then try to put together, still not knowing what the puzzle will when completed. It is a shocking waste of time, and money."

The fact is that medicine is one and indivisible. ophthalmologist may have the first clue to disease, the dermatologist to thyroid trouble, symptom of enuresis in a child may disclose a It seems to me foolish to stuff students with a of chemistry, physic, biology, anatomy, and ph and then consider that he is scientifically equipp deal with medicine.

* * *

Our radiologist is normally a cheerful fellow luncheon, but today he was prodding his fried *a moody sort of way and muttering* various letters alphabet to himself. We tried to cheer him up, b he would say was F.H.N.H. ? I.U.D. At first we tho it was some sort of spell to make him see better in the but at last we got out of him that he was suffering acute abbreviophobia, and that he had found the let written on an X-ray request form that morning. had no idea what part of the body to X ray. We t to be helpful: "Fractured Hand Now *Hurting* Unciform Decalcified" seemed ingenious but unlik "Four Horrible Nasal Hæmorrhages ? Investi Underlying Disease" suggested that a film of the n pharyngeal tract should be taken. Eventually, beca the request had come from a maternity ward, it referred to an obstetrician, who decoded it prompt "Fœtal Heart Not Heard. ? Intra-Uterine Death"

I think the radiologist was right to be annoyed. amount of irritation or confusion abbreviations caus greater than the time they save. They can be danger too. I have seen a nurse reading "guttæ H & C" preparing to put alternately hot and cold drops into eye. I have seen a patient with a sprained ankle on wh card was inscribed T.C.A. (2) having this comfortin om from the higher age-group, because they could more reliable answers to questions. In no case was a recurrence, and only 4 children showed any signs e location of the warts: these were in the form all localised callosities. Indeed most of the children orgotten the site of the warts, and several did not which foot. Advantage was taken at this examination of noting any associated foot abnormality. Slight lanus was found in 2 cases, and a moderate degree llux valgus in 6, but the position of the warts in cases could not be associated with the deformities. these children 36 used the swimming-baths all the round, and 15 in summer only; 39 used shower- regularly after physical training. Only 2 had communal gym.-shoes.

the many hundred cases treated before at the linic none have had to be referred for more energetic ures.

thout precise knowledge of the ætiology of plantar , preventive measures are mainly directed towards ding established cases from places which favour pread of this disease—i.e., swimming-baths and ers. The feet of children using such places should equently examined. It is doubtful whether the of disinfectants for the surrounds of baths and ers is of any value. In many affected children a ury stimulus, probably an abrasion, may have been iced by nails jutting into the shoe or by ill-fitting . It is therefore important that shoes should be rly fitted and comfortable.

e experience shows that (1) conservative treatment nently suitable for plantar warts and is the method oice for school-children; (2) chiropodists are com- t to deal with this condition, thus doing away the need for surgery under anæsthesia which s medical man-power; (3) other forms of treatment e the patient to risk of scarring and ulceration on re points; (4) little or no discomfort and very limitation of activities result from conservative nent: and (5) the expenditure of time and money ares very favourably with that in other forms of nent.

n indebted to Dr. A. T. W. Powell, M.O.H., Waltham- for his permission to publish these facts.

MELVILLE WATKINS
thamstow. Deputy Medical Officer of Health.

SHOULDER-GIRDLE SYNDROME

—In their article on June 26 Dr. Parsonage and ldren Turner did not mention syphilitic amyotrophy eir differential diagnosis. In view of this the ing case may be of interest.

miner, aged 47, reported to the medical outpatients' tment on July 27 with a history of being perfectly well 10 days previously when he was suddenly seized by a pain in the right shoulder, while sitting at home. The increased, reaching its maximum intensity in 48 hours making sleep impossible. It then spread to the neck uter border of the upper arm as far as the elbow; it lightly aggravated by movements of the shoulder, but by supporting the arm in a sling. Then, 4 days after nset of pain, he noticed some weakness of the arm which ally increased during the next week. There was no t history of trauma, malaise, headache, visual upset, or thesiæ.

amination showed slight wasting of the right deltoid marked weakness of abduction, although all movements shoulder were restricted owing to the severe pain. The and radial reflexes on that side were diminished, but iceps reflex was brisk. Sensation was unimpaired and her abnormalities were found in the central nervous n. The heart was moderately enlarged, and there was tolic murmur in the aortic area; X-ray examination chest showed generalised cardiac enlargement with tion of the aorta. Blood Wassermann reaction (W.R.) egative.

patient was admitted to hospital on Aug. 16. The ng of the right deltoid had increased and the right spinatus and infraspinatus were also involved; the however, was reduced to a dull ache and sensation ned normal. Blood W.R. was still negative; but the rospinal fluid contained 50 mg. protein per 100 ml., and 30 cells per 100 c.mm., and the W.R. was strongly positive.

This patient's symptoms and signs closely resemble those of the shoulder-girdle syndrome, and had not the condition of the heart directed our attention to a possible syphilitic ætiology the patient might not have been admitted for lumbar puncture; and thus the correct diagnosis would not have been reached.

CHALMERS H. DAVIDSON
Royal Infirmary, Edinburgh. NEIL S. GORDON.

CONTRACEPTION IN GERMANY

SIR,—At the Cheltenham Congress on Population and World Resources Dr. Durand-Wever's remarks about contraceptive clinics in Berlin referred only to the Russian Zone. Both from the platform and in private conversation she complained how odd it was that, in the British and American zones, not only were contraceptives forbidden but the passage of appliances and literature through the post was effectively stopped by the Control authorities; and that Allied governments were still continuing the repressive measures against contraception first begun by Hitler. This position is directly related to the figures given, of one abortion for every live birth. It would be unfortunate if your readers were to assume that in this terribly urgent problem freedom to limit the family existed in the British and American zones, where in fact such freedom is most effectively denied.

As one Dutch delegate put it, speaking of the time when, under the Germans, contraception was forbidden in Holland: "They made us contraceptually impotent." It seems a tragedy that in an area containing 65% women, according to Dr. Durand-Wever, and where the need is so urgent, the British authorities should continue the legislation initiated by Hitler.

Urmston, Lancs. B. SANDLER.

FAMILY PERIODIC PARALYSIS

SIR,—In 1901 Sir Farquhar Buzzard[1] gave in your columns an account of this rare disease in two young brothers and their mother. As the younger of the two brothers in this report I should like to describe an accidentally discovered means of alleviating the condition.

The attacks may be divided into two kinds: (1) ordinary, and (2) continuing.

Ordinary attacks are the more frequent, with sometimes as many as four in a day. Two of these would probably be local and very slight, not much more than a feeling. These attacks do not come on during muscular contraction, though the arms may be affected while one is walking. The immediate cause of an attack appears to be anything that lowers the vitality—for instance, exercise, hunger, cold, or diarrhœa. A slight attack may occur locally after the use of certain muscles, perhaps in a hand or arm, or in both hands or arms. A bad attack will affect all the muscles of the body, and a very bad one also affects severely the internal organs. The heart seems to flutter, the eyelids have a tendency to close, the back of the tongue seems to swell (I do not think that it really does), and swallowing and speech become difficult. Sight, hearing, and consciousness are not affected, but the whole of the body is helpless. Such an attack may last for an hour or more. After it is over there is a feeling of great rest and refreshment, and all tiredness felt before the attack came on has gone. Attacks are accompanied by an unpleasant but not painful sensation that I cannot describe; there seems to be a soft grip about it. Occasionally an attack comes on with practically no sensation, or a very slight attack may be accompanied by a lot of feeling. The likelihood of an attack gets less as the day advances, but one may occur in the night during sleep.

Continuing attacks sometimes follow ordinary attacks and are much the more tiring of the two. They may last for some days and are accompanied by a "beaten" feeling in the parts affected. They occur generally in the legs below the knees, either in the muscles in front of both legs or in those at the back of both. In either case walking is very difficult and exhausting.

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[1] Buzzard, F. E. *Lancet*, 1901, ii, 1564.

We shall solve the problem only if we discard the narrow professional for the broad national point of view, bearing constantly in mind that our future prosperity depends on the attainment of a balanced society.

Cambridge. FE. ROBERTS.

SIR,—Your extract[1] from the paper by Dr. Fraser Roberts and Dr. Eliot Slater is wisely chosen. As a signature tune to the main subject of your educational number for 1948, might it not be rewritten thus:

> "Few would deny the advantage of a well-stored brain, a high power to correlate clinical observations with interrogation and laboratory reports, and to devise further investigations, an impressive manner, clear speech, and a good enunciation. Such qualities entitle their owner to submit his name for fellowships or clinical appointments at our teaching schools; but for the doctor, whoever and wherever he be, our aims are much less clear. There is needed a kindly heart, a gentle touch, the control to keep a confidence, love of children, with the power to make a decision and to accept responsibility."

Without these he is nothing. An experience of 38 years in trying to choose the best men for appointments at the end of their student career has shown the difficulty of selection by whatever means. Nor does psychology as yet offer any way whereby the desired characteristics may be foreseen five to seven years before they have to come together into action.

These younger men that today have in their hands the selection of medical students have indeed a hard task. But have they envisaged all that means? By the time we have responded to Wilfred Trotter's teaching that "it is no longer possible to conceal the wholly unique importance of medicine for the very existence of social life," I estimate the profession must be doubled. It is therefore not a problem of cutting down the numbers to those that the medical schools can hold, but of expanding the medical schools in size and number to take three or four times as many students as today until that number has been reached, and then stabilising them at double. Although the Barlow Report on Scientific Man-power did not specifically refer to medicine, the principles there laid down apply to us as much as to the qualified scientists with which it deals.

So far as I can see nothing has been done, as yet, in any way to attempt to tackle the problems of that report; and yet our continued existence as a nation must depend upon our efforts to do so as much as upon workers in mines, factories, and fields to increase production.

London, W.1. T. B. LAYTON.

BINOCULAR MICROSCOPES

SIR,—Dr. Shackle's letter of Aug. 14 is full of interesting observations, on which I have a few comments to make. But I would like to state clearly that what I am putting forward are only views and not carefully ascertained experimental facts.

The first important point is that whereas it is not tiring to use relaxed accommodation and parallel optic axes, or to use accommodation for 10 in. distance and convergence for 10 in. distance, it is also not fatiguing as a rule to change from one to the other. In other words, the idea that converging the eye axes after they have been rendered parallel, or vice versa, causes fatigue is, I think, wrong. The muscles are usually fully able to carry out these functions; presumably this is due to reciprocal innervation, which enables a muscle attached to one side of the eye to contract at the same time as its antagonist attached to the other side of the eyeball relaxes. The same statement applies to accommodation—that accommodation as such, from distant to near vision, or from near to distant vision, does not as a rule cause noticeable fatigue. What does cause fatigue is the necessity to accommodate for one distance and to adjust the eye axes for a different distance; and what is certainly in my case far more fatiguing still is the need for causing one field to be raised or lowered in respect of the other, to enable binocular fusion to take place. Whenever, therefore, I have experienced fatigue in using a binocular instrument it has been the vertical alignment have always scrutinised. I wonder if this is the of the discomfort that Dr. Shackle has experienced the converging type of microscope, which he in his letter? He might try putting prisms of angle, base-down or base-up, between one of the of this instrument and his eye, to see if this causes improvement.

To summarise: I cannot see any fundamental why the parallel type of microscope is superior or to the converging type. It may well be, however, one observer will have a personal preference for one than the other. If, having purchased one type, decided after further trials that the other type have been preferable, all that need be done is to suitable prisms above the tops of the eyepieces. the best results, these prisms should, of course, achromatic.

H. HARTRIDGE

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Director, Vision Research
Medical Research Co

PLANTAR WARTS IN SCHOOL-CHIL

SIR,—In 1947, at Walthamstow, 94 girls and 56 with plantar warts were referred for treatment the school health service. Since the facilities for this and other foot conditions are widely known borough, this figure of 150 cases can be taken fair indication of the incidence of plantar warts school population of 16,463. The monthly rates January, 13; February, 11; March, 7; April, May, 10; June, 8; July, 7; August, 1; Sep October, 21; November, 21; and December, 16. low incidence in August is of no significance, for dances at all clinics during school holidays considerably, but the slight rise in the next three may have resulted from increased activities, swimming, during the summer months. The for the year in age-groups was: infants (aged 5–7 juniors (aged 7–11) 27%; and seniors (aged 66%. The increased incidence in the 11–15 is probably due to increased participation in training, swimming, dancing, &c.

The right and left feet were equally affected. of the patients had one wart only; 11 had warts on one foot, and 12 had multiple warts feet; 80% of the warts were in the plantar area and anteriorly, and 20% on the heels, the majority being situated on pressure points. this series only one has been encountered on the area afforded by the longitudinal arch.

Treatment was carried out entirely by medical auxiliary chiropodists in the municip clinic. The standard treatment, adopted in most was as follows:

(1) Swabbing of the whole foot with surgical spirit.

(2) Removal of any mass of callous tissue to facil action of the acid to be applied.

(3) The area surrounding the wart is painted with or with tinct. benzoin. co. to prevent irritation by plaster.

(4) The wart is isolated with a stockinette cover in a small hole is cut about the size of the wart.

(5) 'Chlorosal' (salicylic acid 60%, chloral hydrate applied through the hole in the stockinette, and a cut so that no direct pressure results, is placed wart.

(6) The whole dressing is finally enclosed in st and secured with adhesive strapping.

The patient is instructed to keep the wart to return in 7–14 days, when the treatment is The above-mentioned procedure takes 6–8 min. for wart. On the average three treatments only are but two subsequent visits at monthly int insisted on for checking the results. Monochl acid and silver nitrate are occasionally used in chlorosal. This treatment is painless in most and where pain is experienced it passes off very The average number of attendances before final di was 5·6, and the average number of treatments 3 The results of treatment were assessed in 50 c who had completed their treatment not less than months previously. All these children were tak

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[1] *Lancet*, Sept. 4, p. 377.

BEDS FOR PULMONARY TUBERCULOSIS

Sir,—The correspondence on this vital subject initiated Dr. Bentley's article of May 8 and exacerbated by . Stradling's letter (Aug. 21) has caused Dr. Snell and colleagues (Sept. 4) to touch on the really important l thorny topic of the direct control of beds.

They say: “We do not think the bed position would greatly improved by giving the chest-clinic physician -ect control of all beds.” This statement should, I l, be approved if the sanatorium is to play its proper e in the tuberculosis scheme. The sanatorium physician ould have a large part in the allocation of cases to the atorium under his jurisdiction, if not the final word their admission. This is not so today. In giving this nsibility to the sanatorium physician three ends d be served: (1) it would help to bridge the gap een the clinic and hospital physicians; (2) it would r to making the central waiting-list less “central”; (3) it would ensure that the truly treatable case was at an early date by the physician who is to be in harge of treatment.

Every sanatorium is as good as its medical super- ident,” and the enhancement of the authority of the icians of these institutions would eventually rid the torium of much of its chronic and untreatable ilation to the benefit of the early case on which alone best results of treatment, especially chemotherapy, be realised.

M. M. NAGLEY
Assistant Senior Physician.

ove Park Hospital,
London, S.E.12.

SUPERNUMERARY NIPPLES

ir.—I have read with interest the letters following Harper's paper of June 12 on supernumerary nipples onnexion with neurosis, but I should like to know ther there are any figures for the occurrence of extra ples in the two sexes. I have never seen supernumerary ples in a woman, but have seen quite a number in . Whether this is merely a coincidence I do not w, but I have come to regard this abnormality as nmoner in men than in women.

anyuki, Kenya Colony. G. DUNDERDALE.

his letter has been shown to Dr. Harper, who replies follows.

r. Dunderdale, in expressing his belief that poly- lia is commoner in men than in women, is in line with classical opinions of Leichtenstern[1] and Bruce.[2] Leichtenstern's own 13 cases, 9 were in men, and n women. However, he extracted from the literature cases, of which 70 were in women, nearly all of whom e pregnant, and only 22 in men.

Bruce records 24 cases, of which 19 were males (9·1% 207 males examined) and 5 females (4·8% of 104 nales examined). Both observers recognise the following rces of error: (1) the variation in characteristics of groups examined; (2) the greater ease of detection of tiges at routine examination in male subjects, ighting the scale in their favour; and (3) the special tention directed to the breasts in pregnant women, fluencing the scale on behalf of the female sex.

Certain racial differences appear to exist. Among panese women 5·19–6%, and among Japanese men 68–2·03% are recorded by Iwai. For Chinese men the ure given by Takeya[3] is 3·6%.

de Cholnoky[4] has dealt with the phylogenetic signi- ance of supernumerary breasts, both on and off the nbryonic milk line, and believes that polythelia occurs equal numbers of persons in the two sexes, a conser- tive estimate being from 1 to 2% of the population. e draws attention to published figures giving the idence as high as from 14 to 23·3% of the popula- m, but believes his own estimate to be more exact. e has collected from the literature 64 cases of breasts atypical positions; 37 of these were in women and in men.

My own cases of supernumerary nipples in the nbryonic milk line include 72 men and 100 women. However, the preponderance of females at outpatient clinics and surgeries makes these figures of general interest only as regards sex incidence. The paper by Matthews and Baxter[5] deals with the much rarer occurrence of polythelia in subhuman primates. The small number of cases hitherto described include both males and females.

Should we require a reminder of the difficulties of statistical certainty in this field, we may remember these words from Darwin's “Origin of Species”:[6]

> “Rudimentary organs may be compared with the letters in a word, still retained in the spelling, but become useless in the pronunciation, but which serve as a clue for its derivation.”

Barnstaple. RICHARD HARPER.

DIRECT REDUCTION OF FORWARD DISLOCATION OF THE MANDIBLE

Sir,—Though forward dislocation of the lower jaw is not common it is by no means rare, and every general practitioner or casualty officer is likely to be called on to treat it. In this type of dislocation the condyle and the articular disc slip forward into the zygomatic fossa when the mouth is opened too widely. The usual textbook method of reduction is as follows:

> The patient sits in a chair, and the surgeon stands in front of him, introduces his well-protected thumbs into the patient's mouth, exerts pressure with the thumbs on the lower molar teeth downwards and backwards to disengage the condyle from the zygomatic fossa, and then with his fingers raises the chin.

In most cases this method is successful and can be performed without anæsthesia. But sometimes the reduction is not easy and the patient suffers agonising pain at each renewed attempt.

The following simple and effective method of reduction, so far as I know, is neither described nor taught in medical schools either in Great Britain or on the Continent. It does not call for anæsthesia, can be executed in half a minute, and is practically painless. The posture of the patient is irrelevant, and the protection of the surgeon's fingers unnecessary. The surgeon introduces his index finger (in bilateral dislocation both index fingers) into the vestibule of the mouth—i.e., between the cheek and the mandible—as far as a point $1^{1}/_{4}$ in. above the last lower molar, palpates the coronary process of the mandible (easy to palpate if the jaw is dislocated, but not when the jaw is in its normal position), and presses gently with the tip of his finger on the coronary process backwards and downwards, whereupon the condyle slips back into the mandibular fossa with ease.

This direct method has never yet failed me though I always used it in difficult cases where I was called when the textbook method had failed. Now that the casualty officers have learnt the simple trick they find it just as satisfactory as I have found it.

New York. G. MASCHANZKER.

SIXTY YEARS OF MEDICAL DEFENCE

Sir,—Your annotation on Aug. 14 put forward some cogent reasons for amalgamation of the two rival defence organisations. It appears that a strong case can be made for “pooling the experience and resources of the existing bodies” at the present time. In addition to the broad issues of policy and finance mentioned in this article there is a further point which may be worth consideration.

My principal and I are severally indebted for quiet sleep during an aggregate of some thirty years to the security afforded by our respective membership of the Medical Protection Society and the Medical Defence Union. Our reasons for joining the rival camps go no further than the individual predilections of the forensic-medicine lecturers at our different medical schools: neither of us is aware of advantages to commend either body in preference to its rival. But being together faced with allegations against our professional conduct, unfounded though we both believe them to be, it seems inefficient as well as irksome to be obliged to lay our common problem separately before two advisory

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1. Leichtenstern. *Virchows Arch.* 1878, 73, 222.
2. Bruce, M. *J. Anat. Physiol.* 1879, 13, 425.
3. Takeya, S. *J. orient. Med.* 1934, 20, 32.
4. de Cholnoky, T. *Arch. Surg.* 1939, 39, 926.
5. *Proc. zool. Soc.* 1948, 118, 144.
6. Darwin, C. Origin of Species. 6th ed. London, 1895; p. 377.

When one is sitting still and an attack starts to come on, it may be lessened and sometimes kept off by working the muscles. One may get up and walk about or contract and relax the muscles above the knees. This is not always successful with a very bad attack.

In, I think, 1911 I returned from abroad after having had typhoid fever. On my arrival at an English port I had an attack of the continuing paralysis which rendered me almost helpless for three weeks. I think the immediate cause of this particular attack was the strong sea air. We went inland and my father suggested that I should take cod-liver oil to pick me up. After a little time I noticed that almost all attacks of the paralysis had ceased, and my mother and brother therefore started to take the oil and with the same result. The oil is not, however, a cure, but a "keep off" and has to be taken continuously. It takes full effect in about a fortnight, and after it is left off the attacks are in evidence as usual in about the same time. The amount to be taken varies with the amount of exercise one takes and with other circumstances; but, roughly speaking, about 1 pint a week is enough. Less will help, but minor or medium attacks will probably occur. The oil enables one to live a more or less normal life, though of course not a very strenuous one. The continuing attacks never occur when one is taking the oil. When starting to take it, they are the first to go; and they are the last to reappear when it has been left off. In my experience only the pure oil does any good.

G. D. H.

*** Farquhar Buzzard's article provided the first record in Great Britain of periodic paralysis affecting more than one member of a family. In the same year Dr. H. D. Singer had reported a sporadic case in the summer number of *Brain*.—ED. L.

THE CROSSBOW OUTLET PELVIMETER

SIR,—I was interested in the instrument described by Mr. Morris (July 24, p. 139) for the obstetrical evaluation of the pubic arch. Two years ago I devised an instrument for measuring the anterior and posterior sagittal diameters of the outlet and have since used it on some eighty patients with pelvic contraction, who were sent for X-ray pelvimetry.

This outlet pelvimeter is of a crossbow pattern (fig. 1) and is made of brass, which may be sterilised by boiling and kept in 'Dettol' solution. It has three component parts—a half-circle of $3^3/_4$ in. diameter and with a transverse axial bar (which represents a hemi-section of the fully flexed and unmoulded, full-term fœtal head), a T-connecting piece, and a measuring rod. The transverse axial bar of the half-circle is $3^3/_4$ in. long, equivalent to the biparietal diameter of the fœtal head, and is incomplete in the middle to allow the measuring rod to pass as required; and two eminences are raised on the bar which appose the fitted connecting T-piece. The brass circumference is $^1/_{24}$ in. thick and $^1/_2$ in. wide, and has an opening at its apex through which the measuring rod passes. The T-piece is hollow and receives the cut ends of the transverse bar as far as its eminences, and through its vertical part, which is 1 in. long measured from the centre of the transverse axis, passes the measuring rod. A central screw can be tightened to fix the measuring rod.

The measuring rod is 8 in. long and has a curved sacral end to enable the posterior sagittal diameter to be measured; its scale begins at the straight end and finishes at the curve of the rod $1^1/_2$ in. from its tip. The measurement of the anterior sagittal diameter begins at the straight end of the rod, and is read down to the vertical bar of the T-piece, which adds 1 in. to the estimated length.

A measurement is made with the patient in the lateral position with both thighs fully and flexed. The circumference of the pelvimeter ap the pubic arch from behind and is gently pressed against its rami. The measuring rod is then through the brass rim to the apex of the pubic arch distance from the symphysis to the transverse read off. This is considered to be the true sagittal diameter of the pelvic outlet which is measured, since the available transverse diameter outlet occurs where the head will pivot and is positioned by the crossbar and may be in front of or behind the ischial tuberosities according to the width of the pubic arch.

Fig. 2 shows the pelvimeter in position in an average-sized pubic arch, and the anterior sagittal diameter measures 2·6 in.

Fig. 3 shows an anterior sagittal measurement of 3·6 in. in a pelvis with a narrow pubic arch. From an estimation of the anterior sagittal diameter in eighty cases it has been found that measurements above 2·8 in. indicate a narrow pubic arch, and the greater the measurement the narrower the arch.

Fig. 1

Without the pelvimeter being moved the posterior sagittal diameter is measured. The measuring rod is drawn sufficiently for the T-piece to pivot on transverse axial bar, and the curved end is touch the outer aspect of the sacro-coccygeal which has been located by moving the coccyx w fingers, one of which palpates from inside the This measurement has been shown to average and to be influenced by the length of the antero diameter of the outlet and the narrowness of the arch. In fig. 4 the posterior sagittal diameter 2·8 in. and in fig. 5 1·4 in.

D. J. M

Queen Charlotte's Maternity Hospital, London.

Figs. 2–5.

doubt examiners take these factors into account; he psychological effect of being deliberately misled ced with a patient who cannot coöperate is devas- g. From my experience I would say that the ination is an extremely poor method of differentia- those who have a wide knowledge of clinical medicine those who have not; and that the conditions are dically different from those obtaining in an out- nt department or ward that not even the most rienced examiner can detect which candidates are to excel in these fields. The art of taking a history least as important as the ability to elicit physical , and the former is scarcely tested at all in this ination.

myself lay no claim to a particularly detailed ledge of general medicine; I took the examina- in order to specialise; however, several of my ds whose experience and knowledge in this field far ed my own, and whose advice I often seek, have so been unable to pass the examination. I would e with "Would-be-Member" (Aug. 21) that the solution is to increase the time spent on the clinical ion, and if possible to see the candidate at work n outpatient department. This would no doubt e the examination even more tedious and expensive, it might ensure that this overrated title of M.R.C.P. conferred only on those who deserved it.

FORTUNATUS.

URINARY INCONTINENCE IN THE AGED

R,—Dr. Wilson's article of Sept. 4 is particularly able for its emphasis on training the bladder as one s a disabled limb or defective eye or even the actions peech.

stometry is still used far too little in both neuro- al and urological investigations. Some months ago ew attention to the value of this procedure in the ssment of children with enuresis.[1] Doctors today far too ready to send to the psychiatrist either the d or the adult who happens to be antisocial in that dder control is defective. Let us see that we call he psychiatrist as an aid in functional disorders and merely to rid ourselves of the tedium and burden ll investigations on an organic level.

ndon, W.1.　D. F. ELLISON NASH.

BOVINE PLASMA

R,—With reference to the articles on this subject h have appeared in your columns during the past years,[2] we should like to inform you of the results ined in our laboratory.

enatured calf plasma (D.C.P.) prepared by us exactly escribed by Massons (as well as a sample of D.C.P. pared by Massons himself) has been found to possess ng anaphylactogenic properties. In experiments guineapigs it was found that, while shock-provoking er is completely absent, the sensitising power is still ent, although the lethal dose of fresh bovine plasma guineapigs sensitised with D.C.P. is twice that necessary hock the controls sensitised with fresh plasma. The rval between the two injections was 45 days. In tice this would preclude the use of a preparation of se plasma but not of bovine plasma, since fresh ine plasma is not commonly used.

ven so it is of interest to record the disagreement ween our results and those obtained by earlier kers; this disparity would appear to be accounted by the technique employed by these workers, which obviously inadequate to demonstrate the sensitising shocking properties of plasma. In fact the latent iod increases with increase in the sensitising dose of igen; and it is very long for doses greater than 0·2 ml. of serum or plasma.

E. CARLINFANTI
Director
M. PONTECORVO
Assistant
Istituto Sieroterapico Italiano.

aples.

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[1] Practitioner, 1947, 159, 188.

[2] Massons, J. M. *Lancet*, 1946, ii, 341. Melka, J., Rapant, V., Zapletal, B. *Ibid*, 1947, ii, 382. Boesen, C. E., Larsen, V., Nielsen, A. K. *Ibid*, 1948, i, 325. Barsoum, H. *Ibid*, p. 346. Annotation, *Ibid*, p. 332.

ACUTE BENIGN DRY PLEURISY

SIR,—In the interesting article by Dr. Gray and Dr. Carter (Aug. 14) I noticed that this condition was referred to as Bornholm disease. Actually, the condition was first described in Telemark, Norway, by Dr. A. Daa in 1872, and it was later called Bamble disease, as the first cases were reported from a district of that name. The same condition was observed in Iceland by Finsen in 1856 and 1863, but his findings were not published until 1874. In the U.S.A. the disease was observed and described by Dabney in 1888. Syvest's splendid treatise on this subject was published in 1933.

Porsgrunn, Norway.　A. SCHRUMPF.

HANDLING OF FOOD

SIR,—The supply of pure food is, in theory, ensured by legislation; but failure to store and prepare it in cleanliness and freedom from contamination until it reaches the consumer is so common that one is tempted to suspect the absence of any legislation by which these measures may be enforced.

Similarly, the cleansing of cups, glasses, knives, forks, and other utensils used in the preparation and serving of food and drink is commonly carried out in so perfunctory and careless a manner that there is a real risk of infection. It is not that the local sanitary authorities are not empowered to use compulsion in these matters and in the maintenance of hygienic conditions in kitchens and larders where food is stored and handled; they are. Endeavours have been made to secure these ends, as Dr. F. A. Belam, medical officer of health for Guildford, has so aptly put it, "by persuasion," but people will always be found on whom persuasion has little effect.

It seems to me that the time has come for reviewing the whole of the legislation governing this subject and tightening it up. The duties of medical officers of health are so multifarious in these days that frequent inspections of premises may be difficult. A weak link in the chain from producer to consumer could easily be responsible for serious disease. Cases of food-poisoning are becoming far too frequent, largely because so many people now feed out in public restaurants who never did so before. Recent episodes which have occurred within my own experience will give point to my remarks:

A patient of mine went to her butcher's for the weekly meat ration. She described the shop as "full of bluebottles," which were flying about and settling on joints of meat in the window. While the butcher was conversing with another customer she noticed that his hand was slowly stroking a piece of meat. To her horror she saw that it was covered with maggots which the butcher was surreptitiously—as he thought—sweeping off with his hand.

A butcher, whom I knew to be suffering from a septic discharging sore on a finger, was handling meat with a bloodstained piece of rag round the finger. I asked him whether he thought it was a very good thing to do, not only for his own safety but for that of the meat. "Oh, the cooking will kill all the germs," he replied.

I saw a baker's roundsman taking loaves from his van and putting them in a basket for delivery to customers. He dropped one on the road, which was wet after a recent shower. He picked it up, looked at it, wiped it on the side of his trousers, and put it in the basket for delivery with the rest.

I was called to see a patient who had advanced carcinoma of the tongue and secondary involvement of glands in the neck which were on the point of breaking down. He had refused operation and hospital treatment. The stench was so horrible that I smelt it directly the front door was opened. The whole house reeked of it, and in his room, where the windows were shut, it was almost unendurable. He was also a chronic alcoholic—for which I did not blame him—and was in the habit of going out in the evening to two public-houses and returning home intoxicated after closing time. It was the practice at these public-houses to clean the tumblers by swishing them round in a receptacle of cold water under the counter and wiping them. They looked quite clean.

My wife and I went to a well-known London restaurant for luncheon at the most crowded time of the day. There were no tumblers on the table and I asked the waitress to bring some. She put them on the table dripping wet, and I noticed that the rim of mine was greasy and had traces bodies, notwithstanding their equal competence and trustworthiness.

This difficulty of two professional associates together faced with allegations on the same ground by the same patient cannot be unique. Would not the respective councils of the two bodies in which our confidence is placed do well to consider combining not only resources but advisory offices? That this would benefit the members of each by pooling experience and economising administration, is apparent. It would also save the feelings and time of any who may find themselves in the unfortunate position of my senior colleague or myself.

UNIONIST.

THE INTENDING EMIGRANT

SIR,—A peripatetic correspondent of Aug. 21 comments on the lack of preparation of intending emigrants. An Empire information bureau has been established by the Royal Empire Society to answer questions *inter alia* on living conditions in our Empire territories. Information on the very points mentioned—housing, clothes, cars, education—is given freely to all inquirers whether by post or in person. A series of information papers on living conditions has been prepared for seventeen Colonial territories; these can be consulted in many public libraries or can be obtained on application (enclosing postage) to this address.

ARCHER CUST
Secretary-General, Royal Empire Society.
Northumberland Avenue, London, W.C.2.

ASSOCIATION OF WHOLE-TIME SALARIED SPECIALISTS

SIR,—Further to the notice in your issue of July 17, (p. 127), the members of this association (formerly the Association of Municipal Specialists) feel that much was done in the past by the old association to secure for them adequate representation on important medicopolitical committees, and valuable advice has been given on salaries, legal problems, &c. This work will be carried on by the new association, whose four principal objects are as follows: (1) to improve the practice of medicine in all its branches; (2) to improve the status and promote the general interest of whole-time salaried specialists; (3) to provide opportunity for discussion on matters of professional interest and policy; and (4) to promote good relations between all specialists.

All whole-time salaried specialists are eligible for membership, and I shall be pleased to supply further information on request.

RUFUS C. THOMAS
Honorary Secretary.
45, Lincoln's Inn Fields, London, W.C.2.

HOSPITAL LIBRARIES

SIR,—Your annotation last week is a welcome indication to library workers of the increased value placed on the services which they administer. Your advocacy should encourage the new hospital authorities to provide adequate libraries for all kinds of readers—doctors, nurses, and patients—who look to them for books, and to realise the need, which you emphasise, for trained library staff. But your suggestion that the scientific and recreational libraries in hospitals should be combined is open to question. A committee appointed by the Library Association to consider the training of hospital librarians resolved in 1945 that these two categories of hospital library are incompatible. As you point out, it has been proved that recreational libraries are often best administered by the local public library. But the scientific literature required by the professional staff and auxiliaries, by the practitioners of the district, and by medical students must be dealt with, as the Library Association's committee agreed, by a distinct and specially trained staff.

W. R. LEFANU
Librarian,
Royal College of Surgeons of England.
London, W.C.2.

SIR,—The recognition in your annotation last week of the contributions of voluntary work in libraries for patients, is most encouraging to members of the Guild of Hospital Librarians. Our special aim is to contribute to the welfare of patients by loyal attachment to the hospital, and by increasing our own efficiency. publication of a quarterly periodical, the *Book T* forms a bond of union and interchange of More could be done by the guild with an increase membership, and we should welcome the coöperatio your readers in attaining that object.

MARY BUCHANAN
Chairman of the Guild Hospital Librarians.
102, Carrington House, Hertford Street, London, W.1.

THE DEAF CHILD

SIR,—In the article on this subject (June 12) in disabilities series I was surprised to see no mentk the school medical officer. Surely he is the man to parents on the track of obtaining help in such a Under the new Act the child does not need to be the books of a school to be eligible. Furthermore, writer's remarks about war-time London were strictly accurate. There was at least one school for deaf open; its name escapes me at the moment, it was situated just to the south of Victoria st school so noisy owing to the proximity of the trains only deaf children could possibly use it.

W. NORMAN TAY
Fort Hare, Cape Province, South Africa.

SHOULDER PAIN FROM PEPTIC PERFORA

SIR,—The occurrence of shoulder pain in peptic tion is widely recognised as evidence of irritation. The pain is generally felt on the right but may be bilateral, in which latter event it is that anterior perforation is causing irritation of median portion of the diaphragm.[1]

I recently operated upon a man for perforation gastric ulcer into the lesser sac. The usual signs symptoms were present, but, in addition, he had the *left* shoulder commencing at the same time generalised abdominal pain; this was presumably irritation of the left half of the diaphragm.

Most anatomy textbooks indicate only a relationship of the lesser sac to the crura of the phragm—chiefly of the upper recess with the right. Crymble,[2] in *Quain's Anatomy*, deals in more with the anatomy and variations of the lesser sac. bursa omenti minoris communicates on the left the bursa omenti majoris through the variab foramen bursæ omenti majoris. This latter itself subdivided into an upper and lower portion by plica cardiaca. It is this upper part which comes relationship with the left crus and lower posterior p of the diaphragm.

Lesser-sac perforations are uncommon, and I hesitate to draw conclusions on observation of only patient; but it would be interesting to know if surgeons have noticed left-sided shoulder pain in cases.

C. PATRICK
St. Mary's Hospital, London, W.2.

M.R.C.P. EXAMINATION

SIR,—I have read the correspondence on this sub with interest, since I passed only at the fifth att and I should like to supplement the criticisms of correspondents.

At my first attempt, in which I survived the part, I was told to look at a "short case" which examiner informed me was cardiological. It pro be one of obstruction of the vena cava secondary carcinoma of the lung: the patient certainly had which might be mistaken for cardiac failure, but examiner agreed that there was nothing wrong the heart, over which I had naturally puzzled for time. On another occasion I was given a man G.P.I. who refused to answer any questions wha On a third I was shown a man with syringomyelia was stone deaf: if one pricked him with a pin he say "sharp" or "blunt," but he had no other versation. The time that I passed, I had perfe straightforward cases, none of the patients be psychotic or deaf or otherwise debarred from giving history.

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1. Cope, V. Z. Early Diagnosis of Acute Abdomen, 9th London, 1946; p. 102.
2. Crymble, P. T. Quain's Elements of Anatomy, 11th ed., pt. 2. London, 1914; pp. 345, 354.

Obituary

THOMAS GWYNNE MAITLAND

M.A., M.D., B.SC. EDIN., D.PHIL. MANC.

T. G. Maitland, who died on Aug. 10, was from ntil his retirement in 1946 medical superintendent Cunard White Star Line.

ı at Merthyr Tydfil in 1875 he was educated at sity College School, London, and at the universities inburgh, Manchester, and Paris. In 1907 he ted in medicine at Edinburgh, and he was awarded tion for his M.D. thesis the following year. He ok an honours course in philosophy at Manchester, ding to the D.PHIL. in 1911. After holding a it appointment at the Brompton Hospital, he e demonstrator of physiology at Manchester, ter lecturer in the same subject at the universities les, Birmingham, and Manchester. For a time, ne was honorary physician at the Walsall and t Hospital. His literary interests led him to he *Manchester Medical Gazette* and to become tor of the *Midland Medical Review*. During the 18 war he was director of the typhus colony at je in Serbia, and he was made an honorary colonel in the Serbian Army.

1920 he joined the Cunard Company and for six he acted as medical officer in one or other of the hips which were laid down and commissioned to e those lost in the war. They were years which big development in winter cruising, and Maitland o meet the new problems which arose in mercantile ine as ships designed for the North Atlantic trips to be adapted for long voyages in semitropical s. In 1926, he succeeded Dr. David Morgan as d medical superintendent, with the task of supervis- he medical and nursing work of the ships, the al aspects of living on board ship, and the equip- of ships' surgeries and dispensaries and hospital lations.

th the requisitioning of ships for transport and other ork in 1939, a host of new problems had to be met. laitland's help was sought far beyond the confines own organisation. Nothing in the medical aspect at sea was beyond the range of his interest; he d out a good deal of research into seasickness, ample, and he took a large share in the establish- of the radiomedical service, whereby ships with octor aboard obtain medical advice by wireless.

he retired from the Cunard White Star Line, it ot long before he felt that he would like to go to gain. He made a long voyage, as ship's doctor, e Far East but found the heat too much for him. me back knowing that the voyage had not been a ss, and his friends realised that it had taken a great out of him.

laitland always said," writes R. C., "that he was uly a philosopher; but he was a very human one, is interest in workers on board ship and especially e docks led him with quiet but terrier-like determina- to insist that adequate first-aid centres and accident itals were established right in the heart of these erous occupations. The Merseyside and Birmingham dent Centres owe much to his persistence. Perhaps than any other man he improved immeasurably tatus and quality of ship's doctoring. Working in ackground, he brought his intelligence and keenness le support of industrial medicine, for his interests far beyond the sphere of his own job. He quietly raged young consultants to do a voyage across the tic and back, knowing that on a long-term view uld benefit both them and the mercantile medical e. Often he would gather together a little group ctors of diverse interests at a lunch party on one ships in dock. They were memorable affairs, and on all sorts of medical and other matters waxed nd furious. In his later years at least he was a oking man, with a limp from a painful arthritis e disability also of a duodenal ulcer, but these things ot crush his spirit. Meeting him, you were aware e that here was a remarkable personality, a man iet distinction and fineness of quality, a man moreover who delighted to pull your leg, who loved good talk and company, and who enjoyed both subtle wit and happy fun. With his death some of the warmth has gone out of life."

ANDREW RADBURNE FULLER

M.R.C.S., D.P.H.

Dr. A. R. Fuller, of Perranporth, Cornwall, who died on July 19 at the age of 55, was the elder son of Dr. Andrew Fuller, chief medical officer for England and Wales under the Local Government Board. He was educated at Leighton Park School and St. Mary's Hospital, at both of which he won open scholarships. In September, 1914, he went to France with the Red Cross as a medical orderly, returning in 1915 to finish his medical course. Immediately after qualifying in 1916, he was commissioned in the R.A.M.C. and posted as a battalion medical officer to a division in the Battle of the Somme. Early in 1917 he was sent home to spend many weary months in hospital and was invalided out in 1920. In the same year he took his D.P.H., and he joined his father in practice at Perranporth in 1921 where he remained until his death.

"Fuller," a colleague writes, "will long be remembered by all in Perranporth and the surrounding district for his medical ability and devotion to his work, which he combined with a sincere and unselfish love of his fellow men. He upheld the finest traditions of the profession. A keen athlete, he was a first-class cricketer and tennis player, holding the Cornish singles championship for three successive years and also playing first couple for the county."

Dr. Fuller married in 1925 Elizabeth Mary, younger daughter of Dr. Peter Ingram, of London, and he leaves his wife with a son and a daughter. A twin son died in 1943.

Appointments

DICKS, H. V., M.A., M.D. Camb., F.R.C.P.: senior psychiatrist, Tavistock Clinic, London.

GOODDY, W. W., M.D. Lond., M.R.C.P.: registrar, National Hospital for Nervous Diseases, London.

GRACIE, A. P., M.B. Edin., F.R.C.S.E.: accident officer, Salford Royal Hospital.

ROSS, M. S., M.R.C.S.: clinical pathologist, Queen Mary's Hospital for the East End, London.

WILDMAN, J. H., M.R.C.S., D.P.H.: M.O.H., East Herts combined sanitary district.

Colonial Service:

AZZOPARDI, E., M.D.: M.O., Federation of Malaya.
BARTLEY, A. H., M.R.C.S.: M.O., British Honduras.
CHELMICKI, B. J., M.B.: M.O., Gold Coast.
CLUNIE, THOMAS, M.B. Aberd., D.T.M.: senior M.O., Fiji.
CRISP, THOMAS, M.R.C.S.: M.O., Uganda.
HANSEN, A. G. P.: M.O., Tanganyika.
MAXWELL, R. W. D., M.B.: senior M.O., Fiji.
PHILLIPS, B. L. C., M.R.C.S.: M.O., Hong Kong.
RAPER, A. B., M.D. Lond., B.SC. Leeds, M.R.C.P.: senior pathologist, Uganda.
STEENSON, K. R., M.B.: senior M.O., Fiji.
WASE-BAILEY, B. N. V., M.D. Edin., D.T.M. & H.: asst. director of medical services, Sierra Leone.

Births, Marriages, and Deaths

BIRTHS

CUTTS.—On Sept. 1, in London, the wife of Dr. Geoffrey Cutts—a daughter.

FOX.—On Aug. 22, in London, the wife of Dr. J. P. Fox—a son.

ROCHE.—On Aug. 29, at Leeds, the wife of Dr. J. Roche—a son.

SHILLINGFORD.—On Aug. 31, in London, the wife of Dr. J. P. Shillingford—a son.

MARRIAGES

SEARS—CONN.—On Sept. 4, at St. Andrews, Harold Trevor Newton Sears, M.R.C.P., to Janet Sorley Conn, M.B.

DEATHS

FRENCH.—On Aug. 29, at Nairobi, Stanley Gay French, M.B. Lond., F.R.C.S., surgeon lieut.-commander, R.N., aged 40.

MARRIOTT.—On Aug. 30, Francis Keene Marriott, M.C., M.R.C.S.

MURRAY.—On Aug. 9, at Dornoch, Sutherland, David Alexander Murray, M.B. Edin., aged 50.

PATERSON.—On Aug. 28, in London, Arthur Robert Paterson, M.D. Brux., major I.M.S. retd., aged 88.

RASHLEIGH.—On Aug. 29, at St. Peter's-in-Thanet, Hugh George Rashleigh, M.R.C.S., aged 72.

WHEATON.—On Sept. 5, Samuel Walton Wheaton, M.D. Lond., F.R.C.P., D.P.H., aged 86.

WIGMORE.—On Aug. 29, at Minehead, A. J. O. Wigmore, M.B. Brist., squadron leader, R.A.F. retd., aged 63.

of lipstick. When I called her attention to it she wiped them hurriedly on what appeared to be a damp and dirty table napkin and replaced them on the table as "clean."

One has only to think of all the conditions in which infection is carried in the mouth—oral sepsis, diphtheria, syphilis, and the rest—and of common methods of cleansing drinking and eating utensils to realise the need for urgent reform. The answer appears to be threefold: legislation, education, and equipment. A study of the meticulously hygienic methods evolved and practised in the United States would be well worth while.

Brookwood, Surrey. H. M. STANLEY TURNER.

Public Health

NIGHTSHADE POISONING

Two outbreaks of nightshade poisoning have lately been observed in the south of England—one due to *Atropa belladonna* (deadly nightshade) and the other to *Solanum dulcamara* (woody nightshade).

DEADLY NIGHTSHADE

On the afternoon of Sept. 1 a party of children went blackberrying, at Milton, Portsmouth, on a plot of waste ground where, entwined among the stems of two large blackberry bushes, were several deadly nightshade plants, also bearing large black berries. The next day five of the children were admitted to hospital with acute belladonna poisoning.

The first three children to be admitted were two sisters and a brother, aged 7 and 8, who were said by their mother to have returned home at about 5 P.M. on the previous afternoon. Complaining of tiredness and thirst, they refused tea, but appeared normal; and two hours later, at 7 P.M., they went to bed and slept. At 9 P.M. they were awake, and in rambling speech complained of being unable to see. One child "kept falling about the room," and their mother thought that all three had a high temperature. On admission to hospital the next morning, all three were very restless, constantly executing purposeless movements, twisting about, grimacing, and plucking at the bedclothes. Two were talkative and obviously hallucinated, and their speech was a little slurred; the third, who lay with her head buried in the pillow fiercely resisting interference, seemed to have some photophobia. All three had hot dry skins and a pronounced malar flush; the lips were dry and fissured. The pupils were widely dilated and unresponsive to light; all tendon reflexes were brisk. The pulse-rate in each case was 120–130 per min.; the temperature was normal and the respiratory-rate was not increased. The highest blood-pressure was in the boy, in whom it was 138/80 mm. Hg.

Later the same morning a fourth child was admitted. After returning from the blackberrying expedition on the previous day he had had a large tea at 6 P.M.; at 9 P.M. he had gone to bed, apparently well. At 2.30 A.M. he was found struggling with his elder brother; he spoke incoherently, seemed not to recognise his parents, and kept picking imaginary objects off the bedclothes. At 4 A.M. he was given morphine by his doctor, and remained drowsy until admission at 1.30 P.M.

Soon after this, a fifth child, aged 6 years, was admitted. On his return from blackberrying he had had supper at 7.30 P.M. and gone to bed. During the night he was awake and twice vomited. At 6.30 A.M. both parents went out, leaving him in charge of an elder sister, who had summoned help at 12.30 P.M. because he was talking strangely.

Treatment.—On admission gastric lavage was carried out on all five children, first with plain water, then with potassium permanganate gr. 10 to the pint. This induced vomiting. Among the first three cases, over 30 berries were recovered from the boy's vomitus and nearly as many from that of each of his sisters. The berries in the gastric contents closely resembled raisins, but the seeds were smaller and darker than raisin "stones." No berries were recovered from the stomachs of the last two admissions. From rectal wash-outs no seeds or berries were recovered. Four hours later gastric lavage repeated and in the first three cases several more were obtained. In each case a solution conta magnesium sulphate gr. 90 was introduced into stomach.

Progress.—Late on the evening of Sept. 2 the child condition was not appreciably changed; all were extremely restless and hallucinated, with persiste high pulse-rates. All were incontinent; but there no evidence of urinary retention. During the night slept sporadically, and by 9.30 the next morning (Se all except the boy *in the first group* were quieter and f coöperative, though suspicious and resentful of ex tion. They complained of great thirst, and two of of severe frontal headache; malar flush was still nounced, but the pupils were smaller and reacted sl to light. The saline aperient was repeated; and evening large numbers of seeds and berry skins were being passed by each of the first three cases. Of t three, the boy is estimated to have eaten at least berries and his two sisters 20–30 each. The physic charge of these patients adds: "Why no berries or should be recovered from the other children, w *symptoms were no less severe, is a mystery.*" important features in these cases, he suggests, a follows:

1. The long time between the ingestion of the berries the appearance of symptoms.
2. The prominence of hallucination and the abse fever or respiratory depression.
3. The significance of "raisins" in the vomit (unlike deadly nightshade berries), which might not have appreciated in the absence of a history that berries had eaten.
4. The *necessity in such cases as these* of administer emetic; many of the berries would have blocked the stomach-tube.

WOODY NIGHTSHADE

A girl, aged 9 years, was admitted to hospi Canterbury on Aug. 13, with abdominal pain, vomiting, and distressed breathing. She had been habit of eating berries from hedges near her home, had last done this 3 days before admission. The foll day she had felt unwell but had improved. She vomited "coffee-ground" material four times duri five hours before admission; there was no diar She looked exhausted and anxious; her pulse-rate 140 per min., and her skin was pale and dry. Her p were of normal size and reacted to light. Treat included gastric lavage, soap-and-water enemas, n amide, and latterly oxygen; fluids were given by m and per rectum. After 24 hours her condition, which improved somewhat, deteriorated again, with incre weakness, cyanosis, and feeble respiration. She died the morning of Sept. 15.

At necropsy the principal finding was acute infla tion of the mucosa of stomach and small int decreasing in intensity towards the distal end. An of the liver revealed the presence of solanine.

Notification of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended Aug		
	7	14	21
Cerebrospinal fever	40	38	26
Diphtheria	107	100	116
Dysentery	111	107	111
Encephalitis lethargica	..	..	3
Measles, excluding rubella	6870	5807	4611
Ophthalmia neonatorum	44	75	59
Paratyphoid fever	47	10	20
Pneumonia, primary or influenzal	363	282	266
Polioencephalitis	5	2	6
Poliomyelitis	38	37	72
Puerperal pyrexia	135	88	100
Scarlet fever	848	774	736
Smallpox	..	..	..
Typhoid fever	10	8	8
Whooping-cough	3185	3458	3260

INICAL RESEARCH IN THE EDUCATION OF THE SPECIALIST *

W. MELVILLE ARNOTT
T.D., M.D., B.Sc. Edin., F.R.C.P.E., M.R.C.P.
ILLIAM WITHERING PROFESSOR OF MEDICINE IN THE UNIVERSITY OF BIRMINGHAM

NE hears much these days about research; indeed in tion to clinical medicine it almost threatens to become one of contention. Clearly, there is a wide difference he interpretation of the term. To some research is to be synonymous with the paraphernalia of the ratory and with the esoteric techniques of modern nistry and physics; to others it is the production papers; and to all too few it is essentially an llectual approach.

ne of the most attractive and stimulating articles he appointment I hold is that which charges me the personal conduct, organisation, and direction search. The endeavour to discharge this obligation ssitates much thought and experiment directed to rtaining the optimum methods of design and prose- on of investigation. These are pressing matters h face many; feasible solutions are vital to the ess not only of the many whole-time university cal departments that are being established but also e whole future of clinical practice.

the various recent memoranda on specialist training have come from the Royal Colleges there has been rm insistence on a period of a year or so of the ears of apprenticeship being spent in work in the ed basic sciences. There is a tendency to imply this year should be non-clinical and should be in the departments of anatomy, physiology, stry, &c. Though these departments provide able training, it should be possible to provide equally and perhaps even better opportunity for training scientific method in clinical departments. Indeed listinction will, I feel sure, become increasingly ous as the preclinical and clinical departments of nedical schools find increasing community of effort ching, research, and clinical practice.

ere has unfortunately been in the past a measure sociation between those in laboratory work and in clinical practice, which has been harmful to groups and has been due to faults on both sides. non-clinical scientist has sometimes believed that linical colleague is not only incapable of but even emptuous of the scientific method, while the clinician is turn has sometimes felt that the "lab man" is l to the problems of clinical practice and insensitive he humanitarian appeal. Such schisms are closing, medicine, in Britain at least, is entering an era ntegration and coöperation which will favour new overy and rational practice.

STATISTICS

hat contribution should the study of research hods, or the actual prosecution of research, make to training of the specialist in medicine? Obviously he allotted time it can give comparatively little by of detailed technical knowledge. Its main purpose t be to develop the habit of mind which is attuned he challenge of the unknown, is continually seeking mprove the precision of observation, and in the cise of diagnosis or the assessment of therapeutic t places reliance on phenomena in inverse proportion heir inherent variability. Whatever else is learnt edical training, a sound appreciation of the value e quantitative approach is essential. The evolution of every branch of science has been through the descriptive stage to the maturity of the increasingly precise application of the quantitative language of mathematics. Biology, and particularly clinical biology, has presented peculiar resistance to this evolutionary process, but this is being steadily overcome. One has only to consider the development of clinical chemistry and the recent rapid development of quantitative methods in the clinical physiology of the cardiovascular system to realise the increasing application of physical and chemical techniques to human function and dysfunction.

The most important forward influence is the steady penetration into clinical practice of the principles of statistical thought. The intelligent practice of medicine, and especially investigative medicine, is inescapably bound up with degrees of probability and improbability based on accumulations of numerical data. It is not so long since the techniques of statistical analysis were reserved for the vital statistics of large populations and were the exclusive perquisites of the Registrar-General, the medical officer of health, and the insurance actuary. However, the brilliant researches of R. A. Fisher and his colleagues have developed the mathematical treatment of small groups of observations, and the methods evolved at the Agricultural Research Station at Rothamsted are eminently suited to the numerical observations of the ward and of general practice. Most of the reputable medical journals now require numerical data submitted to them to show evidence of quantitative assessment of degrees of significance or of correlation, and an increasing number of valuable contributions have only been possible by the application of the more advanced methods of the analysis of variance, &c. Unfortunately it is still possbile to cull from current medical literature numerous examples of false conclusions based on the uncritical assembly of quantitative observations.

The education of the doctor, be he a specialist in clinical practice or a specialist in clinical research, requires not so much the acquisition of mathematical techniques as the development of a sense of the variability of biological measurement and of the existence of methods of measuring, controlling, and explaining this variability. The modern medical teaching and research organisation has its statistical department to which the research-worker can turn not only for guidance in the assessment of results already obtained but also for the design of experiment to ensure that the maximum of information is obtained with the minimum of effort. I believe that much of the aversion to the use of quantitative methods in clinical research is due not so much to any inherent difficulty in grasping the common-sense principles as to the drudgery of the arithmetic involved. For that reason I encourage all members of my department to make the fullest possible use of the slide-rule, the Otis King Calculator, the electric calculating machine and books of mathematical tables. Emphasis should also be placed on the amount of information that can be got from the simple graph. Graphic records in clinical work tend to be restricted to records of temperature, and pulse and respiration rates, while much valuable information is missed and many suggestive correlations pass unnoticed because nobody has bothered to plot other observations. I heard of a teaching hospital in which the only height yard stick was in the nurses' home, and nobody had even heard of a patient's height being recorded, with the result that it is impossible to relate the wealth of numerical data contained in its case-records to the norms of height, weight, and age.

The habit of quantitative and statistical thought is not only essential to research but also has a profound influence on the quality of observation without which good practice is impossible. A person so trained is continually questioning the accuracy of the data on which he makes his diagnosis or modifies his treatment.

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n an address delivered to the Harveian Society of London on lay 19.

Notes and News

CASE OF OSCAR WILDE

Fifty years ago Oscar Wilde was not mentioned in polite society. The account of his trials, now published in full[1] under the editorship of Mr. Montgomery Hyde, might then have been brought to the notice of a metropolitan police magistrate for possible suppression and punishment as an obscene libel. Times have changed.

In 1885, during the passage of the Criminal Law Amendment Bill which dealt with the protection of women and girls, Labouchere secured the insertion of a clause (afterwards section 11) creating the offence of indecency between male persons in public or private. Under this section Wilde was eventually tried ten years later. Son of the well-known Irish ophthalmic and aural surgeon, Sir William Wilde, he distinguished himself in classics at Trinity College, Dublin, and, going on to Oxford, obtained two first-classes and the Newdigate prize for English poetry. He married the daughter of an English Q.C. and had two children. If the extravagances of his cult of æsthetic philosophy were caricatured in W. S. Gilbert's *Patience*, his poems and fiction were not to be despised, and his plays were brilliant.

At the age of 38 he made the acquaintance of Lord Alfred Douglas, then 22 years old, the third son of the eccentric Marquis of Queensberry. Father and son hated one another. Violent and vindictive as the Marquis was, he had some justification for objecting to Wilde's intimacy with his son. After threats and abuse, he went to Wilde's club and left for him with the hall-porter a card with the curiously mis-spelt inscription: "For Oscar Wilde posing as somdomite." Largely influenced by Lord Alfred, who saw a chance to strike at his father, Wilde prosecuted the Marquis for criminal libel. Sir Edward Clarke, first obtaining from Wilde the most solemn assurance that there was not, and never had been, any foundation for the allegations against him, undertook the prosecution. Carson was briefed for the defence; the Marquis filed particulars in justification and pleaded that publication had been for the public benefit. Wilde in the witness-box held his own for a time against Carson's cross-examination, displaying the sparkling, if flippant, wit which distinguished his two plays (*An Ideal Husband* and *The Importance of Being Earnest*) then drawing big audiences. But a change came when Carson put to him the names of a series of youths of humble station to whom (as Wilde admitted) he had given dinners, money, and valuable presents. If these young men were called for the defence their evidence might be discounted as that of self-confessed accomplices and, in some cases, blackmailers; but Clarke, highly competent and experienced, advised the breaking off of the prosecution. The Marquis, after all, had accused the prosecutor of "posing," not of actual commission of the crime. A verdict of "Not guilty" was entered and the particulars of justification were thus accepted. Carson's clients sent to the director of public prosecutions a copy of their witnesses' statements; a warrant for Wilde's arrest was applied for; he had time to fly the country, but he did not go. Clarke, maintaining at all times the highest standards of the bar, wrote an offer to defend Wilde without fee in the proceedings which followed.

The arrested man needed indeed all the help he could muster. The press was hostile; his books were struck out of publishers' lists; one of his plays was taken off forthwith, the other a few weeks later; money was short. Charles Gill prosecuted him at the Old Bailey, Carson refusing to have anything more to do with the case. The jury disagreed after five days and a re-trial was ordered. This time the solicitor-general, Sir Frank Lockwood, was for the prosecution; no stone was left unturned. Wilde was convicted and Mr. Justice Wills imposed the maximum sentence of two years' hard labour.

The *Ballad of Reading Gaol* and the biographical memoirs of Lord Alfred Douglas and others kept alive, not without recrimination, various personal questions which matter little now. Had the trials taken place today, the court might have been invited to consider Wilde's mental state. Mr. Montgomery Hyde, in his careful editing of the proceedings, adds one appendix on "The Problem of Wilde's Inversion" and another on "The Prevalence of Male Homosexuality in England." He recalls that, during a debate in the House of Lords in July, 1937, Lord Dawson of Penn homosexuality was now regarded as a pathological might even some day be deemed an "insufficienc or at any rate as much disease as crime. It may take another fifty years to convince the judges and public that these cases are other than—to quote Lo opinion delivered in the same debate—"the result impulses which, like other wicked impulses, are being controlled and can be checked by advic resolution."

OPTION UNDER SUPERANNUATION RE

In a circular letter (E.C.L.80) the Ministry of H out that those practitioners who wish to contract National Health Service superannuation scheme notice by Oct. 4. This option, as was explained in July 3 (p. 30), is open only to those who are insurance policies.

OUTPATIENT FACILITIES FOR PSYCHIATR

The National Association for Mental Health published a 43-page directory of child-guidance outpatient clinics for adult patients. Addresses a *all counties in England and Wales and Norther* Scottish inquirers are referred to the Scottish Ass Mental Hygiene. General practitioners, almoners, workers will find this list useful. Copies may be (1*s*. each or 11*s*. per doz.) from the N.A.M.H., 39, Street, London, W.1.

Edinburgh Post-Graduate Board For Medic

On Thursday, Sept. 16, at 4.30 P.M., in the anato theatre of the university, Prof. J. C. Brash will Modern Trends in Anatomy.

Institute of Laryngology and Otology

On Tuesday, Sept. 14 at 5.15 P.M., at the Gray's Inn Road, London, W.C.1, Dr. A. C. R speak on Dermatology as it concerns the Ear, Throat.

Institute of Psychiatry

Lecture and demonstration courses for students in psychiatry will be held at the institute coming session. Further particulars may be had secretary of the institute, Maudsley Hospital, London, S.E.5.

Royal Free Hospital

On Friday, Oct. 1, at 3 P.M., Mr. L. E. C. N deliver the inaugural address of the school of the Beveridge Hall, Senate House, University of Malet Street, W.C.1. He is to speak on the Imp Team Work with special reference to Hospital Li

British Tuberculosis Association

At a meeting of the association to be held at 26, Place, London, W.1, on Friday, Sept. 17, at 3.15 R. D. Lawrence and Dr. I. M. Hall will speak on losis and Diabetes, and Dr. L. E. Houghton on Therapy and the Bronchus.

International Congress on Industrial Medic

Members of this congress, which will open at th Hall, Westminster, on Monday, Sept. 13, at 11 may register on Sunday, Sept. 12, from 10 A.M. t at Church House, Great Smith Street, S.W.1, and on 14, and 15, at Caxton Hall, Westminster, from 9 to and from 12.15 to 2.30 P.M. During the con secretary, Dr. H. J. Davies, may be addressed at at Caxton Hall.

Air Ambulances.—Morton Air Services Ltd., who a world-wide service of air ambulances from Croydon inform us that their additional address at Liverpool, their advertisement of Sept. 4, has been cancelled.

Corrigenda.—The opening address at the *Congress on Population and World Resources* was g Lord Horder. Sir John Boyd Orr opened the disc the first session.

In the directions for the use of '*Clinitest*' p. 309) five drops of urine plus *ten* drops of water be placed in a test-tube.

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[1] *The Trials of Oscar Wilde.* Edited by H. Montgomery Hyde, with a foreword by Sir Travers Humphreys: Notable British Trials Series. London: Wm. Hodge. Pp. 384. 15*s*.

ved of one or more of his customary guides. Such lity of mind is compatible with an extensive stock eoretical knowledge and even with the capacity to with clarity and persuasiveness. In my opinion, ver, such men are entirely unsuitable for research or senior medical educational responsibility, because y important function of university education is to what is known in the light of what is not known to foster the attitude which regards the knowledge day as a base from which to evolve the knowledge morrow.

elegant type of research is that which begins an assembly of the available knowledge of some icular phenomenon and the erection on this basis hypothesis which seems to fit the data. This thesis is then used to predict the results of one or series of experiments. These experiments having performed, the degree of correlation between the icted and observed is a measure of the validity of hypothesis. More often than not in clinical science technique gives a somewhat imperfect correlation cating that some substantial variable has not been reciated, or, as one statistical technique expresses it, "residual variance" is of considerable magnitude. illustrations will illuminate this approach:

ldblatt, from a wide range of unconnected clinical, ological, and experimental data, formed the hypothesis permanent reduction of renal blood-flow in mammals nced systemic hypertension. He tested this concept by ated reduction of the lumen of the renal artery in dogs, a relatively complete vindication of the validity of the thesis.

me months ago in our own laboratory a research reached nt at which it became necessary to know with as high gree of certainty as possible whether the air inspired a deep breath was accommodated by an increased nsion of the alveoli in use during quiet breathing, or her additional "reserve" alveoli became ventilated. a knowledge of the volumes of the residual air, alveolar omposition, &c., and by the use of known degrees of xture with an inert gas it was possible to predict the titative changes in alveolar air which could be expected he basis of each of the conflicting hypotheses. Experital observation furnished a very close correlation with the lt predicted on the basis of the large breath being mmodated by distension of the same alveoli used in t breathing.

TRAINING OF RESEARCH-WORKERS

he beginner in research should not be allowed to ark on a project without preparing an outline of hypothesis to be tested and of the possible answers ch the experimental approach may yield. Often ugh this preliminary theoretical approach will reveal t the design of experiment is fundamentally incapable ielding the desired information, a discovery which is ter made before time and effort are wasted. Though nay be clear from the outset that a certain minimum xperiments will be necessary to establish a significant wer, that should not deter the worker from the analysis the results at short intervals. There is no more llectually satisfying experience than to watch the ree of significance steadily increase with replication, on the other hand there is no more mortifying trial to discover after weeks or months of labour that effort expended is largely in vain because some redicted factor or frank error has marred the results. novice should be taught that it is when the results s experiments seem most mysterious and inexplicable he is most likely to make a new and exciting overy. In research as in other spheres of endeavour when things go wrong, and doubt and difficulty t, that ingenuity, morale, and stamina can best be ssed.

ften enough the beginner essays a research project too broad and general in scope to allow of any real progress within a reasonable time; or necessitating such a range of technical processes as to imply an attack by a carefully selected team of experimental investigators. Without experienced direction the result is inevitable disillusionment and frustration, with the acquisition of a sadder and not necessarily wiser frame of mind, all too often tinged with cynicism and revulsion to investigative activity. The approach to a specific research project is along exactly the same lines as the conduct of a military operation—i.e., by the exercise of the scientific method. The problem to be solved is equivalent to the objective whose capture is desired. A critical study must be made of the available information—i.e., in the words of a famous manual of military tactics, "Time spent on reconnaissance is rarely wasted." A careful assessment must be made of the available resources in terms of apparatus, clinical material, and, above all, of the time required to acquire the necessary skills and to perform the experiments. Finally, a very generous time margin must be allowed for unforeseen delays due to technical difficulties, lack of suitable cases, and, to continue the military analogy, for unexpected resistance and difficulty in the reduction and consolidation of intermediate objectives. A full appreciation of the problem both in its abstract and concrete details will often reveal to the beginner the impracticable nature of his scheme; he will realise that he was proposing to engage on a corps front with battalion strength.

It is true that the measurement of cardiac output by the application of Fick's principle and the obtaining of samples of mixed venous blood from the right heart constitutes a valuable procedure, but the actual insertion of the cardiac catheter, in itself not very difficult, is only a dramatic incident in a broad background of skilled collection and gas analysis of samples of blood and respired air. The beginner will probably take much longer to acquire the necessary skill in handling the Van Slyke manometric apparatus than in learning to insert the catheter. If one adds to that the simultaneous recording of right auricular pressure by a Hamilton or Warburg manometer, the whole process becomes a matter for a highly trained team at least one member of which must be exclusively engaged in this work.

The use of radioactive isotopes in clinical research opens up glittering vistas of conquest of knowledge, but while deceptively simple in theory these techniques are complex and costly in application and are beyond the scope of any but the specially trained and experienced investigator.

It is sometimes necessary to disabuse the beginner of the notion that for him clinical research can be done by merely arranging for a series of tests to be performed by the biochemist, the clinical pathologist, or any or all of the various special departments found in the large modern hospital. Though the experienced clinician trained in research method, working in partnership with the biochemist, clinical pathologist, radiologist, &c., can achieve results of the highest order, "request reform research" methods in the hands of the inexperienced can become rich mines of misinformation and often prove an intolerable imposition on the various special departments.

In brief, it is one of the most important duties of the research director to guide his charges to a limited problem which is well within their scope and to make it perfectly clear to them that they must be prepared to carry out the technical details themselves at least as well as any technician. Only thus can they appreciate the variability of the measurements, and in actually doing the work themselves they are much more likely to see new and fruitful avenues of approach.

I know of a famous American laboratory where the research-workers have the minimum of technical assistance but adequate accommodation and excellent workshop facilities. This compulsion to find out and "do" for themselves provides ideal training. I look back with appreciation to the time when for months on end my colleague and I had to measure

He knows that the emphasis he can place on, say, his clinical location of the apex-beat as an index of heart size is strictly related to the accuracy of this method as checked by radiological or pathological examination; that the significance of pain in the right shoulder as evidence of gall-bladder disease depends on how often it is present in proven cases of disease of that organ and how often without such disease; and that the accuracy of the diagnosis of tuberculosis is much impaired if the tubercle bacillus is not isolated.

Quantitative and critical thought confers some immunity to the cardinal sin of certitude, the commission of which betrays a flaw as fatal in the daily practice of the physician as in that of the laboratory worker. Respect for authority in science is based not on the ex-cathedra pronouncement but on the production of sound evidence which stands the test of significant correlation with observation. Clinical practice divorced from scientific discipline undoubtedly leads, or rather has led, to an atmosphere of authoritarianism in which the neophyte does not appreciate the difference between dogma and deduction, comes to have an undue veneration for the logos, and is apt to be blinded to the existence of gaping cracks in the structure of knowledge. Such a dangerous and prematurely senile attitude of mind will not develop in an organisation dominated by a spirit of inquiry in which patients are diagnosed in the light of the most accurate observations, both historical and physical, that human ingenuity can devise and are treated by the method which seems most rational, all with the keenest appreciation of the fallibility and imperfections of these procedures and with the dominant ambition to acquire new knowledge which will lead to better methods.

USE OF LITERATURE

An important part of training in scientific method consists of the proper use of literature. It is fatally easy for the medical specialist to fall into the habit of reading only the journals dealing with his particular branch. Not only must the trainee learn the use of the *Cumulative Index Medicus* and the pitfalls of being content with second-hand cited references, but also he must have ready access to those journals which report applications of the scientific method to clinical problems. Among this group, mention must be made of *Clinical Science* and the *Journal of Clinical Investigation*. The *Journal of Physiology*, though only in minor degree clinical, provides particularly good examples of the proper conduct of biological investigation. Ready access to complete sets of these journals is essential. *Nature* and *Science* provide breadth of outlook and are a fruitful source of new methods. From time to time discovery and technical advance in one department of science may provide the clue which will overcome an impasse in an investigation in a totally different field. Study of good scientific literature develops an appreciation of the importance of the proper reporting of observations and of the relatively ephemeral value of hypothesis and speculation. A large proportion of the interpretation and conjecture in scientific reports is, of necessity, incomplete or even erroneous, but data, especially quantitative data, adequately detailed with sufficient account of the methods to enable reproduction by others, is of enduring value and may provide an indispensable link in a chain of evidence which leads subsequent investigators to some important advance. Though it is given to few to make major forward steps, it should be within the power of many to contribute an accurately fashioned piece to the mosaic of knowledge.

DISCUSSIONS

The colloquium or seminar is a valuable feature of the clinical unit. It provides an opportunity for the trainee specialist to give an account of the progress of his research and to have his particular discussed. It should be the accepted thing that, research comes to an apparent impasse—and that, in limited experience, is frequent—because of either tec difficulties or incomprehensible results, it should be on the agenda for the next seminar. This not provides an opportunity for others to share the exercise of the problem but also is surprisingly of solution. Such meetings are all the more valua as in the case of my own department, they are reg attended not only by clinical colleagues but also physiologists, pathologists, pharmacologists, and ticians. Such meetings should be quite distinct staff clinical meetings, in which the emphasis is on the study of the diagnosis and management individual cases. In addition, directors of should make a point of introducing, as often as their junior associates to the scientific proceedings such societies as the Medical Research Society, Physiological Society, and the Pathological Those whose investigative efforts meet with success become eligible for membership of these societies.

TYPES OF RESEARCH

One comes now to an important aspect of the tion of research and specialist training—i.e., a of the types of investigation. Such is necessary to be in a position to give counsel to the novice. times, of course, little advice is needed, in that beginner comes with a clearly defined and problem which is well within the capabilities of individual, the technical resources of the d the supply of suitable cases, and the time a Such a happy project is, however, extremely rare. it presents, the originator should be the object of ticularly close supervision, because, if to his pr be added diligence and adaptability, he is likely worthy of rapid advancement in investigative m

Apart from obligatory elementary training in methods which may become an essential part of training, the reasons which impel young men to time to investigation are often obscure. Some merely want to produce a thesis acceptable for a degree; others may be profoundly dissatisfied the glaring imperfections, obvious inconsisten scarcely warrantable assumptions which ch the established body of knowledge of some phy phenomenon or disease process; others may constituted as to derive substantial mental and satisfaction from the systematic approach to a A few obviously have uppermost in their minds desire to find out whether they are capable of research, and if so whether a career devoted to research work or the combination of routine practice with a research problem will provide the outlet for their ambitions and abilities. It is impo for those charged with the heavy responsibility selecting candidates for the range of activities lie between, on the one hand, a short training in principles and methods as a part of specialist and, on the other hand, a career devoted to wh research to realise that "job selection" is as yet at best approximate, and that the acid test is observation during a trial period. Some types almost from the outset, clearly unsuited for more than elementary instruction in scientific m as applied to clinical problems. Such persons unusually dependent on guidance, both in their clinical work and in the laboratory; they attach emphasis to the opinions of seniors and have an un regard for accepted hypotheses and dogma and aversion to resolving problems to first principles. T may be likened to the navigator who is seized panic when he finds himself in an unusual situ e, he might soon cease to be a useful practitioner irector of research.

this connexion it is well to meditate on the hapgs in the Museum of Alexandria some 2200 years luring the reigns of the first two Ptolemys. At ime, in that place, there occurred one of the greatest s of scientific discovery in the history of mankind. d and Apollonius placed geometry on a secure ıg, Eratosthenes calculated the size of the earth ame within fifty miles of its true diameter, Hero the first steam engine, Archimedes made several physical demonstrations, and Herophilus contril extensively to anatomy. Few of these great veries made any contribution to the welfare of for over 1500 years, because at the time there ed a complete social gulf between the scientist and artisan. This is in sharp contrast with another escence of genius which occurred in Birmingham ıe latter half of the eighteenth century. At that there existed the Lunar Society, whose members ded such masters of pure science and applied ıology as James Watt, Matthew Boulton, Joseph stley, Josiah Wedgwood, Erasmus Darwin, and iam Withering, under whose influence there was ırkably little delay in the application of inventive ıs to practical problems.

FUTURE OF RESEARCH

is very clear that it will be many years before there be adequate facilities for including research experiof the type outlined in the training of all specialists. act the position will become satisfactory only when of the senior practising specialists have themselves ived such training and are actively educating their rentices in scientific methods along with instruction e purely vocational detail of their specialty. Develop-t depends not so much on material resources in ks, mortar, and costly apparatus—though these a part—as on the multiplication of people whose practice and teaching are consciously, indeed ressively, governed by the rigorous standards of ntific thought. This is not in any way antagonistic he so-called "art of medicine"; indeed the needs humanity are best served by the methods of ight and practice, in particular the habit of rigorous criticism, which are inherent in science.

n the first instance this type of training will of essity be confined largely to teaching hospitals, e such habits of thought and practice require the nulus of preclinical departments and of broad contacts h university faculties of science. One detects a idency in certain circles to suppose in the New Order t the teaching hospitals will be exclusively engaged the instruction of undergraduates, while postgraduate ecialist training will be relegated to non-teaching regional hospitals. Though much practical clinical perience will necessitate work in these hospitals, al isolation from the universities and their hospitals uld be utterly disastrous. I suggest that the aim uld be to group regional specialist centres in the sest possible geographical, organisational, and inteltual relationship to the university. Only thus will re flourish a tradition which is so aptly expressed in quotation from Wordsworth which is the motto of journal *Nature*: "To the solid ground of nature sts the mind that builds for aye."

. . . The ordinary citizen sees little connexion between advance of science and the fact that he is healthy; it is, feels, a quality that other people may lack, but is his right of a superior heredity or habit. Ill health, on the ıer hand, while a fault in other people, is a misfortune himself and a serious reflexion on the state of medical ence."—Sir Henry Tizard. *Nature*, Sept. 11, 1948, p. 396.

STREPTOMYCIN IN NON-TUBERCULOUS INFECTIONS

SUMMARY OF A REPORT TO THE MEDICAL RESEARCH COUNCIL

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In December, 1946, the Medical Research Council appointed a committee[*] to arrange clinical trials of streptomycin in non-tuberculous infections, in parallel with the trials in certain forms of tuberculosis which have been organised by another committee of the council. The trials in non-tuberculous infections began at five centres in London and later were extended to eleven centres throughout the country. This report summarises the pooled results of the investigation; more detailed results will be published by individual observers.

Because of the small amounts of streptomycin available, the relative rarity of suitable cases, and the wide diversity of conditions treated, experience of most infections in which streptomycin therapy may be effective is still limited. Even when, as in *Hæmophilus influenzæ* meningitis, a reasonably large series has been studied, the distribution of cases over a large number of centres has led to unavoidable variations in case selection, therapeutic procedure, and bacteriological control. For these reasons present claims must be guarded. Nevertheless, some clear-cut results have been obtained and profitable lines for further inquiry have been indicated.

These trials have been restricted to infections resistant to other forms of therapy, in which bacteriological control of treatment has been possible. With few exceptions the infecting organism has been proved streptomycin-sensitive before treatment has been begun; occasionally—e.g., in infective endocarditis—when penicillin treatment has failed, subsequent attempts to isolate the organisms have been unsuccessful.

The chief value of streptomycin (apart from tuberculosis) lies in the treatment of penicillin-resistant infections due to the gram-negative bacilli, particularly *H. influenzæ*, *Proteus*, *Ps. pyocyanea*, and *Bacterium coli*. The clinical disorders in which treatment has been most effective are septicæmias, meningitis, urinary-tract infections, and local (superficial) infections.

H. INFLUENZÆ MENINGITIS

The results of preliminary trials in the United States suggested that streptomycin might be particularly valuable in this condition; a standard scheme of treatment was therefore recommended in the present investigation.

Dosage.—The intramuscular dosage was 20 mg. per lb. of body-weight daily in divided (four-hourly) doses; and the intrathecal dosage (in saline) was 50–100 mg. as the initial dose, according to age, and 25–50 mg. on subsequent days. Treatment was continued for at least seven days after the cerebrospinal fluid (C.S.F.) became sterile.

Results.—Streptomycin was given in 43 cases, of which 4 received in addition sulphonamides, penicillin, or serum; in 5 others the C.S.F. was reported sterile before streptomycin injections were started. Of the remaining 34 cases, the infection was controlled in 25 (74%) and treatment failed in 9. There was no significant difference in age, duration, or C.S.F. changes between the two groups, but clinically the unsuccessful cases appeared to be more the food and drink, and collect, measure, and analyse the urine, of our group of rabbits. It could be only by practical experience of this sort that one could solve satisfactorily the problem of total recovery of urine from the male rabbit, an animal endowed with a "stream" like a fire hose.

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[*] Sir Alexander Fleming (chairman), Prof. Ronald V. Christie, Prof. L. P. Garrod, Mr. R. Vaughan Hudson, Prof. H. Raistrick, Dr. Robert Cruickshank, Dr. F. C. O. Valentine, Dr. F. R. Selbie, and Prof. Clifford Wilson (secretary).

In advocating the educative value of a practical training in the intimate details of research I must not be taken as minimising the value, indeed the absolute necessity, of an adequate number of research technicians in the elaborate research projects which the solution of many problems demands. It is, however, essential that members of such research teams have a background of practical experience without which supervision of the work of the technicians is impossible.

For many trainee specialists a suitable investigative exercise will consist of an analysis of some grouping of case-records with a view to evaluating some suspected ætiological factor, the significance of a symptom or sign, the result of a certain therapeutic measure, or the illumination of the natural history of a disease process. Such an essay can be particularly valuable, since the discipline acquired is such as can be applied in later life, such research being specially suitable for the busy clinician who can only snatch an hour here and there. To be of value, though, it has to be well done, for a great deal of harm has resulted from the uncritical assembly of information selected by biased methods from fundamentally inaccurate records. It is particularly in this type of investigation that testing statistically and thinking quantitatively is so essential.

A clinical department proposing to provide research of this type requires a considerable accumulation of full and accurate case-records supported by relevant radiographs, histological preparations, and tissue blocks. At present there are relatively few units, even among the teaching hospitals, in which the case-records are of any value for this purpose. It needs careful planning and constant supervision by senior members of staff to ensure an adequate standard of records. In addition a hospital or group of hospitals requires a statistical department which will, in collaboration with the clinicians, ensure uniformity of practice and the codifying of information by modern methods which will ensure speedy and semi-automatic access to any desired group of cases. At the same time such statistical departments can never compensate for faulty original observation; the quality of the records is utterly dependent on conscientious and careful work in the consulting-room, ward, and laboratory. If I had to name the aspect of clinical work which should come first in a programme of reform, I would unhesitatingly select the preparation and preservation of case-records. Whatever be the merits and demerits of the National Health Service, the prospect it holds of nation-wide individual health-records meets with universal approval.

REPORTS ON RESEARCH

Whether the trainee be destined for a career in academic medicine or in the practice of a clinical specialty, the preparation of a report on his research problem is an important item in his education. In a small minority of instances this will be of sufficiently high standard to merit submission for publication. It is futile to expect that many will reach this standard; it must be evident from a perusal of current medical literature that a considerable proportion of the material that appears in print shows little evidence of scientific method and contributes little if anything to the sum total of knowledge. It is certain that the development of systematic training in investigative methods will greatly raise the standard of medical literature and will lighten the labours of editorial boards. A substantial proportion of these reports will be suitable for submission for the higher degrees of M.D. and M.S. Universities are showing an increasing tendency to award these degrees on the of evidence of having done original research or applied the scientific method to a problem in or surgery, using these terms to embrace virtually whole field of human biology. Interpreted in this these qualifications cease to be repetitions of the bership and fellowship and become tests of different attributes.

Most people have much to learn in the of such reports. It is extraordinary how the tendency to confuse quantity with quality think that any paper or thesis must be lengthy good. Economy of words, both spoken and just as important as the economy of material the slogan "Time is money" is as true in the and the laboratory as in the factory and I urge students to write papers as if they were cabling a story at a shilling a word. The report begin with a concise enunciation of the problem, should then give the design of experiment in detail to make it possible for others to repeat the An account of the results should be followed by cussion of the conclusions in the light of relevant work. Illustrations must be clear and to the Quantitative data require tabulation, and correlation should be used whenever possible. of data, though often better relegated to an must be sufficiently full to enable others to fully or refute the deductions made by the author. must be accurately listed, and abbreviations follow those of the *World List of Scientific* Some years ago the *Journal of Physiology* issued useful pamphlet entitled "*Suggestions to* which is still in print and can be obtained editor, at the Physiology Laboratory, consulted in the journal.

An essential attribute of those charged encouragement and direction of research is enthusiasm; *a cold hypercritical destructive* with the immature efforts of students inevitably the work of any educational organisation. criticism there must be, but the student who difficulties—and good students and promising gators are always in difficulties—needs and must be made to feel that his failures are and indeed desirable steps to success. Emerson right when he said that "Nothing great was ever without enthusiasm."

FUNDAMENTAL RESEARCH

It is hard to discuss the subject of research touching on the question of fundamental as applied investigation. Some use these terms as if had a precise meaning and were a basis for classification. In so far as all good science interpret phenomena in terms of first follows that all good research is fundamental of the problem; *the question of* whether the is immediately applicable to some circumstance environment becomes a secondary consideration. I *that a common basis for the use of these terms,* mutually exclusive sense, *implies* "*fundamental*" such as to have no practical use. This is an and artificial differentiation and can be avoided closest possible coöperation between clinicians laboratory workers; such a collaboration maximum when these activities are combined in and the same person. There must be *moments* in life of all clinical investigators when the desire to with single-minded devotion a particular research ders some intolerance of the *responsibilities* of care of patients and teaching, but a brief pause reflection brings a realisation that, without the of close contact with *individual* problems of health preliminary report in 1946 from this department on use of intrathecal streptomycin in meningitis was)pointing (Cairns et al. 1946); severe toxic reactions observed, and in only 1 of the 5 cases due to gram-tive organisms did the patient recover. It was ficant, however, that the solitary survivor was the patient to receive treatment early in the infection to achromobacter). All of the 3 patients infected Ps. pyocyanea died: in 2 treatment was begun when spinal block was already established and pus present in the cerebrospinal fluid (C.S.F.); the third ent died of respiratory failure shortly after the first tion of streptomycin.

nce that date we have treated 5 further patients, the results with purer supplies of streptomycin and ier treatment are more encouraging: 3 recovered infected with *Ps. pyocyanea* and 1 with *Bact. coli*); nfected with achromobacter) died; and 1 (infected 1 *Proteus*) did not respond to streptomycin but wered spontaneously.

f these 5 patients 4 received full doses of sulphondes during the streptomycin treatment. Though e cases of meningitis due to gram-negative organisms ond to sulphonamides, the rapidity of response to ptomycin treatment in the 3 successful cases leaves doubt about the effective agent, but a synergistic on is not excluded. The possibilities of successtreatment of a meningitis due to gram-positive gram-negative organisms with penicillin and ptomycin combined is illustrated by case 4.

DOSAGE

he accompanying table gives the details of the ses treated. In 3 the infection followed the surgical oval of a cerebral tumour or abscess, and in 2 a onic ear infection. Since supplies of streptomycin e short, treatment had to be confined to the intraeal or ventricular route; but undoubtedly this should combined with systemic streptomycin, particularly en there is an extracranial primary focus. A strength 10,000 units* per ml. in normal saline was used, 1 the usual dose was 50,000 units intrathecally daily 1 continued, when supplies were adequate, until the F. had been sterile for four or five days. In 2 cases intraventricular route was used as well, and in ase, which followed excision of a cerebellar abscess 1 developed a spinal block, streptomycin was injected ough the cerebellar decompression into a C.S.F. ulus. With this dosage the concentration of the drug naining in the C.S.F. twenty-four hours after the ection, though very variable, was usually well above e bacteriostatic level required for the particular ganism and often five times or more higher.

RESULTS

In 3 cases (2 of *Ps. pyocyanea* and 1 of *Bact. coli* eningitis) the results were very satisfactory, the ganisms disappearing from the C.S.F. after the first jection; this even obtained in 1 case of *Ps. pyocyanea* eningitis, where the patient had two relapses in three d a half months, the organisms disappearing each me after the injection of streptomycin. In 2 cases ere was no improvement: 1 (*Proteus*) due to lative insensitivity to streptomycin (25 units per l.) and probably insufficient treatment; and 1 chromobacter) which proved fatal owing to rapidly veloping resistance to streptomycin while receiving parently adequate dosage.

TOXICITY

With the doses used no toxic effects of any kind were served; nor was there any increase in the cell or protein content of the C.S.F. attributable to the streptomycin. The largest single dose injected into the lumbar theca and into the ventricle was 100,000 units.

BACTERIAL RESISTANCE

In the 2 cases which did not respond to treatment organisms were finally grown from the C.S.F. which were very resistant to high concentrations of streptomycin.

Case 1 (see table).—A man of 33 had a very chronic *Proteus* meningitis secondary to an ear infection which did not respond to large doses of sulphonamides, and on two occasions a short course of intrathecal streptomycin was given (100,000 units intrathecally daily for four days) without effect on the C.S.F. or on the clinical condition. It is unfortunate that the sensitivity of the organism to streptomycin was not tested before treatment. Two months after the second course the organism was sensitive only to streptomycin 50 units per ml. At this stage the patient began to improve slowly, and now, eight months after the onset, he is doing full work and is well, apart from mild daily headache; the C.S.F. contains only 4 cells (3 lymphocytes) per c.mm. and 40 mg. of protein per 100 ml., culture being sterile.

In this case it should be noted that neither of the two courses of streptomycin lasted longer than four days. The case illustrates that, unless treatment is effective and adequate at the beginning, the infecting organism may become resistant to all chemotherapy.

In the second case resistance to the drug rapidly developed under apparently adequate treatment.

Case 2 (see table).—A boy, aged 9 years, developed a postoperative achromobacter meningitis three days after removal of a medulloblastoma of the vermis. The organism was shown to be insensitive to penicillin but sensitive to streptomycin 10 units per ml. Treatment was begun with 50,000 units into the ventricle and 50,000 units intrathecally. Twenty-four hours later a concentration of 63 units per ml. remained in the C.S.F., and a further 75,000 units was injected. Despite this large dosage the organism was again grown from the C.S.F. next day and was now insensitive to 64 units per ml. Streptomycin 50,000 units was given daily for five days, and the drug was then stopped. During these days the C.S.F. was sterile, and the cell-count, previously 1700 per c.mm., fell to below 100 per c.mm., though the amount of protein remained high and the clinical condition was unchanged. Subsequently the organism was recovered repeatedly from the C.S.F., and the child died thirty-five days after onset of the infection. Eleven days after the beginning of streptomycin treatment the organism was insensitive to streptomycin 100 units per ml.

Whether resistance to streptomycin is acquired as a result of treatment or is a natural resistance of some of the organisms, the more sensitive ones being killed early, is not yet known, but the very rapid appearance of resistance, together with the favourable cell response in the C.S.F., with sterile cultures for several days in cases such as the one described above, suggests the latter explanation, the resistant organisms later multiplying and producing a fatal result.

RELAPSES

In this series the only case to relapse after apparently successful treatment was case 4. Here the reason was obvious and one which should be borne in mind when dealing with these infections—the presence of an inadequately treated primary focus.

Case 4 (see table).—A man, aged 51, had had a discharging left ear for twenty years. In March, 1946, he became acutely ill with symptoms suggesting a cerebellar infection. A radical mastoidectomy was performed, and later a cerebellar abscess was tapped through the mastoid wound. He slowly improved despite the formation of a cerebral fungus through the wound and two attacks of meningitis. In July he relapsed suddenly, and in August was transferred to the Radcliffe Infirmary.

On admission he had a large fungus presenting through the mastoid wound which was discharging pus from which *Staph. aureus* and *Ps. pyocyanea* were cultured. He was treated with intramuscular penicillin and daily dressings to the fungus, and this finally healed.

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* 1 unit = 1 μg. of streptomycin base.

severe. Where typing was carried out the organism was found to be Pittman type b. When treatment was successful the C.S.F. usually became sterile within twenty-four hours of the first intrathecal injection. Streptomycin was effective in 13 cases which had relapsed on other treatment, and in 9 cases in which the infection had been present for two weeks or longer; 4 patients relapsed after an initial response to streptomycin, but the organism remained sensitive and further treatment with streptomycin alone was successful. The principal cause of failure was the development of resistance by the organism; this occurred in 7 of the 9 failures, sensitivity changing from 0·5 to as high as 5000 units in 1–4 days.

From this series it appears that in *H. influenzæ* meningitis streptomycin alone is probably as effective as any other form of treatment at present available. The development of resistance is, however, a serious drawback, and it has been decided to use in future trials a combination of streptomycin, penicillin, and sulphonamides from the start.

OTHER FORMS OF MENINGITIS

Streptomycin was given in 14 cases of meningitis due to penicillin-resistant bacteria. The causal organisms included *Bact. coli*, *Ps. pyocyanea*, *Staphylococcus pyogenes*, *Proteus*, and *Streptococcus fæcalis*. In the majority of cases the meningitis developed after operation for cerebral abscess or cerebral tumour. The infection was controlled in 11 instances. Streptomycin is therefore a valuable new therapeutic agent in pyogenic meningitis due to penicillin-resistant organisms.

SEPTICÆMIAS

Streptomycin was given in 5 cases of subacute bacterial endocarditis due to *Strep. viridans* or to *H. influenzæ*, and in 1 case of uncertain nature. Except in the last-named case, the response to streptomycin has been only temporary; 2 cases of septicæmia without endocarditis, due to *Ps. pyocyanea* or to *Bact. coli*, have responded satisfactorily.

URINARY-TRACT INFECTIONS

A series of 61 patients with urinary-tract infection due to *Bact. coli*, *Ps. pyocyanea*, *Proteus*, *Staph. pyogenes*, or *Strep. fæcalis* was investigated in ten centres. In roughly half the cases the infection has been controlled by intramuscular administration of 3 g. streptomycin daily for 1–3 days. Failure was almost always due to the development of resistance. Like other antibacterial agents, streptomycin has a limited value where there is some underlying condition which is liable to lead to recrudescence of the infection.

LOCAL SEPSIS

Streptomycin was given to 55 patients with local infections, including a wide variety of lesions such as infected burns, operation wounds, superficial ulcers, sinuses, abscess cavities, and septic skin conditions. The bacterial causes were similar to those detailed in the preceding paragraph. Daily applications of a saline solution of streptomycin (2 mg. per ml.) have been used either alone or combined with intramuscular therapy. The results are favourable, particularly in superficial lesions, provided that all necrotic tissue is removed. A standard technique is essential. Streptomycin has been used effectively as a cover for skin-grafting. In a proportion of cases failure has been attributable to the development of resistance.

RESPIRATORY INFECTIONS

Chronic lung infections due to bronchiectasis and lung abscess (14 cases) have been treated by inhalation and intramuscular injection. Though a temporary reduction in the bacterial content of the sputum has been noted the cases showed little if any clinical improvement. The results of a preliminary trial in cough were inconclusive. More experience is of *acute* lung infections due to penicillin-organisms.

INTESTINAL-TRACT INFECTIONS

Streptomycin 2–4 g. spread over seven days has given by mouth in 42 cases of infantile
Sensitive organisms rapidly disappear from the
As the infecting agent in this condition is not
the same, it was to be expected that the results
in different centres would vary. Some centres
clinical benefit, but so far treatment has not
sufficiently controlled to warrant any definite
Further trials, in which streptomycin will be
alternate cases, are being undertaken. A small n
of cases of ulcerative colitis and of typhoid fever
been treated by oral and intramuscular adm
with negative results.

SUMMARY

In this series of cases streptomycin has often
successful in controlling:

(1) Meningitis: *H. influenzæ*, *Bact. coli*, *Ps.* *Proteus*, and *Staph. pyogenes*.
(2) Septicæmia: *Bact. coli* and *Ps. pyocyanea*.
(3) Urinary infection: *Bact. coli*, *Proteus*, *Ps. pyo* *Strep. fæcalis* and *Staph. pyogenes*.
(4) Local sepsis: *Bact. coli*, *Proteus*, *Ps. pyocyanea*, *pyogenes*, and *Strep. hæmolyticus*.

There have, however, been examples of almost
type of infection in which the micro-organisms
became resistant. Courses of treatment should th
be planned to exert the greatest possible influenc
the beginning. The effect of combining strep
with other agents, such as the sulphonamides, is
investigation.

Owing to the short periods of administration
symptoms have been unusual and of slight imp
Urticarial rashes and skin irritation at the site of
application have occasionally been noted.

STREPTOMYCIN TREATMENT OF MENINGITIS DUE TO GRAM-NEGA SAPROPHYTES

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MENINGITIS due to saprophytic gram-negative
isms such as *Ps. pyocyanea*, *Proteus*, and co
bacteria is uncommon but carries a high mortal
These organisms are relatively or absolutely insensiti
to penicillin; and the response to sulphonamide thera
is often unsatisfactory.

Infection usually arises as a complication of spi
analgesia (Evans 1945, Kremer 1945, Vuylsteke 19
Davidson 1947), neurosurgical operations, or the int
thecal injection of penicillin (Botterell and Magner 194
In wounds of the head and of the spine penicillin h
been so effective in combating infections due to gra
positive organisms that the pathogenicity of th
gram-negative organisms, when introduced into t
subarachnoid space, has become more apparent. The
Lewin (1948) showed that nearly a quarter of the ca
of meningitis following penetrating head wounds in t
latter phases of the late war, when penicillin was fre
available, were due to these organisms. Besides pe
trating wounds of the head and spine and operation
a chronic infection of the ear may cause a meningit
in which these gram-negative organisms are wholly
partly responsible. Coliform meningitis occurs in infant
sometimes with a recognisable focus elsewhere in th
body, but it is very rare in adults.

since collections of purulent exudate and debris
revent free diffusion of antibiotics. These were
bly the main factors in the failure of streptomycin
'e the 2 cases of *Ps. pyocyanea* meningitis reported
usly (Cairns et al. 1946). For these reasons
early treatment before pus forms is a vital factor
cessful treatment.

point was emphasised recently in the treatment of
operative infection beneath the scalp flap of a patient
n old gunshot wound of the head. A small abscess
beneath the scalp contained about 10 ml. of pus,
grew a penicillin-sensitive hæmolytic streptococcus
resistant *Staph. aureus.* The streptococcus quickly
eared with local instillation of penicillin, but the
aureus remained and was resistant to penicillin 65 units
l. but sensitive to streptomycin 1·25 units per ml.
the next five days a total of 260,000 units of strepto-
was injected into the cavity. At the end of this time
uld still be aspirated which was very acid in reaction,
aureus was still present, and the sensitivity to strepto-
was unchanged. The local concentration of strepto-
must have been many times the bacteriostatic level,
here was absolutely no response. The pus was
uently drained with rapid subsidence of the infection.

e appearance of resistant strains of the organism is
er important factor in deciding the success or
e of streptomycin therapy, and it is most important
sure that the initial doses are sufficiently large.
ver, though the doses used here give an adequate
ntration in the C.S.F. over twenty-four hours for
very sensitive organisms, there are often well-
ed differences in streptomycin levels in the C.S.F.
y-four hours after injection in the same patient.
one patient after 100,000 units given intrathecally
ed a concentration of 25 units per ml. remaining
e C.S.F. twenty-four hours later; yet a similar
next day gave only 8 units per ml. after twenty-
hours. It is therefore essential not only to
the sensitivity of the organism before beginning
ment, so as to ensure an adequate initial dosage,
also to check C.S.F.-streptomycin levels during
ment.

tunately these infections, though severe, are usually
lminating, and in the present state of our knowledge
wise, where possible, to begin treatment with
adiazine and defer streptomycin treatment until
ensitivity of the organism has been tested in vitro.
adiazine is effective in some cases. With an
ism sensitive to concentrations up to 10 units
nl., streptomycin should be injected intrathecally
in doses of 50,000–100,000 units and continued
the C.S.F. has been sterile for at least five days.
n the causal organism is relatively insensitive,
er C.S.F.-streptomycin levels can be obtained by
thecal injections twice or thrice daily. When
lies are available, systemic streptomycin should also
iven not only to deal with other foci of infection
also because streptomycin passes the blood-C.S.F.
ier in appreciable quantities, particularly in acute
ngitis.

ck of response to streptomycin treatment in a
ngitis due to a sensitive gram-negative organism
be due to (1) inadequate dosage, (2) developing
tance (or resistant strains) of the organism, (3) an
eated primary focus, or (4) pus formation.

wish to thank Sir Hugh Cairns for his advice in
reparation of this paper.

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STREPTOMYCIN IN PULMONARY TUBERCULOSIS

REPORT ON TEN CASES

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THE value of streptomycin in the treatment of meningeal and miliary tuberculosis having been established, its properties in other forms of tuberculosis are now being explored. Such reports as have appeared, mainly in America, suggest that streptomycin may have an almost specific effect on tracheobronchial tuberculosis (Brewer and Bogen 1947, Canada 1947, Parnal et al. 1947), and a beneficial effect on laryngeal tuberculosis (Black and Bogen 1947, Shamaskin et al. 1947) and intestinal tuberculosis (Sweany 1947), while Hinshaw et al. (1946) reported encouraging results in the treatment of draining sinuses of tuberculous origin. The results in purely pulmonary lesions are much less definite, but at least temporary improvement has apparently followed its use in some cases of predominantly exudative disease (Shamaskin et al. 1947, Cassidy and Dunner 1947, Allison and Nilsson 1947).

Opportunities for the clinical study of streptomycin in Britain have so far been limited, but as supplies are likely to increase in the near future an account of a very small series of cases treated during the first half of 1948 may be of interest.

Through the generosity of the American Red Cross a consignment of 600 g. of streptomycin was presented to the Scottish Red Cross Sanatorium at Tor-na-Dee early this year. The selection of suitable cases for treatment required much thought, for this generous gift had to be utilised to the greatest advantage. The cases selected were (1) a severe tracheobronchial tuberculosis, (2) a tuberculous chest-wall sinus persisting after a thoracoplasty for tuberculous empyema, (3) two cases of acute exudative pulmonary tuberculosis, and (4) a small contralateral spread of disease following thoracoplasty. The remaining streptomycin was used as a cover during the stages of thoracoplasty operations in cases in which there seemed to be an appreciable risk of extension of the disease.

Dosage.—All cases received 1 g. of streptomycin in the twenty-four hours, given in two doses of 0·5 g. at 8 A.M. and 8 P.M. Administration was by intramuscular injection and no local application of the drug was tried.

CASE-RECORDS

Case 1.—A man, aged 43, was admitted in November, 1946, with a year's history of cough, sputum, and loss of weight. His sputum was T.B.-positive and a radiogram of his chest showed infiltration in the upper and mid zones of the left lung, with tomographic evidence of cavitation. "Roof-tiling" of the ribs over the affected area, with deviation of the trachea to the left, suggested a widely adherent apex and was accepted as a contra-indication to artificial pneumothorax. Left upper thoracoplasty was considered to be the treatment of choice. Four weeks after admission, however, there was radiological evidence of extension of the disease in the left lung, with the formation of a new cavity in the mid zone, this being rapidly followed by a further spread of the disease to the lower zone. This was accompanied by increased cough and sputum and a deterioration in the patient's general condition. Brief febrile bouts occurred, associated with a complete cessation of sputum. Major surgery was contra-indicated meantime, and a left phrenic crush, supplemented by pneumoperitoneum, was carried out. Some benefit ensued and the X-ray appearance improved, with gradual clearing of the fresh infiltration in the lower lung field. This benefit was only temporary; the cough increased in severity, developing a harsh brassy note, febrile episodes with sputum retention

In October the cerebellar abscess was excised. After this excision the patient had a recurrence of the meningitis. *Staph. aureus* and *Ps. pyocyanea* were grown from the C.S.F. He improved on intrathecal and systemic penicillin and, later, sulphadiazine by mouth; but after eleven days he relapsed, both organisms were grown from the C.S.F., and a spinal block developed. Local penicillin was now given into the C.S.F. loculus which had formed beneath the cerebellar decompression, and from this site also both organisms were obtained. With this treatment the *Staph. aureus* disappeared but *Ps. pyocyanea* remained in pure culture. Streptomycin 20,000 units was now injected daily for two days, at the end of which the loculus had completely subsided.

A fortnight later the patient's temperature rose sharply to 102°F, the loculus reappeared, and once more turbid C.S.F. containing both organisms was withdrawn. After two injections of penicillin 10,000 units the *Staph. aureus* disappeared, and at this stage streptomycin 40,000 units was injected as well. All subsequent cultures were sterile, and for the next seven days penicillin 60,000 units and streptomycin 80,000 units were given daily through the loculus, which steadily diminished in size. After four days of this treatment the patient's temperature settled to normal for the first time since his operation, and he began to improve. He made a steady convalescence over the next three months and was finally discharged from hospital afebrile; the cerebellar decompression was soft, but the spinal block was still present.

He relapsed, for the third time after the excision of his abscess, a fortnight after discharge from hospital, and this time *Ps. pyocyanea* and *Strep. viridans* were grown from the loculus, which had reappeared. Once more combined therapy was successful. *Ps. pyocyanea* disappeared after the first injection of streptomycin 50,000 units, and *Strep. viridans* after the fourth instillation of penicillin. Systemic and sulphadiazine were also given. In view of this Mr. G. Livingstone was consulted, who advised ro of the mastoid. This was done while the patient was on combined therapy daily. At operation a petrositis present, and the cochlea was found to be filled with Infection had been reaching the C.S.F. via the This operation did not cause the meningeal infection to up, and the patient made a steady convalescence, streptomycin being continued this time for twenty-one and penicillin for six days. The spinal block

The patient was seen again nine months later, w ear was dry and there had been no recurrence of the

The *Ps. pyocyanea* in this instance remained sensitive to streptomycin despite the use of strep on two previous occasions. This supports the streptomycin resistance is more likely to be than acquired.

COMMENT

The results in these few cases suggest that st will be of value in treating meningitis due to gram-negative organisms. Undoubtedly the dif between these results and those of two years ago is to purer streptomycin and earlier institution of tre before frank pus or spinal block has developed. activity of streptomycin is seriously impaired in presence of pus. As Abraham and Duthie (1946) shown, this is primarily due to the associated of the pH of the medium. In addition, if the has reached the stage of pus formation, it impossible to obtain an adequate concentratio streptomycin throughout the cerebrospinal fluid

DETAILS OF TREATMENT WITH STREPTOMYCIN IN 5 CASES

Case no.	Age (yr.)	Source of infection	Bacteriology	Duration of meningitis before streptomycin treatment (days)	White cells per c.mm. in C.S.F. at height of infection	Streptomycin details: Route	Largest single dose (units)	Total dosage (units)	Sterile C.S.F. obtained	Initial sensitivity of organism (units per ml.)	Concentration in C.S.F. after 24 hr. (units per ml.)	Resistance to streptomycin	Ancillary treatment	I
1	33	Left ear	*Proteus*	42	1400	L	100,000	700,000	Sterile during treatment but organisms grown later	..	8–25	Sens. to 50 u/ml. 2 months later	Sulphadiazine	Ur
2	9	Post-operative after removal of cerebellar tumour	Achromobacter	6	8500	L & V	50,000	425,000	Not obtained	10	15–63	Resistant to 64 u./ml. by 2nd day and to 100 u./ml. on 11th day	'Sulphamezathine'	I
3	41	Post-operative after removal of cerebral abscess	*Ps. pyocyanea*	3	1650	L & V	100,000	350,000	After 24 hr.	4	8–100	..	Sulphamezathine, intramuscular penicillin (not during streptomycin therapy)	Re
4	51	Left ear (*a*)	*Ps. pyocyanea* *Staph. aureus*	25	800	Into C.S.F. loculus	80,000	640,000	After 24 hr.	..	20–40	..	Sulphadiazine, intramuscular and intrathecal penicillin	Re bu 1a 3 n lat
		(*b*)	*Ps. pyocyanea* *Strep. viridans*	5	1000	Into C.S.F. loculus	50,000	1,000,000	After 24 hr.	..	20–40	..	Sulphadiazine, intramuscular and intrathecal penicillin	Re
5	4	Post-operative after removal of cerebellar tumour	*Bact. coli*	1	3500	L & V	75,000	450,000	After 24 hr.	3	5–20	..	Sulphadiazine, intramuscular penicillin	Re

1 unit = 1 µg. of streptomycin base. L = lumbar theca. V = ventricle.

ais time a total of 66 g of streptomycin had been given. pneumoperitoneum had been maintained gently through-put no attempt had been made to achieve maximum tion, owing to the severity of the patient's illness and ifficulty of fluoroscopic control.

he time of writing his progress has been well maintained; nperature is now normal and it seems possible that he t become a candidate for further collapse therapy, with ospect of securing eventual control over the disease.

e 6.—A man, aged 24, had a left upper thoracoplasty d out in the sanatorium in March, 1948, to deal with a extensive area of infiltration involving the upper third left lung, where there was tomographic evidence of tion. Artificial pneumothorax was not possible because previous left pleural effusion of some severity. After cond stage of the operation a small area of infiltration red in the upper zone of the right lung, which had usly been clear. The appearance of this infiltration ded with a rise in the E.S.R. to 20 mm. in one hour.

ourse of streptomycin was begun immediately, and a later, when a total of 30 g. had been given, the lesion right lung had cleared completely and the E.S R. had ved to 1 mm.

patient has since gone ahead steadily; he is now up bout for several hours daily and should be ready for rge in about 2 months' time.

ses 7, 8, 9, and 10.—The balance of our supply of omycin was used to provide cover during the stages of coplasty in four cases in which there was thought to be usual risk of complications. In two of these there was ge to the lung base as a result of previous pleural effu-while the remaining two had impaired diaphragmatic ion owing to a delayed recovery of movement following ic-crush operations. Streptomycin was given in a e of 1 g. daily for 96 hours before and after each stage e operation. All four cases pursued a smooth and nplicated course throughout.

complications or *side-effects* which could be attri- to the streptomycin were noted in any of the cases.

DISCUSSION

report on a small series of diverse cases such as these be regarded as of interest rather than of value, but ay help in suggesting the type of case which is to derive most benefit from this antibiotic.

e response of the bronchial disease, the chest-wall , and the laryngeal lesion was prompt and unmis-ble, as one would have anticipated from the rican reports already cited, and this suggests that tomycin will find its greatest sphere of usefulness in management of the extrapulmonary sequelæ of rculosis.

se 4, an active pulmonary lesion of exudative type, very disappointing. American experience had sug-ed that some benefit might have been expected in a case, and one had hoped that, by using strepto-cin to control the exudative phase, the patient might e been fit for thoracoplasty fairly soon. As it is, course of the illness has not been shortened in way.

he case of tuberculous pneumonia (case 5), on the r hand, did appear to benefit appreciably and con-ned to the experience of Allison (1947) in that the r and constitutional symptoms subsided early, while ological improvement was delayed for some weeks.

he part played by the streptomycin in case 6 and the four thoracoplasty cases in which it was used phylactically is impossible to assess. The small ralateral lesion in case 6 might well have resolved ntaneously.

CONCLUSIONS

he decision to use streptomycin in any case of monary tuberculosis should be taken only after most eful consideration. The benefit to the patient is by means certain, and this possible benefit must be ghed against the danger of producing a streptomycin-stant strain of bacilli in a particular case and thus creating a future public-health problem. On the available evidence there appear to be very few purely pulmonary cases in which the use of streptomycin could be advised.

This very limited experience with streptomycin suggests that it may have a definite value in the treatment of the extrapulmonary complications of pulmonary tuberculosis.

Its use in tuberculous pneumonia, to prepare the way for effective collapse therapy, is probably justified in view of the high mortality associated with this form of the disease.

My thanks are due to the American Red Cross, whose generous gift of streptomycin made the treatment of these cases possible, and to Mr. F. J. S. Gowar, F.R.C.S., and Mr. E. G. Collins, F.R.C.S., for carrying out the bronchoscopic and laryngeal examinations.

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THE EOSINOPHIL CELL

STUDIES IN HORSE AND CAMEL

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WHILE investigating the secretion of red blood-cells by eosinophils I was interested to learn that the eosinophils of the horse contained granules resembling small red blood-cells (Dr. Leandre Cervera, personal communication). Arrangements were therefore made for a thorough study of the blood and other tissues of the horse, and from this it was found that the granules of the eosinophils in the peripheral blood were far larger than those found in various other mammals, including man. The granules varied in size from cell to cell, some of them being as large as a small red blood-cell (fig. 1). On micro-incineration the granules left ashes behind, as happens with the granules in man. A study of the gastric and intestinal mucosa of the horse showed that, as in the other herbivora, the eosinophils arose from those organs where the red blood-cells appeared to be secreted in situ (fig. 2), a phenomenon similar to that described for the abomasum of different hervibora (Duran-Jorda 1945). In the spleen of the horse were very many eosinophils, in some of which the granules were as large as small red blood-cells.

In spite of my being able to show objectively the secretion of the red blood-cells by the eosinophils in

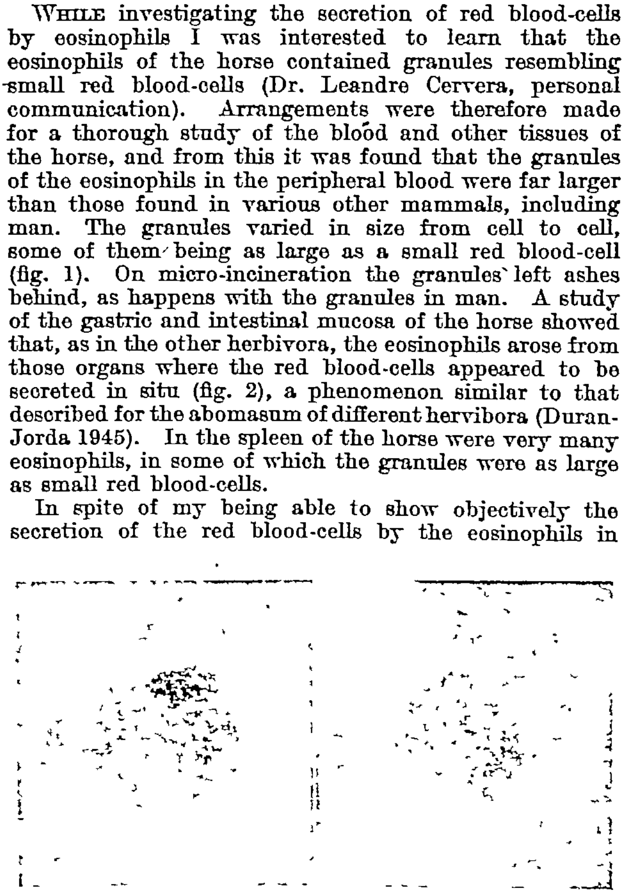

Fig. 1—Horse's blood showing granules of different sizes, some like small red blood-cells, in eosinophils.

recurred, and the cavitation in the left upper and mid zones became increasingly obvious. The whole clinical picture now suggested tracheobronchial tuberculosis, which was confirmed by bronchoscopic examination in June, 1947, when extensive ulceration of the left main bronchus was seen.

It was now a question of marking time until streptomycin became available, and the status quo was maintained with some difficulty until April, 1948, when the American supply was received. On April 13 a further bronchoscopy was carried out, when œdema of the carina was noted, with ulceration on the left side. Granulations were present in the left main bronchus almost to the level of the carina.

A course of streptomycin was begun on April 16. Within a fortnight there was a well-marked improvement in symptoms, the severity of the cough had diminished, sputum was decreasing, and the patient's general condition was improving rapidly. Bronchoscopy on May 14 showed a remarkable clearing of the bronchial lesions, with healing of the ulcerated areas. The improvement was so dramatic that it was decided to proceed with the thoracoplasty operation, and the first stage was carried out on May 25, the second and third following on June 8 and 29. There were no postoperative complications. Bronchoscopy on July 8 showed some hyperæmia of the left main bronchus, with few granulations. Streptomycin was stopped on July 24, when 100 g. had been given.

The patient has continued to improve in all respects; sputum is diminishing steadily in amount and is now T.B.-negative on direct examination, and X-ray examination shows a satisfactory collapse of the left lung following the thoracoplasty.

Case 2.—A man, aged 25, was admitted in February, 1947, with a limited lesion in the right upper zone, where a small cavity was visible behind the clavicle. A right artificial pneumothorax was begun shortly after admission and adhesion section was carried out some 5 weeks later. Immediately after the adhesion section the patient developed a very acute pleural effusion, with high fever and much constitutional disturbance. Attempts to secure pulmonary re-expansion were defeated by very rapid pleural thickening: the fluid became turbid, contained many lymphocytes, and was T.B.-positive on guineapig inoculation. Intensive aspiration was continued until November, 1947, by which time the patient's general condition had sufficiently improved to permit obliteration of the pleural space by thoracoplasty, and the operation was accordingly done in December, 1947. There was a stormy convalescence which caused considerable anxiety and subsequent progress was slow, but X-ray examination indicated that the desired obliteration of the infected pleural cavity had been secured. A sinus, however, formed at the lower end of the operation scar and continued to discharge over a period of weeks. Bacteriological examination of this discharge showed tubercle bacilli, and typical tuberculous tissue was demonstrated in a biopsy specimen from the sinus wall. The sinus itself was about 5 in. long and showed no tendency to heal.

A course of streptomycin was begun on April 20, 1948, and 14 days later a definite improvement was noted in the sinus, which appeared to be closing. This was confirmed by injection of iodised oil. Subsequent progress was steady and uninterrupted, final healing being recorded on June 2. The streptomycin was continued until June 18, when a total of 60 g. had been given.

The patient was discharged from the sanatorium on July 20 in excellent general condition, free from all chest symptoms, and with the tuberculous sinus firmly healed.

Case 3.—A man, aged 27, arrived at the sanatorium in October, 1946. His general condition was extremely poor, he was grossly anæmic, and X-ray examination showed extensive infiltration involving the upper halves of both lungs but without any notable degree of cavitation. The larynx was severely involved, with gross œdema and infiltration of the epiglottis and arytenoids. He complained also of severe diarrhœa, and barium examination showed an advanced colitis which was accepted as tuberculous. The prognosis was regarded as very bad and the patient was kept on strict bed-rest and voice rest for many months. The anæmia proved so intractable as to raise the question of a tuberculous infection of the bone-marrow, but this could not be confirmed by sternal puncture, and eventually a response was obtained to a series of small blood-transfusions. The intestinal lesion responded also to intensive treatment with intravenous calcium gluconate and a high-vitamin diet, and by May, 1947, the alimentary function was completely normal and the patient was gaining weight. Meantime the pulmonary was showing evidence of healing, but the situatio larynx was thoroughly unsatisfactory, there being now tion of the epiglottis with involvement of both vocal A course of calciferol was given, which for a time p some improvement but which had to be terminated ev owing to symptoms of intolerance. The laryngeal then remained static for some months but began to de again in February, 1948. Meantime the pulmonary had steadily improved, the sputum was T.B.-negati the patient's general condition was reasonably good.

The retrogression of the laryngeal condition promp use of streptomycin, which was begun on April 20, From that time onwards there was steady improv Swelling and œdema subsided, the lesions of the vocal cleared rapidly, and by the beginning of July he practically complete, apart from two small ulcerated the epiglottis which were dealt with by the electr By July 23 a total of 90 g. of streptomycin had been and the course was terminated.

The patient was discharged from the sanatorium in final X-ray examination having shown complete hard the infiltration in both lungs, while what little remained was T.B.-negative both on concentration culture.

Case 4.—A man, aged 26, was admitted on Jan. 14 with a history of an acute febrile illness 8 weeks pre An X-ray film of his chest at that time had shown of exudative disease in the right upper and mid zo admission his general condition was rather poor, mildly febrile, and his sputum, although very lim amount, was T.B.-positive. An X-ray film of his suggested that there had been some clearing of the infil on comparison with the film taken at the outset of the i After a month's bed-rest, however, there was evid extension of the disease, accompanied by a sharp rise erythrocyte-sedimentation rate (E.S.R.) from 5 mm. to in one hour. A right phrenic crush and pneumope were carried out, but only a very moderate elevation diaphragm resulted, because of adherence between the diaphragm in the posterior half. Four weeks later t been no improvement, the patient was still febrile tending to lose weight, and the exudative lesion in lung was gradually extending.

A course of streptomycin was begun on April 20 continued until July 28, a total of 100 g. being given. was no evidence of any benefit from the treatmen patient remained mildly febrile throughout, he lost weight, and comparison of radiograms at the begin end of the course showed that, if anything, there h some extension of the infiltration during the period.

Case 5.—A man, aged 22, was admitted on May 17 His admission was regarded as an emergency and was at the special request of a Service hospital where the had arrived gravely ill with acute pneumonic tube His transfer to the sanatorium was effected by air amb and he was so seriously ill on arrival that only the of investigation was possible. He was taken straight the ambulance to the X-ray department, where a film chest was obtained as he lay on the stretcher. He a desperately ill, with high fever up to 105°F each ev heavy sweating, and a severe and racking cough acco by abundant purulent sputum which contained very n tubercle bacilli. His X-ray film showed extensive ex disease in the upper half of the right lung, with ragged of cavitation. The lower three-fifths of the left lun consolidated throughout.

Treatment with streptomycin was begun immediatel a few days later a left phrenic paralysis and pneumoperit were added, because the situation seemed so desperat every possible aid must be utilised. During the succ fortnight there was little change. The temperature re high and the racking cough continued, but there further deterioration in his condition, in contrast to the before admission. Then slowly the tide began to turn. temperature came down gradually to 101° and then to He began to gain weight, the cough improved, and the sp diminished. The radiological appearances, however, rem unaltered, despite the notable improvement in sympton general condition, until July 22, when for the first tin radiogram showed a moderate degree of clearing of the in tion in the right lung and of the consolidation in the

NINGO-ENCEPHALITIS IN MAN DUE TO THE LOUPING-ILL VIRUS

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UPING-ILL occurs naturally in sheep on hill farms rtain areas of Scotland and the border counties of and, where it is responsible for a considerable ality. Well known to farmers for over a century, it because of its economic importance, been the ect of much discussion and investigation, culminating 30–32 in a series of reports in which its nature and e of transmission were finally established. Pool L (1930), in successful experimental transmission, ed that louping-ill is due to a filter-passing virus, MacLeod and Gordon (1932) established that the p tick (*Ixodes ricinus*) is the natural vector. Further ies on its histopathology and transmission to other als were made by Hurst (1931), Brownlee and on (1932), Gordon et al. (1932), and Findlay and n (1933), from whose communications the following mation on louping-ill in animals is taken.

LOUPING-ILL IN SHEEP

rect infection from sheep to sheep does not occur; ction is conveyed by the tick, *Ixodes ricinus*, which its larval stage becomes infected by sucking the d of an infected sheep, and is itself infective in its phal and adult stages.

hen a sheep is bitten by an infected tick, there is lly an incubation period of one or two days followed a simple febrile reaction lasting three or four days. re is then a short afebrile period, after which the perature again rises and typical symptoms develop. sheep becomes dull and incoördinate, and there are cular tremors, especially of the head, with salivation champing of the jaws. Often the sheep makes leaping ements (hence the name "louping-ill"), and there may ataxia of cerebellar type. Within a period varying n a few hours to one or two days the sheep becomes ble to stand, and it lies, usually on one side, kicking orously. Paresis of one or more limbs may ensue, this stage is succeeded, usually in a few hours, by na and death.

Occasionally the sheep dies in the initial febrile period a septicæmic type of illness and without nervous ns. Other sheep develop only the initial febrile upset then recover completely, being thereafter immune inst further attacks. In examinations of sheep from ms where the disease was prevalent 20% were found be immune, presumably having survived an infection.

There is a second tick-borne infection of sheep, ick-borne fever," which is immunologically distinct m louping-ill, and it is stated that only when the ep already has tick-borne fever does infection with the ping-ill virus lead to the characteristic cerebral illness.

heep may be infected experimentally by inoculation the virus intracerebrally and by other routes. When erimental inoculation is successful, the disease as cribed above follows after an incubation period of or two days. Repeated passage of the virus from ep to sheep by intracerebral inoculation appears to ghten its virulence and shorten the incubation period.

At necropsy of sheep dying of either natural or experimental louping-ill there are no gross changes, but histological examination shows a general meningo-encephalo-myelitis, with varying degrees of damage to the Purkinje cells in the cerebellum and often severe damage to the nerve-cells in the medulla and spinal cord. No inclusion bodies can be seen. The virus can be recovered from the blood of experimentally infected sheep between the third and seventh days after inoculation; after death it can be recovered constantly from the brain, and often from other tissues.

LOUPING-ILL IN OTHER ANIMALS

Though the disease does not appear to occur naturally in other animals, many, including the pig, mouse, field vole and monkey, can be infected experimentally by intracerebral inoculation, and the mouse can be infected also by intranasal instillation. Full accounts of the clinical and pathological findings in the pig, mouse, and monkey are given in the communications already mentioned. Briefly, in all these animals infection leads to a meningo-encephalo-myelitis; the symptoms and the intensity and distribution of the histological changes vary from species to species. Inclusion bodies have been described in the mouse and the monkey.

LOUPING-ILL IN MAN

Rivers and Schwentker (1934) reported in detail illnesses suffered by 4 persons working with the louping-ill virus in the laboratory. Their sera were examined, after recovery, for virus neutralisation by a technique fully described by Rivers and Schwentker. All 4 sera neutralised the virus of louping-ill. Similar tests were made on 46 people with, or recovered from, various illnesses; in only 1 was there any virus neutralisation, and this was incomplete. In 10 other people who had possibly had contact with louping-ill virus these serological tests were negative. Finally, of the sera of 3 persons who had handled the virus but gave no history of illness, 1 neutralised the virus and 2 did not. From these results it was concluded that the test gave reliable evidence as to whether or not a person had been infected with the virus. Consideration of the circumstances under which the 4 people fell ill, and of the features common to their illnesses, led to the conclusion that these illnesses were due to infection with the virus of louping-ill.

Wiebel (1937) and Wesemeier (1938) each reported a further case in a laboratory worker, with serological confirmation of diagnosis, and in Wesemeier's case the result of the serological test was rendered more significant by the observation that a year previously a virus-neutralisation test on the patient's serum had been negative.

In one of the 6 patients the illness would have passed for influenza; in the remaining 5 it took the form of a meningo-encephalitis, and in 3 of these was biphasic, the meningo-encephalitic phase following an "influenzal" phase after several days' comparatively good health. The symptoms and findings included headache, prostration, fever, vomiting, drowsiness, insomnia, photophobia, diplopia, slow speech, vertigo, tremors, ataxia, neck stiffness, bradycardia, and papillœdema. All patients recovered completely in one to three months. The cerebrospinal fluid (C.S.F.) was examined in 4 of the 6 patients; in 1 it was normal, whereas in 3 the protein-level was raised and there was lymphocytosis. The 4 persons reported by Rivers and Schwentker were all engaged in performing intranasal instillations of the virus into mice, and in 1 the onset of symptoms was within eight days of beginning work with the virus.

All 6 reported cases of human louping-ill have been in laboratory workers, and the present cases are the first in which infection is assumed to have been acquired naturally and outside of the laboratory.

hervibora and in man, it has been objected that the cells were really undergoing phagocytosis, and that the huge cells containing about 200 red blood-cells found in the thyroid gland in man (Duran-Jorda 1947) were the result of an unknown mechanism of cellular degeneration (*Lancet* 1947).

It was decided that the point could be proved more conclusively if it was demonstrated with red blood-cells of a characteristic shape, and for this reason the camel was chosen, because it has elliptical red cells. The idea was to demonstrate that the granules contained in the eosinophils of this animal had the same characteristic appearance as the free red cells. The scientific director of the local zoo provided us with the camel blood; and, since the peripheral blood contained a large quantity of eosinophils, the observations were simple. Smears stained with May-Grünwald-Giemsa showed that all the granules contained in the eosinophils were elliptical. They were smaller than those of the horse but larger than those of man, and it was most satisfactory to be able to find this elliptocytosis in the granules both while they were contained in the cell and after they had broken out of the cytoplasm by the action of smearing. The granules in the eosinophils of the peripheral blood (fig. 3) showed a definite range of sizes, but even at their largest they were never so big as those found in the horse. If the granules can grow larger in the cells, one can imagine their expulsion into the circulating blood as perfectly developed red cells.

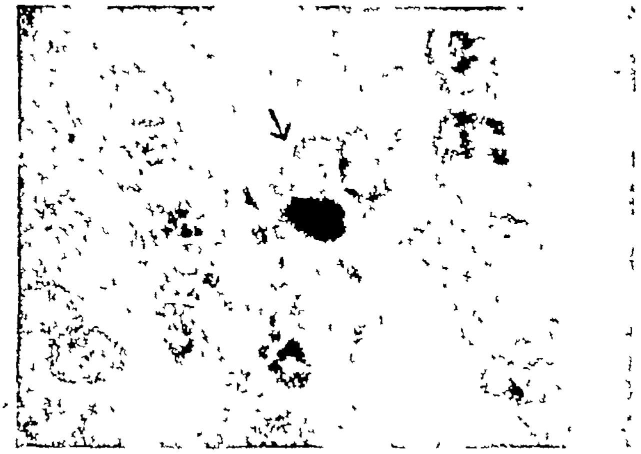
Fig. 2—Gastric mucosa of horse showing eosinophils in situ secreting red blood-cells.

In contrast to the elliptical granules of the eosinophils were the normoblasts, which were round (fig. 4). According to the accepted ideas of blood formation these normoblasts should be denucleated by some unknown process or should undergo either karyorrhexis or expulsion and, in the case of the camel, should afterwards form themselves into elliptocytes, the process laborious that it is difficult to accept. The ell granules of the eosinophils in camel's blood striking contrast to the granules of the basophils, are perfectly circular (fig. 5).

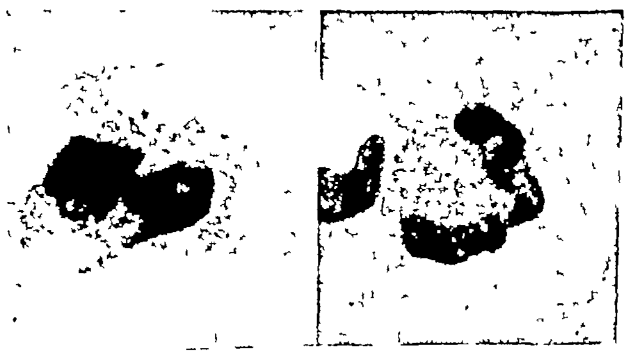
Fig. 3—Camel's blood showing different sizes and elliptical shape of intracellular and extracellular granules.

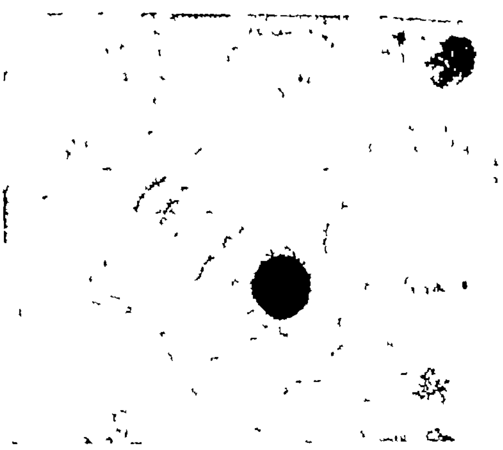
Fig. 4—Normoblast in camel's blood. Note surrounding el red blood-cells.

Owing to the difficulty of obtaining camel t I have not yet had the opportunity of studyi gastric and intestinal mucosa and spleen to find missing link in the complete cycle of blood fo in this animal; but, if such tissues are fortheo should be simple enough to show that the e is the mother cell of the "*mere hæmoglobin* f drops of protein" (Thompson 1942). For hæmat

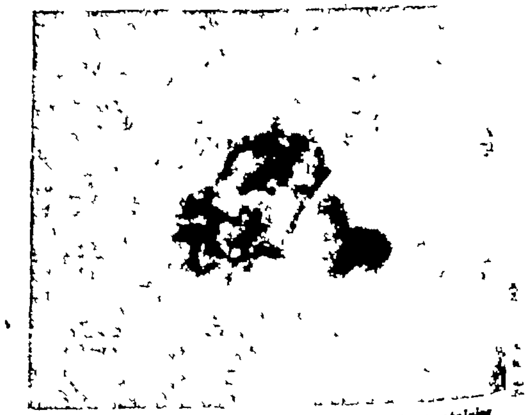
Fig. 5—Camel's blood showing basophil leucocyte containing granules.

who prefer a different interpretation there is the al tive one that the eosinophil is a product of a mo phagocytosis of about 200 red blood-cells whic carefully shrunk until they become eosinophil gr (von Kölliker 1853).

My thanks are due to Dr Leandro Cervera for his siastic interest and helpful suggestions on these pro Inspector Wilfred Taylor, O B S I, for his coöperati supplying veterinary specimens; and Mr. Gerald Ile, logical superintendent of Belle Vue, Manchester, w whose assistance the investigations on camel's blood have been impossible.

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ı to affect the central nervous system. The serum atient who had recovered in 1933 from louping-ill positive complement-fixation and neutralisation with the viruses of both louping-ill and Russian -summer encephalitis, as did the serum of a t who had an encephalitic illness while working he two viruses in the laboratory. There is therefore, ling to Casels and Webster, a striking similarity en the two viruses in their clinical effects, modes nsmission, and immunological responses.

SUMMARY

) cases of louping-ill in man are reported, with ıce suggesting that the infection was acquired ılly and not in the laboratory as in previous cases.

: clinical picture of louping-ill in man is that of go-encephalitis, usually following a prodromal ıza-like illness and followed by complete recovery st cases.

s suggested that the illness would be more often osed if it were suspected whenever a meningo-halitis appears in a person exposed to louping-ill

e evidence linking louping-ill with Russian spring-ıer encephalitis is given.

credit for diagnosis in case 1 lies essentially with the ıt, Mr. William Lyle Stewart, of the Department of ılture, King's College, Newcastle-on-Tyne. To him we ıdebted also for a clear history of his symptoms, for e on how the diagnosis could be established, and for s of further information.

nks are also due to Dr. W. S. Walton, medical officer of ı for Newcastle-upon-Tyne, and to Dr. George Hurrell Dr. E. G. Brewis, medical superintendents of the astle General Hospital and the City Hospital for Infec- Diseases respectively, for facilities provided; Dr. R. n and Dr. Emslie Smith for bacteriology; Mr. G. F. otham for neurosurgical advice; Dr. S. Whately dson for radiological reports; Dr. W. H. H. Merivale ochemistry; Dr. Paul Szekely for helping one of us) with translation of the literature; and Dr. T. H. Dr. L. Richmond, and Dr. G. W. L. Kirk for reference patients and information given.

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LEONTIASIS OSSIUM

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ITH the improvements that have taken place in istry and in the surgery of the nasal accessory sinuses, s of leontiasis ossium should become rare. The skull ı the case reported here has been accepted by the eum of the Royal College of Surgeons.

e patient was a spinster, who died in 1944 at the age of Her appearance and health were normal until the age), when she had a bicuspid tooth stopped. She had no , but a few months afterwards a hard swelling developed e gum above the tooth, followed later by similar changes he cheek. Much dental treatment followed, but the ling steadily increased, spreading to the other cheek and the frontal region. Beyond occasional headaches the ition caused her no physical or social inconvenience. was a charming, witty, and well-beloved lady who inued her work as a book-keeper until four months before death, with only one short period of ill health.

In 1939 she had a transient hemiplegia: blood-pressure 220/95 mm. Hg; left knee-jerk exaggerated and left plantar reflex extensor; otherwise no physical signs. She was working again in six weeks, the left knee-jerk remaining slightly greater than the right and the left plantar reflex indefinite until her death. The B.P. continued high, and there was some cardiac enlargement. Four months before her death she left her office well, but later was found crawling up the stairs to her flat. From then onwards muscular control slowly left her; deafness, which had not been present before, became intense; and her mental faculties were much slowed. However, if one could wait, she would eventually provide a witty and appropriate answer to a question. Swallowing became difficult, hypostatic congestion supervened, and she died in coma.

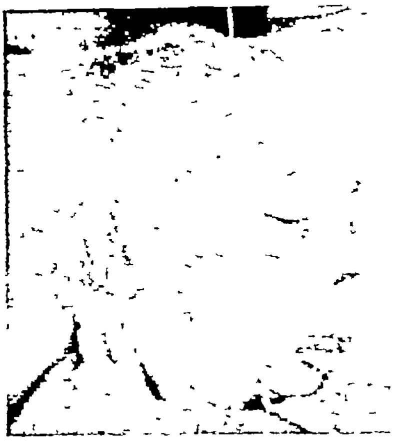

Fig. 1—"Lion-like" head of patient with leontiasis ossium.

Her nares and intranasal spaces were wide, but there was no crusting. She never had a cold. Her ear drums were normal. Bone conduction was lost. Her mandible was not unduly small in comparison with her sister's. Radiogram of the pelvis was normal. For the condition of the skull see figs. 1 and 2.

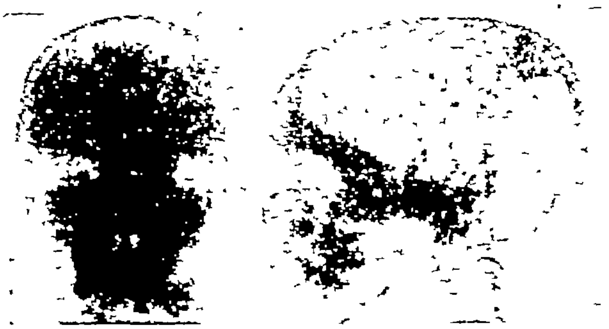

Fig. 2—Anteroposterior and lateral radiograms of skull.

COMMENTS

In view of the hyperpiesia, it can be fairly said that the condition caused little inconvenience to her health and was only slightly contributory to her death.

The history appears to follow the usual lines in that a chronic septic osteoperiostitis follows a sinus infection and one by one the accessory air chambers are filled with masses of inflammatory cancellous bone protruding outwards and causing great disfigurement. Bony changes spread to the skull (cancellous hyperostosis of Virchow); the mandible sometimes is involved, but the base of the skull usually escapes. In the present case, however, the base is involved and the mandible is normal. The lion-like head is well depicted in the photograph. The absence of colds and the dryness of the nose suggest that the mucosa lining the sinuses is the major source of nasal secretion.

". . . Can there be values greater than the mere attainment of health? One reason why we have not been more successful in directing people toward healthful living is that subconsciously many have decided, and quite correctly, that there are more important things than merely being healthy." —W. W. BAUER, M.D., director, bureau of health education, American Medical Association, in Motivation in Health Education. London, 1948; p. 20.

virus of louping-ill. In case 1 the presumption is that the recent severe nervous illness represented this infection. In case 2 evidence for connecting the recent nervous symptoms with infection by the virus is rather stronger, inasmuch as the neutralising properties of the serum had apparently increased in the interval between the first and second bleedings.

"The serum of case 2 did not neutralise the virus of lymphocytic choriomeningitis. It did, however, possess neutralising power against the virus of herpes febrilis, a not uncommon property of human sera."

COMMENTS ON CASES

Dr. Hurst's findings show that case 1 had passed through an infection with the louping-ill virus before October, 1945. The symptoms described conform closely to those previously reported for cases of louping-ill in man. Moreover, case 1 had previously had no illness, however slight, which could have been attributed to louping-ill infection. There are therefore good grounds for assuming that the present illness was the result of infection with the louping-ill virus.

The descriptions of the other human cases are compatible with an incubation period of a few days, comparable with the incubation period in animals, naturally or experimentally infected. Case 1 had had no laboratory contact with the virus for several months, but, within a few days of the onset of his illness, he had been infested with *Ixodes ricinus* from sheep in an area where louping-ill occurs. It seems reasonable to conclude that his present illness was the result of infection transmitted by the tick bite.

In case 2 the evidence that the present illness was louping-ill naturally acquired is even more conclusive. Again there was no history of any previous illness which could have been attributed to the louping-ill virus, and an apparent rise of the protective power of the serum during the illness suggests that the tests were made during the period of infection. Laboratory infection can be excluded. The illness differs from that in any previously reported case in its severity and in the probability that the patient will be left with permanent sequelæ. This may be linked with the observation that the C.S.F. showed a continued pleocytosis and increase in globulin for at least two months and a paretic Lange curve after eleven weeks. Case 2 did not contract the illness until he was 59, though he must have been exposed to the risk of infection for many years. Perhaps poor health, as shown by the loss of energy, appetite, and weight for some months previously, had increased his susceptibility to infection.

DISCUSSION

Louping-ill in man bears comparison with other virus infections of the central nervous system, such as poliomyelitis, and with the illness in animals. The illness in man and in the sheep show many points of resemblance such as the biphasic character, meningeal reaction, and cerebellar signs. The fact that cases of louping-ill in man other than those infected in the laboratory have not previously been recorded is probably due to failure of diagnosis rather than lack of cases. The diagnosis might well be made more often were the clinical picture more widely known.

The clinical picture of louping-ill in man is probably as variable as that of poliomyelitis. It is now known that the classical picture of paralytic poliomyelitis is one of the less common manifestations of the infection, which is often followed by only a mild non-specific illness with rapid recovery; the same may be true of louping-ill. Nevertheless, recognition of louping-ill will depend primarily on recognition of the cerebral type of illness. It is therefore justifiable to try to paint this picture in the light of the limited number of cases so far recognised.

A few days after laboratory exposure to the virus, or after tick bite in an endemic area, the illness begins with malaise, headache, and fever, which continue for a week. There is then an afebrile interval of one or weeks, during which the patient gradually recovers may return to work. The symptoms now return increased intensity—severe headache with fever, bradycardia, drowsiness, insomnia, confusion, and sibly tremors and ataxia. Physical signs are r few but may include neck stiffness, papillœdema, cranial-nerve palsies. The fever abates in a few and the symptoms have largely cleared in a a few weeks elapse before the patient feels fully re During the second phase the blood shows a mild cytosis of 10,000–12,000 per c.mm., with 7 neutrophils. Lumbar puncture yields a clear or blood-stained fluid, with a normal or slightly protein content and a pleocytosis of 50–500 cells c.mm., predominantly lymphocytes.

Variations of this picture so far known are t illness may be mild, ending with the first phase without development of meningo-encephalitis; or first phase may be wanting and the second phase severe, with widespread cerebral involvement tremors, ataxia, and pyramidal signs, and lead permanent sequelæ. The cells in the C.S.F. may be polymorphs.

The disease should be suspected whenever encephalitis develops in a person exposed to the ill virus either in the laboratory or by contact sheep ticks in one of the endemic areas, espec the summer. The diagnosis may be confirmed by neutralisation tests properly carried out and int by an expert. A diagnosis might be made by inoculation of blood removed at the onset of the but it is extremely unlikely that the diagnosis be considered at that stage.

In case 1, when papillœdema was found, espec view of the bradycardia and increasing symp cerebral tumour or abscess was suspected, th primary focus for an abscess was found. The were searched to find if the tumour excised from a seven years previously might have been of a type could metastasise later to the brain, but it pro have been benign. Finally, as recovery ensued, encephalitis of unknown origin was diagnosed, was the patient who offered the diagnosis which ultimately accepted. In case 2 the clinical and findings led to the diagnosis of a virus infection central nervous system, and consideration of his tion and of the area from which he came promoted investigation of his serum.

The relationship of louping-ill to Russian spring-su encephalitis remains to be considered. The work on this disease in Russia in 1937–39 has summarised by Somorodintsev (1944). The illness describes shows striking resemblances to louping-ill is a virus disease transmitted by *Ixodes persulcatus* is transmissible to monkeys, goats, sheep, and and other rodents. It is believed that birds and ro act as a natural reservoir. In man infection prod a severe meningo-encephalitis, with a mortality 20–30%, and with frequent residual paralyses. Whe louping-ill is seen commonly in sheep and uncomm in man, Russian spring-summer encephalitis is com in man; in each case the mortality is high in the commonly affected. Russian spring-summer enceph differs from louping-ill in the incidence of resid paralyses. Casals and Webster (1943, 1944) have stu the viruses of louping-ill and Russian spring-sum encephalitis in relation to other viruses which affect t central nervous system. They have found, by comp ment-fixation, neutralisation, and cross-resistance t on susceptible animals, a very close relationship the viruses of louping-ill and of Russian spring- encephalitis, but no relationship with any other

THE LANCET

LONDON: SATURDAY, SEPT. 18, 1948

Dietary Fat

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[3] Sinclair, H. M. *Proc. R. Soc. Med.* 1948, 41, 541.

Reviews of Books

Acute Intestinal Obstruction

RODNEY SMITH, M.S., F.R.C.S., assistant surgeon, St. George's Hospital, London. London: E. Arnold. 1948. Pp. 259. 18*s.*

GREATER knowledge of the pathology of acute intestinal obstruction has led to much improvement in the results of treatment. This monograph is a timely exposition of the subject. Mr. Smith discusses the pathology, diagnosis, and treatment of acute obstruction and gives an account of the technique of treatment by intubation, and of the nature of the changes in body fluids caused by stoppage of the bowels. A well-illustrated description of the use of radiology in diagnosis is contributed by Dr. Eric Samuel. Every known cause of obstruction, from the level of the pylorus to the anus, is covered, and the book is a reference work which can be well recommended to all surgeons.

Eat and be Healthy

Diets and Nutrition in Ceylon. LUCIUS NICHOLLS, C.M.G., M.D. Camb., sometime director of the Ceylon Bacteriological Institute. Colombo: Associated Newspapers of Ceylon. 1947. Pp. 69. 5*s.* 8*d.*

ALL those who have come across Dr. Nicholls's work on nutrition in Ceylon will be keen to see his synthesis of the subject of diet and will look forward to reading this book. They will not be disappointed. Though, or perhaps because, he has adopted a simple style, his words often have dramatic power. For example: "Some classes of Mohammedan women in Egypt and India practise strict purdah, whereby they spend their lives in closely guarded dwellings; many of these women cannot afford milk, butter, or ghee. Ignorant of the values of fish-liver oil, they become afflicted with osteomalacia, and may become so deformed that they are unable to give birth to a child—pregnancy means death to them." It must not be thought that this book is useful only to the Sinhalese, or to governors and governed in tropical countries. It is also important to those who live in more temperate climates. The diets of native races which are strange to us often throw light on our own dietary problems, as witness the works of Stefánsson on the Eskimos and of Orr and Gilks on the Kikuyu and the Masai, not to mention more recent work by Professor Platt. The problem of nutrition is the same all over the world, though the local solutions may be different.

Principles of Occupational Therapy

Editors HELEN S. WILLARD, B.A., O.T.R., director of the Philadelphia School of Occupational Therapy; CLARE S. SPACKMAN, B.S., M.S. in ED., O.T.R., director of the occupational therapy department, University of Pennsylvania Graduate School of Medicine Hospital. Philadelphia and London: J. B. Lippincott. 1947. Pp. 416. 25*s.*

THE technique of occupational therapy has a growing literature, but far too little attention has been directed towards the underlying principles. How often one hears occupational therapy described as being either diversionary or remedial in purpose, as if that were all. Actually, it has many more important functions: it can be employed as a valuable aid to diagnosis, in the investigation of neuroses and psychoses; it can help to determine activity tolerance, in the treatment of chronic medical disorders; it can help in the restoration of physical and nervous function, imperilled by severe illness or injury; it can provide a useful stimulus to the creative faculty, for patients confined to long periods of inactivity, and help to counter the obsessional anxiety and antisocial tendency of the psychologically disturbed; and it can actually form part of the prevocational testing and vocational training of those who need to change their employment because of serious and permanent disability. The methods by which these uses can be served in different medical and surgical disorders, in the treatment of mental disease, and in the reablement and education of crippled children, of the blind, the tuberculous, and the arthritic, are well described in this volume, though it is more strictly a handbook of occupational therapy than a treatise on principles. Valuable hints are given on the right way to approach a ("try to untanglo his fears and provide him with tives"), on the best methods of instruction, and on types of occupational therapy suited to various diso

The book is almost confined to occupational th as taught and practised in the United States, where appears, there are now 21 schools, almost all conn with university medical centres, and an average 1750 new students each year, each of whom t university course or is already a graduate. Pro because of their preoccupation with American me the authors do not refer to the incorporation of oc tional therapy in industry itself, as carried out so su fully in Birmingham and Luton; to the use o therapy, as in the British Red Cross Picture L scheme; or to Mr. John Colson's valuable book occupational-therapy technique.

Juvenile Delinquency in an English Middletown

HERMANN MANNHEIM, reader in criminology, Uni of London. London: Routledge and Kegan Paul Pp. 120. 12*s.* 6*d.*

Dr. Mannheim has turned to advantage the w evacuation of his university department to Camb though his choice of title may seem a little damp those who consider Cambridge atypical. The follows on the important "Cambridge Evac Survey," and is an ecological study of the records pre-war and 123 war-time delinquent boys pl probation or under supervision. True to modern tical tradition, the author is a severe critic of his material: the records are incomplete, compiled by agencies and with no thought of a possible value; numbers are few and there is no control and anyway, statistics based on court cases are intimately related to the quality of the local activity than that of the delinquent child. Such backs have deterred less determined investigato the work is painstakingly done and (except that of 10 or less are reduced to percentages) is a sound lesson in method for the research student.

The principal findings, as might be expected from material, are cautious and modest, useful for com with other studies and as confirmation rather original. The recommendations are wise and fars but derive more from the author's vast experience from the present study. Dr. Mannheim does not tively answer by this study critics of *Young O* who held that, in this field, there is little fut the method of statistical investigation and th urgent need is still for individual inquiry into psychodynamics of delinquency.

The Report of the ROYAL SOCIETY EMPIRE SCIE CONFERENCE, held in June-July, 1946, has now been pub Besides the papers given at the conference the two vol contain reports of the discussions, the recommend made, and accounts of the origin and conduct of the conf and of the opening ceremony. (Edinburgh: Printed fo Royal Society by Morrison & Gibb. 1948. Pp. 828 and Two vols. 42*s.*)

Taylor's Principles and Practice of Medical Ju prudence (10th ed. Vol. I. London: J. & A. Chu 1948. Pp. 723. 45*s.*).—Few reference books can claim reputation that "Taylor" has maintained in both and Scottish courts since the first edition appeared in this first volume of the 10th edition has been revised broad scale. Prof. Sydney Smith has moulded these volumes for some 20 years, wisely retaining much of Ta original discursive style and shrewd observation, while re scientific method and the ever-changing statutory la conformity with the march of time. The authority of the is beyond question and no review profits by a fine co for gaps in the setting of such a vast field. Much new mat —including innumerable case-reports—has been added care and judgment. The only major mishap in productio an example of the adage that textbooks are always out of da the Workmen's Compensation Acts were superseded on Jul by the National Insurance (Industrial Injuries) Act of 1 and the Law Reform (Personal Injuries) Act, 1948. The b is sound, comprehensive, couched in a fine literary style forthright English, and displays unassailable judgment.

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Continent in the last three years have been of the latter type; and there is no evidence that in these the œdema is caused by fat deficiency.

Provided sufficient calories can be made up from other sources, then, fat in the diet is desirable but probably not essential. Unfortunately, throughout the world foods rich in fats are even scarcer than most other nutritional commodities. This shortage will partly be overcome by the African groundnuts scheme, which might be supplemented by the use of synthetic fats. Research on these was conducted in Germany during the war, and a plant for their commercial production was established at Witten, where fuel was made by the Fischer-Tropsch process from carbon monoxide and steam; a byproduct from this process was "gatsch," which consisted of soft paraffins from which edible synthetic fats could be made. These were tested by some distinguished physiologists in Germany, including **Karl Thomas**, and were used in feeding the armed forces: the Witten plant could produce some 18,000 tons of synthetic fats annually, from which about 7200 tons of margarine could be produced. Further research should be done on this subject. For the present we must consider ourselves lucky in this country to have a relatively luxurious amount of fat in our diet, and it is not surprising that no scientific evidence has been forthcoming of any harm from shortage. It remains possible that the increased palatability and variety afforded by additional fat would improve the nutrition of our workers and promote production. Of this we know very little and need to know more.

Supplies of Radioactive Isotopes

Few medical research-workers in this country have yet been able to use radioactive isotopes for tracer studies and there have been no supplies for treatment. Almost all our knowledge of their therapeutic actions and of the application of tracers to medical and physiological problems has so far come from America. But in a statement published on page 469 the Medical Research Council announce that they can now obtain limited quantities of isotopes for approved tracer and therapeutic projects in this country, and regular supplies are expected soon from Canada and later from the British atomic plants, when completed.

The emphasis on tracer research rather than on treatment reflects the American experience, which has on the whole been disappointing in the clinical field. Radiophosphorus (P^{32}), for example, has been extensively tried for the treatment of leukæmias, polycythæmia vera, and Hodgkin's disease; its use is now limited to chronic myeloid leukæmia and polycythæmia. **Lawrence** and his associates,[1] reviewing the results in 129 cases of chronic myeloid leukæmia treated with radiophosphorus, note that only 33 survived five or more years after the onset of symptoms and the average length of life was 3·7 years. These figures are of the same order as those obtained with X-ray treatment, and radiophosphorus therapy is much more difficult to control owing to the ever-present danger of inducing aplastic anæmia and the need for wide variation in dosage in different patients. Polycythæmia patients have vived much longer and had longer remissions, this accords with the natural history of the and equally good results have been seen with body irradiation or even with periodic A new hazard that has appeared with radio is that it may induce malignancy or even leukæmia, though **Lawrence** did not think that dosage in any of his patients had approached level at which such lesions were induced in mice, none of his patients who had survived five showed any of these changes. The Medical R Council's suggestion that radiophosphorus should be given to patients whose expectation of life is five years seems hardly workable, since at the diagnosis there is no way of distinguishing minority of chronic myeloid leukæmia patients will survive so long, or of finding out which polycythæmia are of the very slowly pro type. Opinion on the value of radioactive hyperthyroidism has not yet crystallised, but again long survival is surely the aim. It is in malignant diseases that radioactive isotopes prove most useful; the council mention cobalt, and there is an important field for trial in use of colloidal gold (Au^{198}) for the loc infiltration of tumours.[2]

Radiophosphorus will cost about 10*s*. and iodine about £1 per millicurie. This means will cost £1–2 for the initial course of tre chronic myeloid leukæmia, and then from 5*s* a week for maintenance. The radio-iodine for of hyperthyroidism will cost £40–50 with p ideas of dosage. Under the National Health the cost will be a Government concern, but it is theless interesting as one of the factors that compared with other treatments giving comp results. For the treatment of leukæmia, therapy costs at least as much and nitrogen somewhat less. For hyperthyroidism, thiouracil much less; the cost of surgical treatment is to estimate, but when the time in hospital is sidered it is probably of the same order as radio treatment.

No-one should imagine that because a rad tracer will help to solve his own particular puzzle can go straight ahead and count on supplies from the necessity of obtaining proper apparatus detecting and handling these materials, two of council's conditions should be specially noted—th physicist must collaborate in the research; and th proper safety measures must be taken. The need a physicist is easy to understand, for the calculati and the apparatus used in this type of work are q outside the medical field. But how many would users of radioactive isotopes realise what is invol in the provision of effective safety measures? avoid over-exposure of workers, the simplest acti like opening a bottle and filling a pipette have all be thought out afresh and carried out by rem control so that the worker is protected by suita screens at every stage. An open beaker contain 5 millicuries of P^{32}, in the form of Na_2HPO_4, radiat 4r per hour 5 inches over the top, 1·2r per hour contact through the bottom, and 0·06r per ho

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[1] Lawrence, J. H., Dobson, R. L., Low-Beer, B. V. A., Brown, B. R. *J. Amer. med. Ass.* 1948, 136, 672.

[2] *Lancet*, 1948, i, 372.

hes from the sides. A tenth of a millilitre of a
ion of radiostrontium (Sr^{89}) of 125 microcurie
ity radiated a tolerance dose (0·1r) in 3 minutes
inches. the normal working distance with a micro-
tte. Tompkins,[3] who gives these figures, shows in
ll-illustrated article the minimum requirements
voiding accidents. As he rightly says, " practice
patience will be required to develop the new
ual dexterity and the new ways for conducting
ratory work that are needed." In addition to
e complications, special measures have to be
n to avoid contamination of clothing, to control
osal of wastes, and to "monitor" by special
ces workers and their instruments for excessive
oactivity. When all this is realised, tracer
arch is likely to be restricted to the larger insti-
ons which can afford the space and financial
ay for special laboratories in which this work,
this work alone, will be done, with the help of
ialists trained to handle these potentially dan-
us materials.[4] It is to be hoped that the necessary
lities for using the new supplies will be provided,
that British workers will have their chance to
lore the tremendous field of experiment now
ned to them.

Health Care

k their new-found preoccupation with social
licine doctors know well enough that they
ng to the social-welfare team; but some are
haps not so sure of their place on the field or the
ction of the goal. The principal cause of this
ertainty is the artificial isolation of one member
m another. The evils of this isolation are under-
ed in a report by Dr. John B. Grant,[5] who lately
dertook for the Rockefeller Foundation a tour of
elve countries in North America, Europe, and
stralasia, to assess and compare progress in
ealth care"—a term to which he gives a wider
aning than medical care. The same pattern is
olving in each country, though in some it is more
nplete than in others. Grant divides the evolution
social welfare into three stages. First comes the
ge of paternalistic legislation, developed in Britain
century and a half ago, with the aim, based on
manitarian motives, of relieving outstanding ills;
countries have emerged from this stage. The
cond is the stage of social insurance, intended to
ovide security for labour by pooling risks;
rmany initiated this some sixty years ago and most
untries are now in it. The third stage is based
uarely on a population policy which aims to
prove the quality of human capital by removing
cial ills.

The funds set aside for social security vary widely
om one nation to another. Thus the British social-
surance costs for this year will be at least 10% of
e national income; and the South African estimate
r 1955 is 15%. On the other hand, in the U.S.A.
1946 federal expenditure on social welfare con-
ituted only 1·3% of the national income. There is
ss discrepancy between the nations in their policies
r housing and nutrition, which reflect growing concern with population needs. Formerly housing policy was based on rental returns, but, except in North America and Holland, this basis has been superseded by various types of State subsidy to ensure that rentals do not exceed 20% of the wage-earner's income—a limitation which, without outside help, would render the construction of houses for letting uneconomic. Similarly, in the matter of food almost every European country is establishing a policy akin to that in Great Britain, including free or subsidised protective foods, enrichment of certain foods, free school lunches, price control backed by subsidies, and increased production of essential foods.

If medical care is to take its proper place in the changing order, three conditions must be met: removal of economic barriers; provision of sufficient personnel and resources, properly distributed; and technical excellence in medical personnel and equipment. Economic barriers are almost everywhere being brought down; the only two countries where voluntary insurance still receives consideration are the U.S.A and, to some extent, Denmark. In organisation other countries, including the U.S.A., seem likely to follow the regional plan introduced in Britain; and usually such plans are formulated with an eye to achieving eventually 15 hospital beds per 1000 population. The Hospital Council of Greater New York[6] sets the figure at 16·1, which would be divided as follows: general care 4·2 (residents 4·0, non-residents 0·2), convalescent care 1·0, long-term illnesses 2·0, acute infectious diseases 0·1, tuberculosis 0·8, and psychiatric disorders 8·0. Grant calls for greater initiative outside the hospital; nowhere, he says, is there a health centre fulfilling all the functions envisaged for this institution. The generous provision of hospital beds and of practitioners (1 to 1500 population) which he mentions may not be immediately attainable here. We can, however, take to heart his criticisms of planning in the countries he visited. The most serious is the complete failure, except in Australia, to consider the number, and the training of personnel required to work the organisation evoked by legislation. Secondly, except in South Africa, planning and legislation are for sickness rather than health. Thirdly, not enough regard is paid to chronic, mental, and rehabilitative services. Planning, he contends, has gone ahead in watertight compartments; and there is complete disregard of the need for auxiliary personnel. From his survey Grant concludes that "effective measures for health promotion, disease prevention, and rehabilitation require government action and cannot be attained through voluntary agencies." It is becoming increasingly clear that this is also true of curative medicine.

Tompkins, P. C. *Nav. med. Bull., Wash.* March-April, 1948. Supplement on Isotopes and their Medical Aspects, p. 164.

Howarth, F. *Lancet*, July 10, p. 51.

Grant, J. B. *Amer. J. publ. Hlth*, 1948, 38, 381.

[6] Hospital Council of Greater New York. Master Plan for Hospital and Related Facilities in New York City. New York, 1947.

The Index and title-page to Vol. I, 1948, which was completed with The Lancet of June 26, is published with our present issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of The Lancet, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

Annotations

THE INDUSTRIAL CONGRESS OPENS

In the early days of the Industrial Revolution machines were more valued than the men who drove them; and it has taken us some time, as Mr. T. E. A. Stowell remarked at the opening session of the International Congress on Industrial Medicine, to realise the importance of conserving the industrial worker. Mr. G. A. Isaacs, Minister of Labour and National Service, mentioned that it is the Government's policy to set up a national industrial health service, coordinated with the National Health Service, as soon as there are enough trained doctors and auxiliary staff to work it. Reviewing some stages in the growth of our industrial medical service, he recalled that Dr. Thomas Legge, the first medical inspector of factories, was appointed just 50 years ago, and was knighted for his success in proposing measures to counteract risks in industry, especially lead poisoning. Other countries have contributed important studies: South Africa, for example, has led in the study of silicosis. For thirty years the Industrial Health Research Board has been issuing important statistics which are ultimately translated into legal requirements and regulations benefiting health. Progress often seems slow; Mr. Isaacs has found it so, he said; but the ground is well prepared, and in the end we get good regulations and enforce them. That the rut of habitual thought may lock the wheel of progress for an unconscionable time, however, was nicely exemplified by Lord Moran's story of a former Minister. Long before the late war the I.H.R.B. had collected figures relating production to hours of work—which were ignored when the pinch came. Yet when Lord Moran handed the harrassed Minister the proof that a man can produce more in 6 days than 7, he only provoked the indignant response: "Don't you know there's a war on?"

But there are more reasons for a falling off in output than unduly long hours of work; and Lord Moran was glad, he said, to see the changing conception of industrial medicine. Nowadays it is concerned not merely with the physical hazards of industry but with the mental and emotional hazards as well—with the proper study of mankind, in short. What makes a man stick to his job? "Work or want" has fortunately gone, in this country and for this time, as an incentive. What takes its place? What industrial medical officer, he asked, is going to write an *Anatomy of Contentment*? If a man is contented his production is high, and efficient production means social security. As Dr. Lloyd Davies urges on p. 465, we must no longer think of work in terms of whether it is harmful but whether it is beneficial to free men with unfettered minds. The secret of a contented mind may be to do a job well.

A PIPERAZINE ANTHELMINTIC

To the growing list of anthelmintics has now been added a piperazine derivative. Formerly the piperazines were administered as urate solvents, and their reintroduction follows the observation that some derivatives were effective against the filarial parasite of the cotton-rat. Of more than 1000 compounds tested by the Lederle Laboratories the one which was most effective and least toxic was 1-diethylcarbamyl-4-methylpiperazine, known more briefly as 'Hetrazan' diethylcarbamazine.

Extensive trials of hetrazan have confirmed that, with a few hundred milligrammes by mouth in divided doses over a period of 3–7 days, *Wuchereria bancrofti* quickly disappears from the blood-stream. It usually reappears a few days after the drug is discontinued; but in patients receiving similar courses lasting altogether 3–4 weeks the parasite has sometimes remained a for about a year. From the U.S.A. have come suggesting that the drug may cure bancrofti inf by killing the adult worm. In any event, the admi tion of hetrazan for short periods is so effective in the peripheral blood of microfilariæ as to suggest possibility of breaking the filarial cycle at the between man and mosquito, for man is the only known Against other filarial infections of man this prep seems to be less effective; but trials are not yet com As often happens with new drugs, there has been trouble with toxicity. Patients receiving hetrazan not confined to bed; and their chief complaints been of headache, lassitude, and vague malaise. symptoms come on within a few hours of the treat being started, but usually disappear within 48 h even where administration is continued. The com seems to be stable under a variety of climatic condi

STREPTOMYCIN IN NON-TUBERCULOUS INFECTIONS

The serious toxic effects common in the meningeal or other forms of tuberculosis treated with courses of streptomycin need not deter the clinician using the drug for short periods in other infections. at this stage, when information concerning dosage indications is badly needed and supplies are relati short, it is in everyone's best interest that suitable c should be treated in hospitals which are fully equi with laboratory facilities, so that both diagnosis treatment can be bacteriologically controlled. another page Prof. Clifford Wilson summarises the findings of the Streptomycin Clinical Trials (tuberculous Conditions) Committee. The treatm many of the conditions mentioned is still in the e mental stage, and it seems advisable to confine the streptomycin to the treatment of meningitis and cæmia due to gram-negative bacilli and other pe resistant organisms which have been found to streptomycin-sensitive. We understand that a amount of streptomycin may be available for distri in the regions for the treatment of these conditio

POSTURE IN ANÆSTHESIA

Man's complex respiratory and circulatory m nisms are adapted to the erect posture. They de on a series of reflexes involving the voluntary mu often affecting muscle tone. In the operating-th the patient is placed in one or other of several unnat postures. Some of the effects of these postures unavoidable. Others, equally distressing, follow impr supervision of placement on the operating-table. anæsthetists have lately underlined the effects of unnatural postures. From observation on experim animals and on man Gordh[1] confirms that deep thesia abolishes most, if not all, of the compensa mechanisms involving vasomotor tone which are nor brought into play by change of posture. He empha the value, as a resuscitative measure, of a head-d tilt—to us the familiar Trendelenburg position. increased venous return in this position ensures filling of the right heart, which results, in accord with Starling's law, in slowing of the pulse-rate and in the blood-pressure. In animals the head-do position acts as an effective cardiac stimulant e after a few minutes of cardiac arrest.

Hasler[2] draws attention to the reduction in the v capacity so common in the anæsthetised patient. T is remedied by a moderate head-down tilt; but w the tilt is excessive the effects are far from good. T extreme Trendelenburg position, so beloved of t

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1. Gordh, T. *Acta chir. scand.* 1945, suppl. 102.
2. Hasler, J. K. *Proc. R. Soc. Med* 1948, 41, 183.

ologist, draws the abdominal contents away from elvis but deposits them on the diaphragm, so ation may be seriously hampered. With a tilt of ıe vital capacity is reduced by some 15% and basal pulmonary atelectasis seems to be the rule. ead-down tilt is not alone in producing this evil ; the gall-bladder bridge, the lithotomy position, ven the lateral kidney position all reduce the vital ty by similar amounts. None of these can be rated as causes of postoperative "chests."

ong the more preventable ill effects are those due lposition of the patient.[3] Here the harm is done essure on certain structures, notably vessels and ı. Even the junior student knows that the arm ıg over the edge of the table is likely to cause a ırday-night palsy." Less familiar are the brachial- palsy due to malplaced shoulder-rests, pulmonary ism due to pressure on the calves, and damage to yes due to trauma during operations on the head ıce. These complications are avoidable by constant nce on the part of all in the operating-theatre. s have long been taught that an anæsthetised ıt gives no warning that his water-bottle is too in the same way students should learn that a ıt who makes no response to the deliberate trauma e operation also does not respond to any other ıa.

HOSPITAL BUILDING

CH of the hospital accommodation in Great Britain solete or obsolescent, and the need for extensive ıl expenditure was one of the most obvious lessons e surveys undertaken by the Ministry of Health g the war. It was therefore one of the underlying rs which tilted the scales in favour of nationalisation e hospitals. The principles now being laid down by Minister for the guidance of regional boards and rnors of teaching hospitals in their building projects herefore important. In general, the Minister is willing ave projects costing less than £10,000 to their etion, but he retains, of course, the responsibility ettling priorities as between the various schemes ıitted, since the total cost of labour and materials not exceed the total allocated to the Ministry for ital purposes and the whole cost will have to be e on the Ministry's estimates. In present circum-ces, moreover, all schemes costing more than £100 first be authorised by the Minister under regu-ns which apply to any kind of building in this ıtry.

ıe allocation of priorities thus vested in the Minister be no enviable task. There are a great many small mes of adaptation and improvements which must go ard. Clearly such objects as nurses' accommodation improvement of catering facilities must receive ı priority. Even if no new wave of hospital struction can take place for some time, the central artment in Whitehall will need to become thoroughly ert on many subjects affecting hospital accommoda-. In the United States the Public Health Service in the last few years built up an extensive section he approval of plans submitted under the Hill Burton and is sponsoring expenditure running to some million dollars a year. Their relations with the pitals are most cordial and it is much to be hoped our own Ministry will send its officials out far and e into the hospital world, so as to obviate the danger lecisions being taken solely on rules and regulations. he past, the necessity to raise the funds for proposed rations has been some safeguard against unessential emes—not always a very satisfactory test, since it excluded many much-needed improvements in the poorer localities. The new system with Government money behind it will work better than the old only if flexibility and continuous personal contact are assured. It would be no bad thing if every officer in Whitehall concerned with hospital administration spent a month each year in travelling round the hospitals with no particular agenda, to learn at first hand how the current rules and regulations tend to hamper the individual hospital.

STUDENT NURSES' SALARIES

THE arguments in favour of raising the training allowance of student nurses were strong when stated in these columns by a correspondent eighteen months ago,[1] and they have since grown stronger.[2] When so much depends on finding and keeping enough new entrants to nursing, it is important to be able to assure the possible recruit that during training she will need no financial support from home—support which many parents of suitable girls are not in a position to provide. Much has of course already been done to improve the lot of the student nurse, and in outlining its many advantages Dr. MacWilliam [3] rightly points out that there is a limit to what an impoverished country can offer for the services of a novice of 18. Nevertheless we are glad to learn that the Nurses and Midwives Whitley Council, meeting on Sept. 13, has in effect agreed to our correspondent's recommendation of a cash allowance of £100 a year. Under the new arrangements students entering training after Jan. 1 will receive £200 a year, out of which those resident in hospital will have to pay £100 for board and lodging—as well as income-tax and National Insurance and superannuation contributions. Existing first-year students, and those recruited before the end of the year, will, if resident, receive £100 a year, and free residential emoluments. Those who live out will receive free meals on duty, uniform, and laundry, besides their training allowances, and in future there will be dependants' allowances of 10*s*. a week for an adult and 5*s*. for the first child. Slightly higher training allowances will be paid to second-year and third-year students, who carry more responsibility, and to students in the special fields of tuberculosis nursing and midwifery. The basic £200 for the first-year student in general training may be compared with the present salary of £145 (for a woman) of which £70 is paid in cash and £75 represents the value of residential emoluments. (Before July 5 the three figures were £130, £55, and £75.) In future the training allowances will be the same for men and women.

The remuneration of student mental nurses and of student nursery nurses is still under consideration.

LEGITIMACY AND ARTIFICIAL INSEMINATION

ITEMS of news about artificial insemination always attract keen popular interest. The *News of the World*, in its issue of Sept. 5, published a report from its New York correspondent concerning the legitimacy of what we are learning to call a "test-tube baby." A wife, it is said, asserted that her husband "on her wedding night in New York informed her that he was unable to become a father and suggested that she consent to artificial insemination." She did so and a child was born. Apparently husband and wife afterwards parted company, for there were legal proceedings in a New York State court over the custody of the child. The judge awarded "principal custody" to the mother but allowed her husband the right of occasionally visiting the child. The wife asked for a declaration that the child was illegitimate, presumably in order to exclude the husband's right of making visits. The New York judge refused. Such a decision, he observed, would be "inhuman, inhumane, and contrary to the highest

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locum, H. C., O'Neal, K. C., Allen, C. R. *Surg. Gynec. Obstet.* 1948, 86, 729.

1. *Lancet*, 1947, i, 190.
2. *Ibid*, Aug. 7, p. 225
3. *Ibid*, Aug. 21, p. 313.

concepts of sociology." He declared the child to be legitimate and the husband to be the legal father. Apparently he laid stress on the fact that the artificial insemination took place with the husband's knowledge and consent. The wife then moved into another State's jurisdiction and obtained from a court in Oklahoma City a ruling that she was entitled to the complete custody of the child.

Into the consequences of a conflict of laws as between different State jurisdictions in the U.S.A. we need not enter. The Oklahoma decision was perhaps a question of custody rather than of legitimacy. The action of a wife in seeking to bastardise her own child is unusual and not such as courts would normally encourage; the material evidence would be of a nature which in some jurisdictions is excluded. Be that as it may, the vital distinction, not clearly drawn in the necessarily abbreviated report to which we have referred, is whether the donor of semen is the husband or someone else. The two eminent legal authorities who contributed to the report of the Archbishop of Canterbury's Commission on Artificial Human Insemination [1] held that, if the donor is not the husband, the child is illegitimate; the fact that the husband has consented to the operation does not affect the position.

THE HEALTH CENTRE

IN the spring of last year the British Medical Association set up a committee, with Dr. Talbot Rogers as chairman, "to investigate and report on existing forms of group practice, including partnerships and other forms of collaboration between general practitioners and to relate this and other experience to health centre development." As part of its task the committee arranged a field survey of present-day practice, and the first part of the B.M.A. council's interim report [2] on the subject is devoted to an analysis of this survey. The conditions under which the general practitioner works are described and an analysis is attempted of the advantages and disadvantages offered to patient and doctor by differing methods of practice. Singlehanded practice is contrasted with various forms of partnership, or group practice, and while agreeing that "there are many highly efficient and successful practitioners working singlehanded, and some who could not work satisfactorily in any other way . . . the council considers the advantages of partnership practice outweigh its disadvantages; it is difficult to conceive a type of general practice more suited to the needs of the present day than a partnership of doctors combining the fine traditions of the family doctor with a variety of interests and experience."

The council emphasises the need for retaining in any future general-practitioner service those features of past methods of practice which have been "largely responsible for the high standard of medical work in Great Britain." Among these it counts the personal doctor-patient relationship, the intellectual stimulus of working in contact with colleagues from a common place of work, the variability and flexibility of practice to suit different conditions, the voluntary nature of partnerships, and the freedom of doctors to organise their work as they think best.

Equal care is taken to detect present defects needing to be remedied in future practice. Chief among these is placed the divorce of preventive and therapeutic medicine, which has ensued with the development and multiplication of local-authority clinics. Throughout the report the necessity is urged for the re-association of these unwisely separated compartments of medical practice so that the practitioner and the public-health officer may coöperate, and sharing each others' tasks be better able to give a continuous and coördinated to the families under their care. Unnecessary i of doctors should be ended; better and more l saving professional premises should be available; ancillary, secretarial, nursing, and dispensing help be put to the greatest possible profitable use. H beds should be provided in which general p could continue to care for patients who need help but not necessarily specialist investigation treatment. Special emphasis is placed upon the for easy access by general practitioners to di facilities, particularly in the fields of radiology pathology. From these considerations the council inevitably to the conception of the health cen well-equipped building housing a group of doctors carry out in a coördinated way all the work at done by general practitioners and clinic medical The range of service to be provided in such a is suggested, and methods of staffing and adminis are discussed. The council has not given its final on all arguable points—some it has reserved for discussion. Perhaps the one upon which we shall urgently await the council's opinion in its final report is that of the need for the p health centres of specialist services (including p radiological and pathological facilities). Me enough agreement has been reached for the be able to suggest that in urban areas a health should be the headquarters of up to eight prac serving a population of about 25,000, and to the type and extent of the accommodation that be needed to provide services adequate to such a tion. This detail of accommodation should be just the architect needs as the foundation for his and it is to be expected and hoped that the p of the council's report will be a stimulus to the tion of a variety of plans suitable for hea construction.

But this alone would not satisfy the council, rightly stress the urgent need for actual exp in health centres. Regretting the conditions necessitated the issue of circular 3/48, which d local authorities from submitting immediate p for health centre provision, the report goes on to s "there are new towns and large housing estates constructed in which some kind of accommodat the health services will have to be built; in would seem an actual economy to build health in the most convenient sites, instead of separate p for the doctor's surgeries and the local services." The council in conclusion reports "is satisfied that the most satisfactory form of at present and in the immediate future is practice from a common surgery. It believes logical future development will be the pro specially designed health centres from which general practitioners and the present local services can be provided. . . . Early experiment is able and a central committee should be without delay to offer guidance during this ex period and to collect information of the results ach

This report last week had a favourable rec in the national press. It was described as a d of great value, and we may well concur, for the c has done a great constructive service, first by its field survey, and secondly by its clarification of problems involved and its suggestions for their solution. The report should become a landmark in story of health-centre development, and we hope th may prove of great assistance to the members of authorities, of executive councils, and of local me committees, in whose hands the future of health ce now lies, and upon whose enthusiasm their development will depend.

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[1] See annotation, *Lancet*, Aug. 21, p. 298.
[2] *Brit. med. J.* Sept. 11, suppl. p. 107.

Special Articles

THE MORALS OF EMPLOYMENT*

T. A. Lloyd Davies
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AN'T do it, doctor. Every time I goes on the job ne stomach, doctor." This is the problem which ntly faces industrial medical officers. An appar- nealthy and normal person, working in healthy, r even the best possible working conditions, finds rk repulsive. Is such a patient to be forced to ake work under those conditions because the ajority of his fellow workers find those conditions ctory or even to their liking? Or is he, because kes complaints which, though genuine, cannot be ntiated by any subjective or objective test, to be l to change the conditions of his work? This is medical problem; it is a moral problem and one however hard we may try, we cannot avoid.

these times, which politicians and more reliable of mankind have foreseen will be known as the f the Common Man, it is paradoxical that the al relationships of the Common Man have been the masses. A workman is engaged by an employer so much work, under certain conditions, for so hours, for a certain amount of money. Perhaps, trade unions meet employers, these items are the natters which can be clearly defined, but the essence ontract of employment is not the quantity of work rate of payment but trust and mutual welfare.

pose my patient is a bus-conductor. He is engaged bus company to issue tickets to passengers for so hours a day, with so many hours stand-over and any hours turn-round time. He is provided with ens at terminals, and he is paid wages which have agreed between his employer and his union. A few onductors may be promoted to inspectors, but for vast majority there is no relation between their est in their work, their enthusiasm, the amount of they do, or their politeness to passengers, and their rds, whether these be in working conditions, hours rk, or wages. To me it would be dreadful to know I was committed for the rest of my life to earn wages h are predetermined, prejudged, and unalterable, her I did my best to further my employer's interest, hether I merely took care not to get the sack.

wards of work are many: first, wages; secondly, ower that wages bring; and thirdly, the opportunity malice, hatred, and all uncharitableness." But the true reward of work is that it provides satisfaction he body, mind, and soul. Alas, work has become nymous with employment, divorced from the zest pride of a good job well done. Individuality has me lost in agreements between unions and employers, hat the clock, with inexorable precision, signals when unceasing burden of employment shall subordinate thought, fancy, and action of my patient to those of neighbours. Let anyone who doubts this look at the lling disgorgement from the mills and factories, at end of the day, of hurrying discordant human beings the modern jargon, personnel). Lest one moment ld be their own, they anxiously run to amusements time-wasting sports where the gregarious instinct es an appreciation of the real purpose of living.

Economic necessity" is said to be the reason for ng married women to return to the mills and factories time when the hours of men are being shortened. self-deception ever more blatant? For "economic ssity" is only a term which enables our own laziness to be blamed on a vague impersonal theory. Women must work for mammon instead of for their children.

The break-up of homes and families will extract a high price from the future. Benevolent authority, efficient school-teachers, balanced school meals, national milk, and orange-juice are poor substitutes for the worst parents. Both at home and at work the art of living is sacrificed to the spurious efficiency of material comfort. The idea of religion is even more unfashionable than the word. Instead of feeding boys and girls on algebraic equations and free milk, schools would do better to teach the inadequacy of man.

In the past we have discussed how many accidents take place at work, whether there is a toxic risk, or whether there is risk of harm to the workman, but this is not enough. If we are to build a country worthy of mankind we must think of work in terms of a job, freely entered, freely done, giving physical well-being, mental exercise, and spiritual hope.

* * *

Such a revolution in the conduct of human affairs is not a vague expression of humanistic hopes but a practical aim capable of immediate realisation. Craftsmanship is neither possible for, nor within the abilities of, all, but pride of achievement is still within the reach of those who seek fulfilment in living. The attitude of mind to work is as important as the job; to make certain that work gives the opportunity of interest and joy is the function of management; to seize that opportunity is the chance of the individual. The revolution of human beings, or the demechanisation (from within and from without) of the human body and soul, would achieve more for human well-being and happiness than all the material advances of the Industrial Revolution.

We must no longer think of work in terms of whether it is harmful but whether it is beneficial to free men with unfettered minds. When next, as employers, doctors, and workmen, we interview my patient who finds his work distasteful, let us remember that perhaps, unlike his fellow men who have become conditioned to disharmony, he has kept alive the spark of divine grace, so that before he can attain fulfilment he must have satisfaction in his work. He, not they, more nearly approaches the normality intended for mankind.

PROPRIETARY MEDICINES UNDER THE NATIONAL HEALTH SERVICE ACT

E. W. Godding
CHAIRMAN, STANDARDS COMMITTEE, CHEMISTS FEDERATION

It is clearly essential that the best medicines should be freely obtainable in a comprehensive National Health Service. But under National Health Insurance economy in prescribing was fostered by the substitution of drugs and by other questionable methods which often discouraged the conscientious doctor, and were responsible, at least in part, for "the panel" being regarded by the public as a second-rate service.

Hitherto, many new remedies have been produced as the result of research carried out by private firms, and if the N.H.I. policy of discouraging the use of proprietary medicines is adopted in the National Health Service the stimulus for research work by the pharmaceutical industry will be destroyed. Further, if the industry is discouraged from a vigorous policy of development the way may eventually be opened for an influx of foreign proprietary medicines. Active discouragement of proprietary medicines may therefore have long-term adverse effects on our national economy.

PRESCRIPTION OF PROPRIETARY MEDICINES

To determine how far the N.H.I. machinery discouraged conscientious prescribing, some retail pharmacists were invited to carry out surveys of about equal numbers of N.H.I. and private prescriptions covering the same districts and the same period. The results, showing the ratios of proprietary medicines appearing in each group of prescriptions were as follows:

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*ed on a paper read at Roffey Park Rehabilitation Centre training course in April, 1948.

	N.H.I.	*Private*
LONDON S.W. AREA (MAY, 1947)		
No. of prescriptions	1422 ..	825
Proprietary medicines prescribed	82 (*5·8* %) ..	165 (*20* %)
LEICESTER CITY AREA (MAY, 1947)		
No. of prescriptions	755 ..	1000
Proprietary medicines prescribed	70 (*9·3* %) ..	398 (*39·8* %)
GLASGOW CITY AREAS (JUNE, 1947)		
No. of prescriptions	653 ..	1003
Proprietary medicines prescribed	23 (*3·5* %) ..	347 (*34·7* %)

To obtain further information on this question, with the coöperation of certain pharmaceutical houses, 118 doctors were sent an explanatory statement and an invitation to sign the following letter:

> Dear Sirs,—In reply to your letter I would confirm that, in my opinion, the machinery for the control of excessive prescribing, under the present National Health Insurance Act, also operates to discourage and dissuade the practitioner from prescribing many proprietary medicines which he considers useful for the treatment of his private patients.

Of the 118 doctors approached, 64 signed this letter; one signatory was the chairman of a panel committee. Since no steps were taken to ensure that the doctors concerned were a representative sample of the medical population, and since the reasons for not signing the letters (many doctors were on holiday) are not known, no statistical significance can be attached to the results. From the readiness with which the letters were signed, however, there is little doubt that a very large number of signatures could have been obtained.

Taken together the results of these two inquiries suggest that, where doctors are free to prescribe what they consider best for their patients, a much higher proportion of proprietary medicines is used, and it seems reasonable to infer that practitioners have not felt free to follow their judgment in prescribing for their N.H.I. patients.

On the other hand, though documentary evidence is not easily obtained, verbal reports of excessive prescribing under N.H.I. have often been received from pharmacists. As an example, when a N.H.I. patient left a district his landlady approached a pharmacist to dispose of 37 bottles of liniment, all unopened, prescribed for him by a local doctor. It does not require many such instances to show that the elimination of wasteful prescribing would pay for many useful proprietary medicines.

The following principle is offered as a basis for the prescribing of proprietary medicines in the National Health Service:

> *Any proprietary medicine showing a significant therapeutic advantage over existing B.P. preparations can be prescribed under its proprietary designation.*

The interpretation of "significant therapeutic advantage" obviously requires expert opinion. It should be noted that the term applies not only to new compounds but also to improved methods of presentation, providing these have a therapeutic significance. For example, though two preparations contain the same active ingredient, in one the drug may be presented in such a way as to act more quickly than in the other. Again, the potency of a drug may be maintained through the use of stabilising agents; and where particularly nauseating drugs are concerned special flavourings may also offer therapeutic advantages.

The practitioner should be given the duty of applying the criterion "significant therapeutic advantage," thus placing the initial responsibility where it rightly belongs. Any alternative system of central or local control must undermine the basis of professional practice. At same time, routine checks of unnecessary should be made locally and centrally along the force under the N.H.I.

It is suggested that scientific, medical, and ceutical representatives, with scientific members of pharmaceutical industry, should serve on a advisory technical committee whose main function be to provide the Minister of Health, when with an expert interpretation of the criterion "si therapeutic advantage." Reference to such a would be preferable to the too rigid control which be imposed by adhering to an approved list of pro medicines, and it should avoid the anomalies would almost certainly appear if local committees to act independently. A further advantage would the avoidance of the delay which would inevitably in admitting new products to an approved list proprietary medicines.

The function of local medical committees as the prescribing of proprietary medicines would recommend, as was the duty of the local panel what surcharges, if any, should be made in cases to them by the central authority.

COMMENTS

The effect of the suggested system, so far as pharmaceutical industry is concerned, would ensure financial rewards for research and deve work until the resulting new preparations were into the *B.P.* Doubt has, however, been to whether such uncertain rewards would continued application of the industry's resources development and presentation of the new the substances. More definite incentives might there considered. It is true that patent rights occasion, considerable financial rewards, but this cannot be universally applied. Some manufacturers' trade names might be considered, in this connexion it is worth noting that in many and Government departments scant respect is at paid to the registered names of manufacturers' prop preparations.

It is only fair to add that a recent Ministry of leaflet [1] states that "there will be no restriction drugs which may be ordered for free supply proper treatment of any patient so long as they medically necessary." Further, the Minister of said in the House on June 24 that patients are under the new health service, without restriction, every kind of drug and appliance necessary for treatment. He added that any doctor who fai prescribe these drugs would be breaking his term service.

The provisions [2] under the new Act for the surc of any doctor who is judged guilty of excessive scribing, which are very similar to those which ap under N.H.I., have not yet been used for the enforce of restrictions.

The prescribing of proprietary medicines in National Health Service will clearly require official consideration, but given a sense of resp by all concerned it should not be difficult to satisfactory answer to this question. As in all Go ment organisations, it is essential to avoid the s of creative ability and enterprise and to preserve a level of conscientious service.

CONCLUSION

The Ministry of Health has a new responsibil towards the pharmaceutical industry. Until now substantial part of the population outside the scope nal Health Insurance has made it possible for the try to follow a vigorous programme of research development, but this position may be sharply sed if the policy under N.H.I. is continued and ded in the new service.

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[1] General Medical Services. Arrangements Affecting the Ge Practitioner. April, 1948.

[2] Statutory Instruments 1948, no. 507.

accept the benefits of the industry's research while ing it the material encouragement for continuation have a disastrous effect on its future ; on the other , the stimulation of further research and development he industry would contribute much to a vital and ressive health service.

have received invaluable help from Mr. L. Boon of tosan Ltd., and Mr. W. W. Knott of Parke Davis & Co. in obtaining the data quoted in this article.

ERNATIONAL ORTHOPÆDIC CONGRESS IN QUEBEC

COMBINED meeting of the American, British, and dian Orthopædic Associations was held in Quebec June 3 to 6, under the joint chairmanship of the dents of the three associations : Dr. R. I. HARRIS oronto (A.O.A.), Mr. S. ALAN S. MALKIN (B.O.A.), Dr. EDOUARD SAMSON (C.O.A.)

SLIPPING OF THE UPPER FEMORAL EPIPHYSIS

r. S. KLEINBERG (U.S.A.) maintained that incipient ing of the upper femoral epiphysis called for elimina- of the epiphyseal plate by drilling and the postpone- t of weight-bearing till there was clear evidence of hyseal fusion.

r. BECKETT HOWORTH (U.S.A.) reviewed 254 cases, hich 224 had been treated surgically. Operations included attempted manipulative reduction (37), reduction (35), transcervical osteotomy (7), subtro- teric osteotomy (10), and insertion of a bone peg e front of the head (134). In 131 of the last group, ing occurred without further trouble. The condition ld be treated at the earliest stage, when pegging the procedure of choice ; drilling without pegging ineffective. He advocated early movement. Closed tion was only possible if slipping had been recent.

r. CLARENCE H. HEYMAN (U.S.A.) had followed 42 s for 2 years and found a good result in 30. Manipu- n had given a good radiological and excellent clinical lt in 17, and a good radiological result in a further The results in the 8 cases of surgical osteotomy were with aseptic necrosis in 7. Cheilotomy of the osuperior part of the femoral head in 3 cases gave h-improved function without degenerative changes. 3 patients submitted to 10 operations for surgical on of the epiphysis clinical and radiological results good.

r. PHILIP WILSON (U.S.A.) dismissed the possibility n endocrine cause, preferring to think it mechanical, as the treatment. Early diagnosis, with nail fixation. important. He believed that cases thought to have e well with manipulation would have done equally without it.

DEVELOPMENTAL COXA VARA

r. A. B. LEMESURIER (Canada) reviewed develop- tal coxa vara, which, he said, usually first became ent with a limp or waddle at the age of 3–4 years. ilial cases occurred. The most characteristic feature a gap in the bony femoral neck, which usually filled tually. Intertrochanteric osteotomy had been per- ed in 12 cases, and in all but 1 the gap had been edily closed. A case seen before important coxa vara developed might be treated by a central bone-graft.

r. WILLIAM T. GREEN (U.S.A.) regarded the condition failure of ossification of a part of the femoral anlage. rder to secure sufficient abduction, intertrochanteric otomy was preceded by adductor myotomy.

r. ALBERT KEY (U.S.A.) considered that disappear- e of the gap, which did not always happen spon- eously, might be accelerated by drilling. In adult s he had chiselled away the great trochanter without ch further weakening of the abductors. A Whitman's onstruction had been followed by osteo-arthritis of new joint 15 years later.

ARTHROPLASTY OF THE HIP

Dr. ALEXANDER GIBSON (Canada) reviewed 104 cases of vitallium-cup arthroplasty of the hip with the Kocher posterior approach. The results were : good, 55 ; satisfactory, 21 : poor, 14 ; unclassified, 14.

Dr. PAUL C. COLONNA (U.S.A.) thought that it would be difficult to deal adequately with contracted soft tissues, particularly the ligament of Bigelow, through a posterior approach, and that weight-bearing at 4 weeks, as practised by Dr. Gibson, was unusually early.

Dr. M. N. SMITH-PETERSEN (U.S.A.) had always aimed at producing congruous surfaces, and it was to secure adequate exposure of the acetabulum that his approach had been developed.

CONGENITAL DISLOCATION OF THE HIP

Dr. JUAN A. FARILL (Mexico) spoke of operation on cases of irreducible congenital dislocation of the hip without gross deformity of the femoral head or acetabulum. A wide exposure of the hip was supplemented by subtrochanteric femoral shortening and by the formation of an extra-articular shelf if the acetabulum was shallow. Reduction had been secured in all of 12 cases and had been maintained in 11. No necrosis of the femoral head had been observed.

ARTHRODESIS OF THE ANKLE

Dr. W. E. GALLIE (Canada) described arthrodesis of the ankle-joint by a method which he had used in 25 cases without failure. Near each margin of the joint an anteroposterior mortice was cut, half in tibia and half in talus, each channel being about $1\frac{1}{4}$–$1\frac{1}{2}$ in. high and about $\frac{1}{2}$ in. broad. A tibial graft was then driven into each of the mortices. The articular cartilage was not removed.

COMPRESSION ARTHRODESIS OF KNEE

Mr. JOHN CHARNLEY had followed Dr. Albert Key in arthrodesis of the knee by pin fixation of each fragment and bracing the pins together in such a way that they could be forcibly approximated so as to impact the cut bony surfaces with a force of the order of 50 pounds. In 17 consecutive cases of osteo-arthritis (degenerative arthritis) or healed tuberculous arthritis, the junction had been solid by the 21st, 14th, and even 12th day after operation.

ARTHROPLASTY OF THE KNEE

Dr. HAROLD B. BOYD (U.S.A.) for Dr. J. S. SPEED and Dr. PHILIP C. TROUT had followed up 64 cases of fascial arthroplasty of the knee for 5–25 years or longer. It took 5 years to achieve full improvement, and thereafter function remained surprisingly constant. Only cases following acute infective arthritis or trauma were selected. The operative technique was that of Campbell. The results were as follows : good, 28 ; fair, 17 ; poor, 8 ; failures, 11. The poor results were due to inadequate movement (4), instability (1), both inadequate movement and instability (2), pain in addition (1). The authors concluded that : (*a*) careful selection was imperative ; (*b*) granted this, 70% of patients should have good or fair results, and another 12% would prefer their final state to that of ankylosis : (*c*) major functional adaptations might occupy 5 years ; (*d*) if instability appeared, it usually did so during this period : (*e*) thereafter the condition was usually maintained over many years : (*f*) recent advances, notably the development of penicillin, had greatly diminished the number of suitable cases requiring arthroplasty.

Dr. J. EDOUARD SAMSON (Canada) reviewed the results of 50 operations for arthroplasty of the knee in 43 patients, all over 20 years of age. He adopted a simple technique embodying sufficiently wide resection ; the preservation of an intercondylar tongue of tibia, the lateral ligaments, and the patella ; and the interposition of a free flap of fascia lata. 'Cellophane' had been used in 2 or 3 cases, but had caused a reaction and needed removal. Except in a few of the earlier cases, no physiotherapy was given, beyond active exercises, but nearly all received 1–4 conservative manipulations. The functional results were always better than the radiological, and were classified as follows : excellent (painless, stable, with flexion to 90°) 15 ; good (similar, but with flexion to 40–60°) 14 ; fair (similar, but with flexion to 20–40°) 9 ; bad 15, including re-ankylosis 12 (with infection 4), instability 1, and pain 2. Dr. Samson concluded that (*a*) arthroplasty of the knee had a place in major surgery, (*b*) it carried no inordinate risk, (*c*) gonorrhœa had, till now, provided the most frequent and most favourable cases, (*d*) cases of rheumatoid polyarthritis should not be operated upon unless arrested; (*e*) cases due to osteomyelitis or tuberculosis were unsuitable; (*f*) good musculature was imperative, and (*g*) the patient's coöperation was indispensable.

DENERVATION OF THE ELBOW-JOINT

Dr. **James E. Bateman** (Canada) had performed neurectomy for the relief of pain in the elbow-joint on 150 cases. The operation was carried out through three incisions—at the medial border of biceps tendon, at the lateral border of biceps tendon, and posteriorly for the nerve to anconeus. Of 8 patients followed up after neurectomy for pain from osteo-arthritis or traumatic arthritis, all had less pain and showed a slight increase in the range of movement.

SUBTROCHANTERIC LIMB SHORTENING

Dr. **Lawson Thornton** (U.S.A.) described a method making use of the nail-plate designed for the treatment of intratrochanteric fractures. The nail was driven into the neck of the femur, and then the appropriate length of femoral shaft was excised immediately below the great trochanter; a spur was left attached to the inner part of the upper fragment, to control rotation. The fragments were brought together and fixed by means of screws and the nail-plate.

MENISCI OF THE KNEE

Mr. **I. S. Smillie** reported that 1300 menisci removed in 7 years included 28 which he considered discoid. He classified them as "primitive" (15), approximating to complete discs; "intermediate" (7), less clearly discoid; and "infantile" (6), being broad menisci with a very thin central zone and somewhat resembling the meniscus of the full-time fœtus. Of the menisci, 8 showed cystic degeneration—a change found in 22% of 468 lateral menisci excised. The other lesions found in the discoid menisci varied with the anatomical type. Only 4 of the primitive discs caused snapping; the others were found in the course of meniscectomy for other symptoms. Besides producing a depression in the upper surface of the meniscus, the femoral condyle exerted a grinding force upon the meniscus and so produced horizontal cleavage. The consequent rift tended to open secondarily on to the lower surface and later the upper, but the horizontal character of the main defect could still be demonstrated. Lesions of the "intermediate" type did not differ from those found in the more typical lateral meniscus; the thin portion interposed between the femoral and tibial condyles was never injured. The "infantile" type often showed an incomplete transverse tear.

Mr. **T. J. Fairbank**, in a study of the knee-joint changes after meniscectomy, had compared the pre-operative and postoperative radiographs in 107 cases of meniscectomy, excluding all cases revealing pre-existing osteo-arthritis. Three groups of changes were found: a distally directed ridge at the margin of the femoral articular surface; flattening of the femoral condyle; and narrowing of the joint space. When this followed lateral meniscectomy, there was often some widening of the medial compartment. A study of elasticity curves of articular cartilage showed that a sustained load produced depression. Morning or evening radiographs of the weight-bearing knee showed its "space" to diminish by 1 mm. during the day. This joint compression must cause a transfer of load to the menisci in a centrifugal manner.

PERONEAL SPASTIC FLAT-FOOT

Dr. **Robert I. Harris** (Canada) and Dr. **T. Beath** (U.S.A.) recalled that the deformity and stiffness in peroneal spastic flat-foot had long been ascribed to reflex muscle spasm from stimuli arising in the tarsal joints because of severe weak flat-foot. Electromyography revealed no spasm of the peronei; they were merely shortened, and deformity often persisted under anæsthesia. Sloman in 1921, and Badgley in 1927, had demonstrated calcaneonavicular coalition in some cases, and now a further anatomical anomaly had been found—namely, a talocalcaneal bridge comprising a p the medial part of the talus meeting the posterior of the sustentaculum. This anomaly, which co revealed by posterosuperior radiography of the cal was found in 12 out of 17 cases of peroneal 3 of the remainder showed calcaneonavicular coali and the other 2 complicated rheumatoid arthritis. bridge might be a synostosis or a coalescentia calcanea, and, if the latter, either a syndesmosis synchondrosis. It had been observed by Pfitzner, related it to the os sustentaculi. The authors cons that the cases with developmental bony anomalies sh no spasm, and that those with arthritis of the joints showed real spasm. In their opinion the follo three types could be distinguished: rigid flat-foot to talocalcaneal bridge; rigid flat-foot due to cal navicular bridge; and arthritic flat-foot with spasm.

Mr. **S. A. S. Malkin** thought that a fourth should be added: the adolescent spasmodic flat- following strain of the subtalar and midtarsal joints.

ASEPTIC NECROSIS OF BONE AFTER INJURY

Dr. **Edward L. Compere** (U.S.A.) spoke of the necrosis which may involve large intermediary fr in fractures of the long bones. Regeneration rese that of a bone-graft, and serial radiographs show temporarily increased density. Union normally occ but was delayed.

Dr. **Dallas B. Phemister** (U.S.A.), in dealing the management of the aseptic necrotic head of femur, recalled that in the adult such necrosis im death of the overlying articular cartilage. At a 6–18 months, when it reached the part of the opposite the upper acetabular margin, the fragile gro edge of tissue was apt to yield, so that the upper of the head broke off and collapsed under the of weight-bearing. With fracture of the femoral this happened only if the fracture united. To p this collapse, Dr. Phemister treated 4 cases of un fracture of the femoral neck showing aseptic n of the head by threaded wires and the inserti a tibial graft or grafts through the neck into the part of the head. In each case the fracture and extensive transformation of the femoral head place without collapse, but the time was still too for full assessment. With non-union of 3 years or a reconstruction operation or an arthrodesis was p able. Tibial grafting had similarly been carried out, seeming success, in a case of united femoral neck early collapse of the necrotic head.

Mr. **H. Jackson Burrows** made a plea for preven Once cortical bone had been deprived of its blood-su delay in union was inevitable; worse still, once cancellous end of a bone in an adult had died its art cartilage was destroyed, and little or nothing could done. Apart from proper handling of an injured l it was imperative to avoid unnecessary open operat or, conversely, closed manipulations when open ope would be less damaging.

CERVICAL FRACTURE

Dr. **William A. Rogers** (U.S.A.) observed that tr ment of cervical fracture or fracture-dislocation sh aim at protection of the spinal cord and nerve-r and fixation of the fracture. An emergency collar used till skull traction could be applied. If the verte canal remained seemingly narrow, operation was formed—in the later cases under local anæsthesia. 4 cases the vertebra above the lesion was lifted by gripping its spinous process. Fixation with no stainless-steel wire was supplemented with bone ch and the position was checked radiographically. Trac was continued for 3–5 weeks, and then walking usually begun with a cervical brace. Of 32 patients underwent operation, bony fusion occurring in 20 an average of 4 months. Those not operated up received 10–12 weeks' traction followed by 6–8 mont cervical support. All patients walked finally with support, and 26 resumed full work.

Mr. **E. A. Nicoll** indicated that function depend not upon a good anatomical result but upon stabil Factors favouring instability were intervertebral- damage, rupture of the posterior spinal ligaments ution of the vertebral body. Instability might operation. Simple compression-fracture of a al body was stable, and its treatment was conre. *Fracture-subluxation* with *ruptured inter*al disc and interspinous ligament was reduced ension by gravity and could be treated conely, but it was important to avoid hyperextenFracture-dislocation with locked facets demanded eration and grafting.

FRACTURE-DISLOCATION OF THE PELVIS

F. W. HOLDSWORTH had treated his 50 cases of e-dislocation of the pelvis, due to direct violence. he manner of Astley Cooper, with a partially ng towel held tight with weights and pulleys and trapping traction on the lower limbs, or pin n if one side were dislocated. Reduction was complete. The cases were followed over an e of 5 years. Of 27 with dislocation of a sacro-iliac 2 returned to heavy work, but 15 continued to ain, which was referable to the joint: of 15 t sacro-iliac dislocation, 13 returned to work. ly 2 complained of persistent pain. This tended rove with time, but its persistence for 2 years demand consideration of sacro-iliac arthrodesis.

FRACTURES OF FEMUR

E. HARLAN WILSON (U.S.A.) had come to regard al fixation with screws, and if necessary vitallium as the treatment of choice for fractures of the of the femur. After operation early movements carried out, with sling suspension for 3–5 weeks. z, or use of crutches by the younger patients, was d when the patient could extend the knee fully, to a right-angle, and raise the limb against gravity. mal range of movement was restored within six hs.

LUMBAR DISC DEGENERATION

f. STEN FRIBERG (Sweden) had been able to confirm logically that the lumbar vertebral body above a red intervertebral disc, especially the 4th, slid rds on flexion and backwards on extension. In ts examined soon after death degenerative changes found to be most pronounced in the anterior parts e discs, except the 4th and 5th where they were ly in the posterior parts.

SCOLIOSIS COMPLICATED BY PARAPLEGIA

K. G. MCKENZIE and Dr. F. P. DEWAR (Canada) found that scoliosis with paraplegia was usually enital, sometimes idiopathic, and less often due to myelitis, rickets, or neurofibromatosis. The defor- was severe; and myelograms might show a block e apex of the deformity. Failing an early response nservative treatment, operation should not be unduly yed. The dura was found to be tightly stretched at site of an angular deformity, compressing the spinal which was not itself stretched. It was released by ion of the dura.

PRESIDENTIAL ADDRESS

Harris recalled that the American Orthopædic ciation was but eight years old at the time of tgen's great discovery. In 1912 Macewen had pubd his work on the growth of bone. Then had come wars, and great advances with them. During all time the general surgeon was gradually becoming visceral specialist. There was a common meetingund for all branches of surgery in the basic sciences, arch, and teaching. The claim of orthopædics to ecial field of surgery carried responsibilities. Advance possible over a much broader front than that of e technical improvements. For instance, in histology re was the newer knowledge of intercellular subnces; in biochemistry there was much to learn about ogenesis, and endocrinology had something to tribute to this; the physiology of muscle-fibres ded further study; while in anatomy the relationship ween structure and function could be investigated by dern methods.

RADIOACTIVE ISOTOPES FOR CLINICAL RESEARCH

MEDICAL RESEARCH COUNCIL STATEMENT

THE Medical Research Council have made arrangements to obtain from the United States Atomic Energy Commission limited quantities of certain radioactive isotopes for medical research, including therapeutic investigations. Further, it is expected that regular supplies will soon become available from Canadian and later from British sources.

The Council now invite institutions to submit for consideration detailed programmes of research in the clinical field. The application should include adequate information on the following matters:

(*a*) Specification of the radioactive isotope required.

(*b*) Quantity desired. (Radioactive isotopes with half-lives of less than 30 days may be allocated in fulfilment of one request, in amounts sufficient for six months' needs, with arrangements for shipments at intervals of not less than a week.)

(*c*) Date and rate of deliveries desired.

(*d*) Name of institution at which the materials will be used.

(*e*) Names and research experience of investigators who will use the materials. This list should include the names of the radiotherapist and physicist who will collaborate in the research.

(*f*) Purposes for which the materials will be used, with methods of administration and the dosage proposed.

(*g*) Protection and safety measures to be employed to safeguard the health of the workers. (Useful guidance will be found in the *Introductory Manual on the Control of Health Hazards from Radioactive Materials*, which may be obtained from the Council on application.)

(*h*) Proposed financial arrangements, including the sources from which the applicant will defray the cost of the materials.

Information under these headings, except (*h*), is required by the United States Atomic Energy Commission, as a condition for their supply of the isotopes. The Commission supply isotopes only for accepted lines of research the results of which are fully published, and which are conducted in institutions open to visits from investigators in this field of all nationalities. The Medical Research Council should be notified of any such visits by workers from other countries to any institution receiving the isotopes through their agency.

Progress reports must be made to the Council every six months. In the case of therapeutic investigations, the institution supplied with radioactive isotopes must undertake to register the patients treated, according to the cards and system of the Statistical Department of the General Register Office.

In its application to the Council for radioactive isotopes the institution is required to give the following undertakings:

1. That the materials supplied will not be used in any manner other than that disclosed in the application.
2. That the institution will maintain all necessary protection and safety measures to avoid the special hazards to health arising out of the possession, handling, and use of radioactive isotopes, and will allow inspection of all such protection and safety measures by representatives of the Medical Research Council.

The supplies of radioactive isotopes are at present limited and the materials are costly, especially on account of charges for transport.

It is expected that the isotopes in greatest demand will be radiophosphorus, P^{32}, and the radio-iodine, I^{131}. The following information about the preparations of these two isotopes available is given by the Commission:

Phosphorus 32

Half-life 14·3 days. Beta radiation 1·71 MeV. Supplied as phosphate ion, probably in the form of Na_2HPO_4, in a solution containing 0·5–3·0 millicuries per millilitre. Chemical analysis is furnished with each shipment. *Material will meet the following specifications:*

Concentration.. ..	Greater than 0·5 mC./ml.
pH	7–9
Total solids	Less than 10 mg./ml.
Non-volatile matter ..	Less than 5 mg./ml.
P (inert)	Approximately 0·025 mg./mC. added. (Carrier-free material is available if desired.)
Cl	Less than 5 mg./ml.
Fe Ni Al	*Content so low that no precipitate is formed at pH 7–9*

Iodine 131

Half-life 8·0 days. Beta radiation 0·6 MeV. Gamma radiation 0·367, 0·080, and probably also 0·65 MeV. (10–15%). Carrier-free, in neutral or weakly basic solution containing 0·3–2·0 millicuries per millilitre. Chemical analysis is furnished with each shipment. *Material will meet the following specifications:*

Concentration.. ..	*Greater than 0·3 mC./ml.*
pH	7–9
Total solids	Less than 1 mg./ml.
Te inactive	0·1 mg./ml.
Te active	Less than 1×10^{-4} mC./ml.

The Council will not accept responsibility for the accuracy of the statement as to radioactive content which will accompany each sample, or for the freedom of the sample from toxicity.

The cost of the materials will depend on various factors, including the demand, but is unlikely in the first instance to be less than £1 per millicurie for I^{131} or 10*s.* per millicurie for P^{32}.

While every effort must be made to utilise these therapeutic developments and possibilities to the full, there can be little doubt that, from the long-term point of view, the treatment of cancer and allied diseases is most likely to be advanced by the encouragement of tracer investigations, using both radioactive and non-radioactive isotopes. *Materials for this purpose are also obtainable from the Council, and at present, in view of the small quantities involved, no charge is being made.*

The need for extreme caution in the clinical use of radioactive isotopic tracers cannot be over-emphasised. The safety of non-radioactive tracers should recommend their use in clinical investigations.

DANGERS AND LIMITATIONS OF RADIOACTIVE ISOTOPE THERAPY

Certain dangers inherent in radioactive isotope therapy are becoming recognised, especially in the case of radiophosphorus administered internally as inorganic phosphate. The most serious of these are possible injury to the reproductive organs, genetic damage, the induction of leukæmias and the hastening of the appearance of leukæmic conditions, and the production of malignant tumours. The leukæmogenesis and carcinogenesis, including induction of sarcoma of bone, are likely to be delayed effects, *with a long latent period of possibly five years and probably often longer.* Accordingly, in the present state of knowledge, it is usually unwise to employ radiophosphorus in the treatment of patients of either sex in the reproductive period of life or in patients where the expectation of life exceeds five years.

In general, it must be concluded that therapeutic trials of radioactive isotopes should be limited to cancer and allied diseases, and polycythæmia vera. With rare exceptions, radioactive isotope therapy should not be used in non-malignant conditions. Further, the opinion has been expressed that, in the present state of knowledge, radioactive isotopes should in no case be used in the treatment of children suffering from non- diseases.

Despite these limitations, there is an important for investigation in the therapeutic applications of active isotopes. At first, it will be necessary to techniques and to confirm and extend the results of American workers, while profiting from their c Subsequently, it seems likely that the devel selectively concentrated organic compounds radioactive isotopes may be a promising line of in tion. Probably there will be an immediate though limited field for the use of external applicators sources of beta rays. Experience with artificial ray sources, such as radiocobalt (cobalt 60), in therapy is at present very restricted but this is a for experimental development when adequate supplies become available.

All correspondence should be addressed to the Advisory Panel on the Allocation of Radioactive I Clinical Research, Medical Research Council, 38, Old Street, London, S.W.1.

Public Health

HYGIENE IN PALESTINE

ERIC HARDY
F.Z.S.

UNDER the British mandate, Palestine's public health improved considerably from what had been during the Turkish occupation. control of the mosquito-breeding places greatly the amount of malaria-infested land, and the d of the packs of pariah dogs which had haunted the *of the cities at sundown since Biblical times* remo dangerous source of rabies. In more recent Jewish settlements, with their technical advisers University of Jerusalem and elsewhere, developed of Lake Huleh, Jebel Usdum, and the plain of which had previously been undeveloped swamps. All this useful work is threatened by turbance of the civil war and the lack of scientific *vision of many of the native parts of the* count

The malaria position at the end of the roughly that the malaria risk was high in the Valley from the Syrian border to the south of the Sea, chiefly on the Transjordan side. It was also in marshy parts of the coastal plain near the Sukreir, the Wadi Rubin, and the Tantura area, Wadi Faria near Nablus, and south of Faluja. Jericho, Tiberias, and Safad it was high from Se to December but otherwise moderate; but there little risk around Jerusalem, Hebron, and Lydda.

In 1940, Krikorian and Bedrechi listed 9 sp their *Atlas of the Anopheles Mosquitoes of* published by the department of public health in salem, and a strict and wide control of m the villages was supervised in the later years of mandate by Dr. J. MacQueen, the director of services, and Dr. W. K. Bigger, the A.D.M.S., with Jewish and Arab personnel, and also assistance officers of the R.A.M.C. Together with Jewish sci a malaria research hut was maintained in the no Huleh region where the intensity of malaria in the *villages was very high, the splenic index being* 80– with an extremely high death-rate among children 10 years, so that the natural increase of the pop there was negligible. Lieut.-Colonel R. St. John L. R.A.M.C., describes[1] *an experiment in the mass* of the Huleh villages, made with Dr. Bigger's in January, 1946, primarily to control malaria and borne dysentery, another widespread insect-borne of Palestine which is likely to increase, since the nati practises little personal sanitation.

The three commonest rural malaria-carrying mos in Palestine are the palæarctic *Anopheles sergent superpictus*, and *A. saccharovi* (*elutus*), the last-na

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1. *Bulletin of the Jerusalem Naturalists' Club,* no. 14.

ırgest anopheline in the country. breeding in swamps
stagnant water like Huleh. Many adult mosquitoes
found resting in the dark interiors of cattle byres
papyrus living-huts in the villages. The water is too
for them to breed at Huleh (in the north) at that
of year, but the mosquitoes emerge to lay their
in the warmer weather of April. The malaria season
from then to December, when the mosquitoes
ne torpid again and are then more easily accessible
raying.

ing to the war-time development of the Palestine
h Company's plant at the Dead Sea outbreaks of
ia were traced to the fresh-water swamps on the
-western shores of the Dead Sea at Ein Fashka.
these were controlled by cutting down the vast
ets of phragmites and arundo reeds and admitting
to the cleared channels of fast water from this well-
n spring. Towards the end of the mandate D.D.T.
largely replaced the Paris Green hitherto used in
ing waters.

October, 1942, a malaria survey of the Wadi el
ah—the Arabah of the Bible. an arid desert over
iles long between the Dead Sea and the Red Sea—
nade by Major Lumsden, during the active breeding
n of the mosquitoes. He found both in the Ghor and
adi Arabah *A. superpictus*, the Ethiopian *A. d'thali*,
rgenti, and *A. multicolor*. In February, 1946, an
lition of the Jerusalem Naturalists' Club to the
el Arabah remained a fortnight there. when the
uitoes were studied by Major F. Jacousiel, R.A.M.C.
s found [2] that even in this warm subtropical area
uito breeding is at a very low ebb in February. A
canty specimens of *A. sergenti* and *A. multicolor*
found, adult specimens of the first-named sheltering
ave near the spring of Ein Arus in the Ghor. Larvæ
th species were collected in swamps in that neigh-
ood, which is close to the south shore of the Dead
and at Ein Weba, a small oasis in the heart of the
ah desert. Of the culicine mosquitoes, the expedition
l the large larvæ of *Theobaldia longiareolata* in
t water at almost every spring and marsh visited in
Ghor and the Arabah, and a few larvæ of *Culex*
ns were collected in the springs near Ein Beida.
latter species, with *C. laticinctus*, are the common
n culicine mosquitoes of Palestine, tolerating the
dirty water of ancient stone cisterns, Roman caves,
ete tanks and native wells, and they are abundant
ative village houses. *Uranotænia unguiculata*,
iorhynchus buxtoni, *Ochlerotatus caspius*, and *O.*
us breed in the marshy parts of the country, and
ariæ in saline water in holes by the sea. *Culex*
guus and *C. tritæniorhynchus* prefer cleaner water,
are common.

her insect-pests, like small sand-flies (*Phlebotomus*)
house-flies (*Musca*), are probably as numerous as
naturally can be, and are less likely than the
uitoes to be affected by the lack of scientific
rvision.

Two Outbreaks of Typhoid Fever

Clydeside

sharp outbreak has occurred in the Greenock,
Glasgow, and Gourock areas of Clydeside. By
5 the diagnosed cases totalled 29. The first 3 cases
in holiday-makers in Gourock who had crossed the
h of Clyde to Kilcreggan, a favourite place for
c parties, and there had drunk water (unboiled)
a stream. The next batch of cases came from
bers of a Church organisation, about 700 of whom
on an excursion to the same resort. Large numbers
nown to have drank unboiled water from the stream
24 cases have so far been notified. The remaining
ses are Greenock youths who were camping at
reggan. All cases are due to *Salmonella typhi*. So
he organism has not been discovered in the stream;
e samples taken have revealed 24 types of bowel
nism but no typhoid organisms. It is known that
nage from a few dwellings reaches the stream above
point from which the water was taken, and samples of fæces have been sent for examination from 20 residents of these dwellings. The one food factor common to all cases is the consumption of water from this stream and it is almost certain that this is the source of the outbreak. A vigorous press campaign locally has been prosecuted to ensure that all possible cases are brought to light. It is anticipated that a few more cases will be detected, but the main outbreak seems to have passed.

In Shropshire

On Sept. 5 a night-sister at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, complained of severe headache and was feverish; she had felt unwell the previous day. On Sept. 6 another night-sister and the assistant matron reported with the same symptoms. Next day there were 5 more cases, in a third night-sister, 2 day-sisters, and 2 maids. On the 8th and 9th positive Widal reactions were reported in 9 further members of the nursing and domestic staff, and in 2 children in separate wards who had been feverish since Sept. 5 and 6. Six nurses who went on leave on Sept. 3 and 4 have been reported as cases. Up to the night of Sept. 11 there were 24 cases among the nursing and domestic staff and 4 patients, and a further 3 cases have been confirmed among the outside domestic staff who had been sent home ill.

The signs and symptoms in all cases have been severe headache, temperature generally from 103 to 105°F at night and 100–101°F in the morning, injected conjunctivæ in most cases, and constipation. There have been no preliminary gastro-intestinal symptoms. The original diagnosis was influenza, but on Sept. 7, owing to the continued fever, Dr. Aylmer Lewis took a sample of blood for Widal reaction from a patient who had not had T.A.B. inoculations at any time and on the 9th this was reported as showing a titre of 1/125 for *S. paratyphi-A* and of 1/25 for *S. typhi*. Later samples showed a titre of 1/1000 for *S. typhi*; cultures of blood and fæces have so far been negative. The milk-supply has been investigated, samples of blood and urine and rectal swabs having been taken from all milk handlers at the farms supplying the hospital and from all the kitchen staff; samples of water are also being examined, and so far the distribution of cases and other factors suggest that the water-supply is the most likely source of infection. The population at risk in the hospital is about 400 patients, 170 nurses, 50 indoor domestic staff, 80 outdoor domestic staff, and 12 medical and clerical staff.

Paratyphoid at a Girls' Camp

A party of 42 members of the Oldbury (Worcestershire) branch of the Girls Life Brigade were camping in a small church hall in Pevensey Bay, Sussex, from Aug. 16 to 30, and since returning home many of them have developed paratyphoid fever. By Sept. 10 there were 19 suspected or confirmed cases in hospital. The church hall had main water and drainage, but with 6 adults and 36 girls in it the conditions must have been rather cramped and the lavatory accommodation and cooking facilities were in close proximity. Information was obtained from the local food office as to the main sources from which this party obtained their foodstuffs, and these were investigated, but nothing suspicious has been revealed.

One of the party, who had been doing the cooking, was taken ill with diarrhœa and vomiting about Aug. 22 and had to be suspended from cooking duties. She was removed to hospital for investigation, but by Sept. 11 it had not been proved that this was a case of paratyphoid fever. However, a small boy, aged 8, who had also been in the camp ill with diarrhœa, vomiting, and pyrexia on Aug. 22 was proved to have a paratyphoid B infection. It is understood that this boy had been isolated in the church hall, but under the existing conditions the isolation could not have been fully effective.

It seems probable, therefore, that this boy was the source of infection in the other cases. As to the origin of his infection it is unlikely that he contracted it in Pevensey Bay, since there have been no other cases there, and it seems probable that he was infected before his arrival on Aug. 16.

No secondary cases have arisen in Pevensey Bay up to Sept. 13.

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[2] *Ibid*, no. 20.

In England Now

A Running Commentary by Peripatetic Correspondents

THIS new impulse towards brightening our homes and persons is disquieting to sober conservatives like me. I suppose the urge started with women; after seeing the New Look (which gives them an old one) I can believe almost anything of the other sex. Not that men are altogether guiltless. There's that little matter of the patterned American ties, already mentioned in these columns.

I've always thought that men's clothes should be so quiet that nobody notices them. With these ties that's impossible: they yell at you. I own that I sometimes regret that I haven't a personality that could stand up to such a tie; I confess, too, that I have sourly envied the owners of these ties their American dollars or their American friends. But despite this emotional tinge I stand four-square by my principles—or did until the other night.

I was invited to a private party in honour of a much-loved American orthopædist. After our meal he made a little presentation to five British colleagues as a memento of their visit to him last year. The box was undone; and there, in vivid argument, were the five loudest ties in creation. The ties were donned. Do you know, they were actually very smart; and I felt dim and shabby. Anyone wanting a nice Paisley pattern in exchange for a quarrelsome multihued tie should get in touch with me. Only one thing worries me: surgeons, with their robust extroversion, can wear them all right; but can the physician with his more subtle and refined nature? We shall see. Meanwhile, I attract all eyes with the yellow waistcoat I bought next morning.

* * *

I was interested in what the Empire Conference on Scientific Information Services had to say about abstract journals; as was to be expected they emphasised the need for prompt publication and comprehensive coverage of the scientific journals. They even suggested that abstracts might be prepared from proofs of papers without awaiting their actual publication in the journals; if this arrangement could be applied to journals which publish preliminary reports, then abstracts would be as eagerly awaited as the 9 o'clock news. Better still, the research-worker could ring up abstracts every week or two and report verbally on his latest discovery. Promptness of publication of abstracts seems to be a soluble problem, but complete coverage is a more troublesome matter. It is not always easy to get a copy of the *Proceedings* (in Persian) *of the Society of Industrial Medical Officers of Abadan*, or of the *Compt. rend.* (in Polish) *of the Academy of Sciences of Pinsk.* But even when all the known medical and scientific journals are covered important gaps will still be left.

My wife is a careful reader of the *Daily Rapide*, and we often have the following sort of conversation. She looks up from the paper and asks, "Do you know that extract of dried bear's skin cures rheumatism?" I blush and admit ignorance. "Well, here it is: Prof. Stefan Ivanovitch of Irkutsk has cured hundreds of cases in this way and has increased Soviet productivity by 18%." Or it's Dr. Myron C. Jeggerts of Alabama who has cured peptic ulcers by making the patient stand on his head for 5 minutes daily. After these blows to my professional pride I look out for the further report in the usual journals and abstracts and of course find nothing there. I know the excuses the editors will offer: "How do I know the reports are true?" Surely we all know that our press is the finest and most reliable in the world; and when a newspaper has to print in four pages all the world's news, pictures, and advertisements it need not bother to publish lies. "Then why did not Professor Ivanovitch publish in the usual journals?" Why should he? He is a man of genius; he is not looking for academic promotion and does not need to have a minimum number and weight of reprints. He told the *Daily Rapide*'s correspondent and so reached the whole world and not merely a small coterie of unimportant biased and jealous "scientists."

Sir Isaac Newton discovered the differential calculus and never bothered to publish it at all; many orthodox scientists have sealed up the report of their
in an envelope which was not to be opened for 20
knowing the world was not yet ready to receive
message. Suppose a press correspondent had
Newton, seen a MS. on his table full of hierogl
inquired about it and been told "Oh, that is my
ential calculus"; or if the correspondent was
with the scientist and he happened to drop a hint
the contents of his sealed envelope. Surely it
the bounden duty of the press in such
make known to the world the treasures that
might have remained hidden. I am sorry that the
Society Conference did not arrange with the N
Proprietors Association to keep abstracts informed
scientific discoveries that receive their first
in the lay press.

But even when the press is fully covered there
remains the "occasional" publication which must
not be neglected. A striking example has just
my notice. From time to time I order a cask of
the Much Binding Cider Co. I read the
literature with interest as it is pleasant to know
qualities of what you are going to drink. The
I got an exciting special leaflet. One of the
the company had visited France and had come
a cider of most remarkable qualities; it was of
type, of very high alcohol content, and would
indefinitely; and then in large capital letters I
informed that it was a very potent *aphrodisiac* and
be drunk in the strictest moderation. This was
discovery that the world—if not the scientific
has been waiting for, and if I had not
leaflet the world might never have known. Now
have the laugh of all my pharmacological friends.
they go on frittering away their time on bits of
uterus or intestine or the hundredth anti-hist
local anæsthetic I will be doing some critical
on this most beneficial and potent (that word
not be misunderstood) of therapeutic agents. It
that I am not the actual discoverer; but it is
discoverer but the man who makes the world
a discovery who receives the gratitude and p
mankind.

* * *

One of the curious and inexplicable o
our surgical life is the tendency of diagnoses
consecutively. Perhaps for months we will not
fracture of the femur, and then—presto!—one
in of the shaft, a few hours later another of the n
perhaps the next day a compound one. Not an ep
I may presume, for they come from wholly
parts of the country; but whether the moon was
or whether the accident incidence was filled up
to overflow at that particular moment I am never
to make up my mind.

Or perhaps we will not see a patient who
cæsarean for a considerable period. But then, if we
one, there are sure to be more close on its heels.
it is the same with other diagnoses. Lately the
has been the organ affected. We have seen
litis, fatal and non-fatal, severe and mild, and
noma of the sigmoid in old and young (the last
age 35) and in male and female. They have re
simple excision, end-to-end anastomosis,
perineal resection, and all the variations of the
techniques mentioned in the books. When
over, we may expect to see no more for months in
modest-size hospital.

* * *

We stopped for lunch at an American mess at
It had been the junior officers' quarters of a German
barracks. In the washroom my lay friend asked "
is that contraption, Doc?" On a pedestal was a
porcelain basin with a central drain about 6 inches
About a foot above on the wall were two hand
I had never seen anything like it before, but for
a memory from long-past classical studies gave me
answer. "That is a vomitorium," I said firmly (ch
with one of the local boys, by the way, proved this
right). I had to explain its purposes. My friend
at it with awe. "I always heard the Germans
thorough," he said, "but I had to see this to
just how thorough they are."

Letters to the Editor

THE AGRICULTURAL WORKER

r.—By their article on Aug. 21 Dr. Keatinge and Littlewood have performed a service which has been required. It is time that attention was focused he social conditions of the workers who provide th much of our daily food. I find it difficult, however, lieve that bigger farming units and a special medical e will provide the answer to the man-power prob-

The authors say that the farm worker has little ect of rising in the world. They mention the e of the Government agricultural training scheme x-Servicemen, but not the fact that the Scottish rtment of Agriculture has a waiting-list of over 0 for smallholdings, while Holland, Lincs, has over ex-Service applicants.[1] The personal factor in rship and responsibility therefrom is of considerable rtance. Surely the provision of more smallholdings mall farms would attract greater numbers to the and offer the chance of rising in the world to those the necessary ability. The authors' aggregation rms into bigger units would presumably displace piers of smaller farms and might well displace people from the land, as did the enclosures of the eenth century.

th the statement that small farms are uneconomic not qualified to disagree, but I would be chary of ting the economist's yardstick for a way of life h is the vocation of the small farmer, and in connexion a biological process which is so far removed from the anistic processes of industry. It appears to me that any of the advantages of aggregation of units given he authors, such as easier marketing and bulk ng, can be obtained equally well by coöperative ods, as among the smallholders in the Vale of ham.[2]

e writers state that the change from horse to tractor he farm has made 200–300 acres of arable land the mum for the efficient utilisation of implements and "the present trend of scientific and mechanical ation, too, will increasingly favour larger units of uction." Would it perhaps not be wise to adapt machine to the man and develop the tractor or other implement according to the land and farm on which ll be used? The coöperative ownership by a group rmers of the larger, more expensive, and less used s of machinery is a rather different matter from aggregation of farm units, and is one which could y be encouraged by the Government today. I find fficult to see how such aggregation of farms would ilitate the provision of scientific and technical ce." Is that not a question of availability of experts, s it implied that "compulsion" would be more y enforced with such aggregation? Education and ople are methods more acceptable to the British erament.

many of the advantages claimed by the writers d be obtained by less revolutionary methods through medium of education and existing village organisa- s. The Government are already tackling the housing blem, and much more could be done in this direction. ision of water, sanitation, and power are other urgent irements. Assurance of a just reward would probably more than any other single measure to repopulate countryside.

he authors propose a special medical service. Could the existing country doctor carry out all the necessary minations on entrants into agriculture and other ervision required, backed if necessary by a regional sultant service of specialists in agricultural medicine, lternatively by a regional specialist with an interest he agricultural aspects of medicine? Let us hope it is not necessary to turn the whole structure of our ntryside upside down in order to congregate our cate farm workers into a large conglomeration of and machines under the ever-watchful eye of industrial doctor, perhaps also an industrial chologist, and without doubt a foreman mechanic.

Let us remember that the "efficient," "economic," "large-scale," inorganic, monocultural system of agriculture, developed in the U.S.A. during the last and present centuries, has created one of the largest man-made deserts in the world. Perhaps the "dust bowl" of America cannot happen in this country, but let us not be complacent in our "can't-happen-here" attitude. Let us think much and experiment a lot before we throw overboard the traditional methods of agriculture which have maintained the soil of this island in an unequalled state of fertility and productivity over hundreds of years. Before we grub up our hedges, cut down our hedgerow timber, and grub out our yeoman farming stock let us be quite certain that we know what we are doing.

That is not to say that there is no place in English farming for large units. There have long been larger and smaller units, but the standardisation and industrialisation of agriculture is a conception fraught with danger. I should like to recall Sir George Stapledon's words in *The Land: Today and Tomorrow*: ". . . there is a grave risk of the family farmer being slowly and steadily swallowed up by large and fully equipped farming companies, and this to my mind would be the greatest ill that could befall the countryside."

Hitchin, Hertfordshire. ROBERT WIGGLESWORTH.

SALARIES IN GOVERNMENT SERVICE

SIR,—May I supplement the letter in your issue of Sept. 4? Since temporary M.O.s in the Ministry of Pensions do exactly the same work as the established officers, they are surely entitled to the same remuneration. No allowance is made to them, however, for the absence of pension rights, so they are underpaid vis-à-vis established officers to the extent of £150–200 per annum. Furthermore, should a temporary officer qualify for extra-duty allowance, he is given a bonus of 3% on his salary while his established colleague gets 8%.

Other injustices which should be ended are the recruitment and promotion of established officers while there still exist temporary officers with years of satisfactory service in the Ministry. Such officers should be taken on to the establishment and their pension rights back-dated. Moreover, this sensible method of recruitment would enable the Government to dispense with the services of some of the Civil Service Commission.

Now that the new Act is in operation, surely all Government medical services should be reorganised. At the moment many Ministry of Pensions officers are doing work which rightly is the Ministry of Health's, and on a salary scale below that of Ministry of Health officers.

TEMPORARY M.O. (PENSIONS).

STUDENT SELECTION

SIR,—As the number of methods of selection increases there is a growing tendency to forget certain fundamentals. Nobody overlooks the dilemma produced by an excess of candidates, but fewer and fewer people seem to realise that to deny an individual entry into a field of human endeavour which he is eager to join strikes at the very roots of human dignity. Since all short-time methods of selection are admittedly fallacious in a significant proportion of cases, I submit that equitable selection can be achieved only by raising the standards of training and by suffering a considerable degree of wastage.

If the supply of potential medical students far outstrips the demand is not this a splendid opportunity for obtaining an even better type of doctor by stepping up the intellectual and practical achievements demanded in the medical courses? Admittedly, at least in the beginning, this would involve a great wastage of those who fall by the wayside. But is it not foolish to think that a high level can be achieved without such wastage? A Minister who tried to ordain that all musical composition except that of masterpieces must stop would be regarded as insane. Yet this is exactly what we are doing in trying to cut out wastage of medical students. In a complex activity such as the practice of medicine nothing but an actual attempt can reveal the master and the inept.

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[1] assingham, H. J. The Small Farmer. London, 1947; p. 166.

[2] bid, p. 134.

Biology has shown us the only foolproof method of selection—that of trial and error and of survival of the fittest. This must remain the method of selecting future doctors if the standard of the profession is to go up and not down. Present difficulties may prevent us from giving full rein to this natural method, but at least we should not be blind to the viciousness of present-day restrictions. By making a virtue of necessity we are in danger of perpetuating an undesirable state of affairs. Any society which desires to have a sufficient number of people possessing the highest skills must be prepared to suffer wastage in training.

Usher Institute, ERICH GEIRINGER.
University of Edinburgh.

EXSANGUINO-TRANSFUSION IN ACUTE LEUKÆMIA

SIR,—In his preliminary communication of Sept. 4 Dr. Piney says, "it is impossible to obtain very large quantities of blood at any one time in England." I do not understand on what grounds he makes this statement since he apparently did not apply to any of the regional transfusion centres. Had he done so, and if his patient belonged to one of the commoner blood-groups, his request could probably have been met without difficulty.

Experience so far acquired of exsanguination-transfusion in acute leukæmia suggests that this treatment has probably only a temporary effect. The decision to use it will, therefore, always be a difficult one, but should it ever become a recognised form of treatment it would be well to realise that the provision of the needed amounts of directly matched homologous-group blood will present great difficulty in certain cases. For example, group B and especially group AB, Rh-negative blood will be most difficult to provide in the quantities used in Dr. Piney's case, and group A and group O Rh-negative blood will not be much easier. Group O Rh-negative blood is always in great demand because part of the available supply (only about 7 out of every hundred donors belong to this group) is given to patients whose ABO and Rh groups have not for one reason or another been determined. Many of these patients are, in fact, Rh-positive, and some of them, though Rh-negative, belong to group A. If only the ABO group of these patients were determined, group A Rh-negative blood could be used instead of group O Rh-negative blood, thus lessening the constant drain on the latter. Considerable quantities of Rh-negative blood are, of course, used for the exsanguination-transfusion of infants with hæmolytic disease of the newborn.

It is improbable that any blood-bank could supply on demand sufficient Rh-negative blood for the type of transfusion described by Dr. Piney. In other words, such exsanguination-transfusions should always be deliberately planned in consultation with the regional blood-transfusion officer.

Ministry of Health, London, S.W.1. W. D'A. MAYCOCK.

SHORTAGE OF BLOOD FOR TRANSFUSION

SIR,—Since the war ended, the blood-banks have become progressively less well stocked with blood, presumably because, the fervour of patriotism having died down, donors are far fewer. I understand that the Ministry of Health makes itself responsible for rationing blood to hospitals and doctors, while the Medical Research Council looks after the needs of the research-worker. But practically no attempt is made to increase the number of donors, and so add to the stocks in the blood-banks. Of course, I must admit that some postal-cancellation stamps do inform us that blood donors are urgently needed, but it is doubtful whether many (or any) donors are obtained in this way.

My attention was forcibly called to the matter by Bessis and Bernard's[1] advocacy of exsanguino-transfusion in the treatment of acute leukæmia—a procedure which in the adult requires many pints of blood. The effects are so dramatic (although admittedly cure does not result[2]) that, having seen some of the cases in Paris during the meeting of the European Hæmatological Society, I wished to try it here; but there was not enough blood. One moribund patient was Paris, and was given two exsanguino-transfusions, the expected result—a remission.

Why, then, have the French so much blood, so little? The answer is to be found in the Gallic that is prepared to make use of the strength and nesses of men and women. Thus, every donor is "chits" which entitle him to purchase extra Now, as many members of the public imagine t weakening to give a pint of blood, they feel hap being given the chance of making good the loss those who realise how totally harmless is the are, nevertheless, delighted to get something m eat. Then again, playing on the vainglory of eve each donor is given a card, signed by hand, thank for generously parting with his blood. And, on the of the card, there is an appeal to the emotions: have given of your blood as a gesture of our co humanity, and it may save the life of a woman in of a child (perhaps your own), of an injured wor and so forth.

There are many other useful hints to be gained study of the methods of the Centre National de fusion Sanguine, so admirably organised and Tzanck. For instance, the donors put their arm t a hole in a wooden partition, and so see neit needle nor the blood; and everybody knows how less it hurts if you do not see it. Propaganda, es by posters, has worked wonders in France; why it not do so here? The story is told of a man who to go to the head of a queue in Paris because, he "I have a blood donor's card." "Get to the tail," everybody, "so have we."

London, W.1. A. PI

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[1] Bessis, M., Bernard, J. *Bull. Soc. méd. Hôp., Paris*, 1947, p. 871.
[2] Piney, A. *Lancet*, Sept. 4, p. 379.

CAUSE OF PRIMARY HEPATIC CARCINO

SIR,—The high incidence of primary hepatic c among Bantus[1] has not yet been explained. Ke has shown that it is not due solely to racial factors, the incidence in American negroes is not unduly Berman[3] has pointed out that in races having a incidence of hepatic cirrhosis there is a high in of primary liver carcinoma and vice versa . communities primary hepatic carcinoma predom affects males,[4] and this is especially true of Africa.[1] Where the incidence is high the disease on an average at least 20 years younger than i where the incidence is low. Berman also noted the hepatic cirrhosis on which the cancer superv not multiple nodular hyperplasia due to acute n but, as Stewart[6] had pointed out earlier, a more progressive fibrosis, and that the cirrhosis ant the cancer.

Of the suggested ætiological factors a number c eliminated as not worthy of credence as direct ca e.g., malaria, syphilis, alcohol, heredity, and tra Many parasites have been blamed from time to ti few merit serious consideration. The trouble with of them is that they are either too ubiquitous ubiquitous enough. Thus hepatic distomiasis explain the high incidence in China but hardly in U and schistosomiasis is a scourge both where the inci is high and where it is low. The same can be of other parasites—coccidia, echinococcus, la *Cysticercus fasciolaris*—though the last-named experimentally produced liver sarcoma.[7]

Chemical factors have aroused considerable in since the discovery of the carcinogenic action of the matic azo compounds, *o*-aminoazotoluene and dim aminoazobenzene, and some other pure chem Yet there are difficulties about applying these e mental results directly to liver carcinoma in Thus these carcinogens will cause malignant tu in other organs besides the liver—e.g., vesical papi

1. Berman, C. *S. Afr. J. med. Sci.* 1940, 5, 54.
2. Kennaway, E. L. *Cancer Res.* 1944, 4, 571.
3. Berman, C. *S. Afr. J. med. Sci.* 1941, 6, 145.
4. Willis, R. A. Pathology of Tumours. London, 194
5. Berman, C. *S. Afr. J. med. Sci.* 1941, 6, 11.
6. Stewart, M. J. *Lancet*, 1931, ii, 565.
7. Bullock, F. D., Curtis, M. R. *J. Cancer Res.* 1925, 9, 42

ugh the liver is always directly damaged.[8] The pro- tive changes after azo compounds are regenerative here may or may not be a complicating or simul- us cirrhosis. Indeed it is unlikely that an irreversible sis could be induced by dimethylaminoazobenzene, se of the rapid development of hepatomas. These vations do not concord with the observed cirrhosis- oma relationships in man.

ere is direct evidence that carcinogenic substances ccur in the human liver, but their nature importance are uncertain. The investigations of enberg et al.,[9] des Ligneris,[10] Hieger,[11] and Steiner [12] e summed up as follows :

Source of liver extracts	*Carcinogenic content*
cerous Bantu liver	Considerable amount
n-cancerous Bantu liver ..	Moderate amount
n-cancerous non-Bantu liver ..	Little or none
n-cancerous American negro iver	Little or none

e evidence suggests that these carcinogens are ls and are not related to the aromatic azo compounds. origin is uncertain, but it is suspected that they n some way connected with the diet. In my view is a precise link between malnutrition and primary carcinoma in Africans, and a specific group of ical carcinogens may be involved.

tention has been drawn [13] to the frequency and rtance of malnutrition in Uganda, where nearly African child passes through a clinically recognis- phase of malnutrition, which may recur in adult In this condition there is fat infiltration in the liver,[14] h may progress to a cirrhotic condition, thus explain- n part the very high necropsy incidence of cirrhosis e liver in East Africans.[15] Some other features of an pathology appear to be due indirectly to this mal- tional disease. In Uganda gynæcomastia is rela- y common, and there is a high proportion of noma of the male breast in East Africans.[16] With this ecomastia and tendency to carcinoma in the male a feminisation of the whole body; it is often cult to sex the bones of Uganda Africans, and testes are small and atrophic. There thus may connexion in Africans between liver derangements feminisation of the male. In hæmochromatosis, inisation, loss of hair, and impotence, with the s often atrophic, are far commoner than is generally sed and in frequency come next to the classical d of symptoms.[17]

he mechanism of this connexion appears to have elucidated by Glass et al.[18] who showed that the otic liver could not inactivate œstrogens. Nor is osis necessary, for Hibbs [19] and Klatskin et al.[20] described gynæcomastia in malnutrition. This come about in two ways: the liver may be unable to tivate œstrogens either because of vitamin-B iency [21] or because of a lack of lipotropic factors.[22] nutrition in East Africa is known to be associated pathological changes characteristic of lipotropic- r deficiency.[14, 23] Thus from an early age the liver alnourished Africans cannot metabolise œstrogens. ch are retained in the body and produce feminisation. œstrogens can induce malignant changes—sarcomata he sites of injection, interstitial cell tumours of the es, and carcinoma of the breast in both male and female mice [24]—and they can also cause hepatomas in male mice.[25]

It therefore seems reasonable to postulate that œstrogens might be the cause of the high incidence of hepatic carcinoma in Africans and in any other community where malnutrition and other causes lead to liver damage in young males. The effects would be less notable where liver damage occurs late in life. The accumulation of œstrogens in the African liver and their absence or comparative absence in the undamaged livers of American negroes and of white races would explain the known occurrence of carcinogens in some livers and not in others. On this hypothesis it is unnecessary to invoke other causes, such as parasites and such chemicals as the aromatic azo compounds which the primitive African would be unlikely to meet.

This hypothesis could easily be subjected to experimental proof, though I am not in a position to do this. The administration of œstrogens to male mice with dietetic liver damage or fibrosis should lead to a high incidence of liver carcinomata. If it is correct, the association between cirrhosis and carcinoma depends on the fact that it is only cirrhosis which will cause liver damage over a long enough period to allow carcinoma to develop.

This hypothesis arises out of work done at Mulago Hospital, Kampala, in conjunction with Dr. H. C. Trowell and Dr. E. G. Holmes. They are not responsible for the opinion expressed.

Bristol. J. N. P. DAVIES.

M.R.C.P. EXAMINATION

SIR,—The membership is a test of ready general medical judgment. Since a consultant is one who is suddenly called to give a firm opinion on an unfamiliar case which has baffled those who are familiar with it, this is surely the right kind of test. There may be a place for another examination which demands a high standard in one department of medicine, but that is an inferior principle. "The era of the general physician is passing," according to your correspondents on Sept. 4. Have they never been at a loss to assign a case to its proper specialty? In the all-specialist era, who will be able to do this?

There is no logic or fairness in insisting on a three-year delay after qualification. In all examinations held on this imperfect earth, the undeserving will sometimes fluke his way through; how will it help us if he does so after some years of "experience"? The really good man, the one who is going to benefit most from his experience, will sometimes pass, fairly, just after qualification; why keep him down artificially?

The system of an important examination (like the title and the volume numbering of a periodical) ought to be preserved unless change is really imperative. Continuity is precious. If your two correspondents of Sept. 4 had their way, there would soon be two things, the Old Membership and the New Membership. Some would be sure the Old was better, and others that the New was better. Disputes and confusion would be inevitable.

If the results of the membership depend more on chance than they ought, the reason is not the system but the excessive number of candidates, which has certainly introduced a most undesirable atmosphere of pressure and haste. I suggest the following remedies:

1. The examination should still be held every three months, but no individual should be allowed to take it oftener than once in six months.

2. Really bad candidates should be referred for more than six months, the period varying with their ignorance.

3. If these measures did not suffice, the entrance fee could be increased and a substantial sum refunded for passing at the first or second attempt.

These measures would deter sportsmen from putting a bit on the membership as if it were a horse. To disavow personal bias, let me add that I mean to specialise, and that it was neither very soon after qualification nor at the first attempt that I became

ANOTHER M.R.C.P.

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LETTER TO A NEPHEW

SIR,—The charming letter from an uncle to his nephew, published in your Students' Number is so very much out of date that I hasten to send you a more practical version :

MY DEAR CHARLES,

You are more fortunate than I, for when I thought to enter the profession of medicine I had no near senior relative with whom to discuss this important decision. None the less, I am flattered that today any of the young should consult an ageing relative about the future.

Forty years ago, when I became a student, no one had the faintest provision of the degeneration that was about to overtake not only the profession but the whole social life of the nation, during his working life. With the coming of Lloyd George's Panel Act certain wise men did predict a falling off in the status of the doctor and the standards of practice ; but their forecast was an anæmic dream of what has actually happened. For with the passing of the Bevan Act, the whole of a great profession has been wrapped in complete subservience to the State, from which there is little likelihood of immediate escape. If they had become Civil Servants under the Act, there might have been some minor hope. But doctors have been made something far inferior to Civil Servants, and without their protective armour.

What you have to consider firstly therefore is this. The profession that you propose entering is undergoing a major upheaval. It is changing, via interference from the State, its whole system of practice, and the relations between doctor and patient are bound to alter accordingly. How exactly they will alter is not known ; but the portents are bad. From your point of view you must, as a primary question, ask yourself whether you are prepared to take on your life work in what we will euphemistically call a "service." When the body of the profession were free men they gave service freely to their fellow men, following their own ideas of what was just and right. Yet there were always recognised services that could be entered by students after qualification, usually by further competitive examination. The Royal Navy, the Army, the Royal Air Force, the Colonial Service and its special branches like the West African ; but above all, the finest service of its kind that has ever existed—the Indian Medical Service. But these services never had any gross excess of candidates in their most flourishing periods. Indeed, the Colonial Medical Service always had some difficulty in attracting sufficient candidates. In other words, the practice of medicine in a "service" has never appealed to any but a very small minority of those qualifying as doctors, for the very good reasons that the restrictions of a "service" have always been incompatible with the freedom of thought and action essential to the most intimate of all the professions.

Bearing this in mind, that you are not entering a free profession as in the past, but a departmental service of the State, you may contemplate in the abstract the ethics of the life of a doctor. You will find this very admirably set forth in the letter on p. 358 of THE LANCET of Aug. 28. But the picture there presented dates from before July 5, 1948, and even before 1913 when the first steps were taken down the old rotten weedy slope of State control. You must remember that your patients are going to look upon you now not only as some sort of a "doctor" but mainly as a mechanism through which they can obtain money as sickness benefit, medicine, and many other material things. And you yourself, if a practitioner, are going to find that if you attend to all the regulations and fill in all the forms you will achieve an easier existence by the miserable technique of least resistance. You will hardly have time to enter into your patients' difficulties and gain their trust as in the old days. This is the curse of a "service" !

But do not misunderstand me. There are and always will be those among us who *must* be doctors because any other life is intolerable to them. Some of your background makes me think that you may be numbered amongst these happy few. They are not found in any special class or creed, though naturally more will be found to belong to medical families. At the present time there are large numbers of young men of wholly unsuitable type applying to be apprenticed to the profession, to gain a poor if reasonably certain livelihood, and under the delusion that it will give them some social status. If many of these are admitted, the status of the profession will become lower than it has ever been before, and its social position will be only in the annals of the past. The panel system of Lloyd George was mentally wrong, and has added less than nothing regard of the citizen for the profession. Now every a "panel doctor" there is every reason to think th position will be made immeasurably worse.

To help you to decide this vital question for yo and you alone can decide it—it will be useful to tell what I should do if I had a son in the same dilemma. boy were a fool, I should let him do medicine if he in the hope that he might acquire some sense and a though a poor one. But suppose he were a bright intelligent type, I would go to any lengths to stop him t himself away on the desultory treadmill of the State if I were ultimately convinced, because he defied me insisted on a medical career, that he was one of those *must* be a doctor—just as there are those who *must* priest or who *must* be a veterinary surgeon—I should p relent at the last.

So I can offer you no simple and easy way out of thorny problem. But I can point out that there is one star ahead in a miserable world. You may even live enough to see it, and if it comes to pass during your life you may even be glad if you should choose the prof of medicine. The bright star that I see ahead is this:

The curiously mixed race known as the English passion for freedom, for doing their job in their "own d tinker fashion." Whenever they have in their become oppressed by a vile doctrinaire, be he C Cromwell or James II, the English have thrown him off his works, and reverted to their free way of life. So they see the great light of freedom, and in some m they will rise up and throw off the present false claim State to direct their lives, and they will cast out their sors and their false gods, though they may starve an before they do it. Under such circumstances the pr of medicine will revert to its old system of a free life be carried on in the highly satisfactory manner tha obtained from Hippocrates to 1913. That light worth seeing.

Your affectionate uncle,

THOMAS NE

London, W.1.

IMPORTANCE OF FAT IN THE DIET

SIR,—The view has often been expressed tha vitality of the consumer is influenced by the le his daily fat intake. Thus, the high fat intake American people is considered by Cruickshank[1] one of the factors responsible for their display of dence. Conversely, the reduced fat intake of the people is now alleged to be the cause, or one of the of their present tiredness and proneness to fa Bicknell[2] has written of the present diet being " lessly deficient in fat," adding that "lack of fat is we are all worn out"; the same opinion has expressed by Leyton.[3] Lord Woolton[4] has spok his certainty that the diet is dangerously deficie fat, and Leitner[5] has discussed the diet's nutrit imbalance on that account. Others have written simi Since this belief has received considerable publicit might be profitable to examine how far it is sup by the evidence.

The average daily fat intake during the war years reported to be about 80–100 g.[6]: at present it is s to be about 60 g.[7] The first question is whether war-affected communities consuming a reasonably quate diet with a similar or lower fat intake disp the same symptoms. In the Channel Islands,[8] d the occupation, the daily fat intake was about 40 g., in Switzerland[9] during the war period it was 40–50 yet reports indicate that a high level of fitness preva particularly among the young. Next, it may be inq whether communities whose normal fat intake is are stigmatised by inferior vitality. The South Af

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3. Leyton, R. N. A. *Brit. med. J.* 1948, i, 476.
4. Lord Woolton. House of Lords: Official Report, 1947, 147,
5. Leitner, Z. A. *Med. Pr.* 1948, **219**, 215.
6. Drummond, J. C. Nutritional Requirements of Man in Light of War-time Experience. London, 1948.
7. Mills, G. T. *Brit. med. J.* 1947, ii, 926.
8. Banks, A. L., Magee, H. E. *Mon. Bull. Min. Hlth P.H* 1945, **4**, 184.
9. Fleisch, A. *Schweiz. med. Wschr.* 1946, p. 889.

tu, whose fat metabolism is now being studied (this e reason for our interest in this subject), when living heir customary diet, composed mainly of maize ucts and beans, consume about 30 g. of fat daily; do not behave as "worn-out" persons. The nese,[10] hardly marked by tiredness or lack of self-dence, are reported to consume 15–20 g. of fat daily. remarkable, in the most prosperous regions of Java daily fat intake is reported to be less than 10 g.; according to van Veen [11] the inhabitants are in good tional condition.

nally, in the only long-term fat-metabolism study dult man, a subject consumed 2 g. of fat daily for onths,[12] and no pathological changes were observed s blood, urine, or basal metabolism. Subjectively, erson felt less tired on the experimental diet than on ormal diet.

ere is, of course, no desire to minimise the psychoal, as distinct from the physiological, rôle of fat in liet; the deprivation of fat to those habituated to atively high intake is undoubtedly a grievous hard- But in view of the three types of evidence discussed, surely unjustifiable to define the deficiency symptoms nutrient whose minimum requirement is not yet lished.

A. R. P. WALKER.

Nutrition Unit, Council for Scientific and
strial Research, South African Institute for
Medical Research, Johannesburg.

AND DEATH IN A CONCENTRATION CAMP

R,—I should like to comment on the report of Wolff-Eisner's book in your issue of Aug. 7. As a ner in the concentration camp at Auschwitz-enau and later in a camp in Friedland near Breslau, l opportunity to observe the consequences of famine.

disagree with the statement that raw potatoes ed diarrhœa. On the contrary, in our camp we erately and successfully combated diarrhœa with potatoes. The effect was similar to that of an e diet. Nocturia was not due to "irritable bladder" r. Wolff-Eisner thinks; nor could it have been the equence of incipient famine œdema, for nocturia polyuria started from the first day in prisoners ing from Slovakia in a good nutritional state. It simply the consequence of food being given in the of great quantities of soups—4–6 litres daily. lently such quantities of fluid could not be wholly eted in the day-time, and the evening soup especially to be excreted during the night as it would have e by every healthy subject. In the later stages, of se, the elimination of œdema fluid in the horizontal tion from the lower parts of the body contributed he nocturia in a smaller degree.

were vitamin deficiencies were not observed, because toes, which are rich in vitamin C, and various other tables containing carotene and vitamins B and C tituted in most camps the bulk of the food (kohlrabi, e and yellow turnips, and red beet). It is not surng, therefore, that in Dr. Wolff-Eisner's experience addition of yeast had no remarkable effect.

octors coming to our camp from Theresienstadt rved, as did Dr. Wolff-Eisner, that deficiency of was an important cause of famine œdema, for tion of bacon to the diet caused the œdema to disear. Perhaps a more plausible explanation is that addition of fat calories saved body and blood protein n destruction and enabled the very small amount rotein in the food to be utilised. In all cases of ine œdema in our camp I found the chief cause to ack of calories, although the protein intake (in the n of horse meat) during most of our imprisonment ost covered minimum requirements. But, as the rie intake was always insufficient, body protein t have been destroyed to make up the required d of calories. The result was a fall in blood proteins, ch in turn was the chief cause of famine œdema.

esov, Czechoslovakia JURAJ ORAVEC.

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HOMOLOGOUS SERUM HEPATITIS

SIR,—In the summary of his paper of June 19 (p. 941), Dr. Borensztejn claims that homologous serum hepatitis is transmissible to rabbits. This statement was based on an experiment in which the single rabbit inoculated intravenously with blood from a fatal case of jaundice died two months after inoculation and was found to have necrosis of the liver. The single control rabbit inoculated with distilled water remained well. In case it be thought that the problem of homologous serum jaundice has now been solved, I think it should be mentioned that blood from cases of infective hepatitis and homologous serum hepatitis have been inoculated into rabbits on numerous occasions by various workers in recent years with negative results. As an illustration, three experiments were carried out in 1942 at the Wellcome Institute in London. In the first, two rabbits were inoculated intravenously with blood from a patient with infective hepatitis; in the second, two rabbits were injected intravenously with blood from two cases of jaundice in soldiers of the U.S. Army who had received icterogenic yellow-fever vaccine: and the third pair received blood from two patients with jaundice following inoculation of an icterogenic pool of convalescent mumps serum. All these animals remained perfectly well over a period of a year.

Virus Reference Laboratory,
Central Public Health Laboratory,
London, N.W.9.

F. O. MACCALLUM.

SIR,—In view of Dr. Borensztejn's claim to have transmitted homologous serum hepatitis to a rabbit, some essentially negative work carried out in 1945 may be worth putting on record. Starting from the hypothesis that homologous serum jaundice was not caused by a virus, but was the result of sensitisation by some product of liver damage present in the injected serum, attempts were made to produce a similar disease in rabbits. Two rabbits were treated with carbon tetrachloride over a period of some days so as to produce progressive liver damage; when this was at its height serum was obtained from the animals and was inoculated into other rabbits. Blood samples were taken from these rabbits at weekly intervals and determinations of serum bilirubin were carried out. In all 16 rabbits were observed over a period of up to four months. The results were at first encouraging in that 10 animals showed a progressive rise of serum bilirubin up to a maximum of 1·67% in one instance, while one animal died of acute liver atrophy. As the work progressed, however, it became evident that the effects noted could not be attributed to the experimental processes but were most likely due to some extraneous factor such as a dietary insufficiency or the presence of some infective agent in the stock of rabbits, and the work was therefore discontinued.

While shedding no light on the ætiology of homologous serum hepatitis these results show that liver disturbance, progressing occasionally to acute necrosis, may occur in rabbits apparently spontaneously, and that claims to have transmitted the human disease to rabbits cannot be seriously entertained unless supported by observations on a much larger series of test and control animals.

D. J. BAUER.

Wellcome Laboratories of Tropical Medicine, London, N.W.1.

MAN INTO WOLF

SIR,—With regard to the annotation under this heading on July 10, I think it is of interest to quote Cervantes,[1] who, freely translated, wrote:

> "To suppose that these northern people become she or he wolves is a very great mistake," said Mauricio, "although many believe they do."
>
> "How is it, then," said Arnaldo, "that everybody says, and it is taken for certain, that in the fields of England are herds of wolves which are human beings so transformed?"
>
> "Such a thing," answered Mauricio, "is impossible in England, for in that mild and very fertile country neither wolves nor any other kind of harmful animals such as serpents, vipers, toads, spiders, or scorpions can grow; it is well known that if any sort of harmful animal is brought to England, on arrival there it dies; and if from that

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[1] Los Trabajos de Persiles y Segismunda, book 1, chap. 18.

country any earth is taken to another country and a viper is encircled with it, the viper cannot escape from this imprisoning ring until it dies."

Spain's greatest writer of all time spoke here, as always, in friendly and sympathetic terms of England.

Santa Cruz de Tenerife. JOSE DURAN MOLINA.

POSTCRICOID PHARYNGO-ŒSOPHAGEAL PERFORATION DUE TO ENDOSCOPY

SIR,—In his article of June 26 (p. 985) Mr. Goligher discussed œsophageal and pharyngeal perforation during gastroscopy and œsophagoscopy. Most often perforation is the direct result of this operation, and takes place at the site of the pathological condition for which endoscopy has been undertaken. Occasionally, however, it is produced in the postcricoid region, at a point remote from the primary lesion. As only a few of these accidents have been reported, the following case may be of interest.

A man, aged 73, had for a year been vomiting and complained of difficulty in swallowing. X-ray examination of the œsophagus and stomach showed nothing abnormal. I attempted endoscopy 3 weeks before his admission to hospital, but I could not pass the œsophagoscope behind the cricoid cartilage. The day after his admission I tried again, and again had difficulty at the same place. After some time the instrument suddenly passed the cricoid cartilage, only to reveal loose connective-tissue instead of the œsophageal lumen. It was evident that I had perforated the posterosuperior part of the œsophagus, and shortly afterwards moderate subcutaneous emphysema appeared on both sides of the neck. Mouth feeding was stopped and nutrient enemas (250 g. daily) were given; subcutaneous saline (1 litre daily) and glucose saline (1 litre daily) were infused subcutaneously; and penicillin 25,000 units 3-hourly was started.

Except for slight tenderness on the right side of the neck there was no complaint, and 4 days later the subcutaneous emphysema had completely disappeared. The patient's temperature, however, immediately rose and remained between 100° and 102°F for the next week. The general condition was excellent; but despite complete absence of symptoms and signs a shadow at the base of the left lung was detected radiographically 6 days after the operation. Two days later the temperature rose to 102·8°F; tenderness at the right border of the larynx had increased a little, but there was no trace of infiltration or of air in the subcutaneous tissues, and laryngoscopy showed no abnormality. A mediastinal abscess was strongly suspected, and with local anæsthesia a collar mediastinotomy was done on the right side. The tissues were normal, but as my finger passed behind the cricoid cartilage into the mediastinum a large amount of pus and gas suddenly escaped. A rubber tube covered with gauze was introduced to the bottom of the cavity.

In 3 days the temperature fell to normal, but it soon rose again. Blood proteins and electrolytes, checked daily, were normal. During the ensuing days œdema appeared in the lower extremities and a hydrothorax developed on the left side; the chest was twice needled and 700 ml. of clear fluid evacuated. The patient died from heart-failure 24 days after the perforation.

Necropsy revealed a well-defined empty abscess cavity, 3·5–4 cm. in circumference, beginning behind and to the left of the œsophagus and reaching 15 cm. downwards, without any sign of communication with œsophagus, trachea, larynx, or plural cavities. In the œsophagus a carcinoma about 2 cm. in diameter was seen 3·5 cm. above the cardia. In the left pleural cavity 760 ml., and in the right 100 ml., of clear fluid was found; the lungs were œdematous. Between the layers of the pericardium adhesions, and in the coronary arteries arteriosclerosis, were noted; the valves were normal.

Goligher points out that "the anterior surface of the bony prominence provided by the cervical spine is seldom perfectly smooth, being marked by transverse ridges corresponding to the lower borders of the vertebral bodies, and in patients with spondylitis may be rendered extremely rough and irregular by the presence of pronounced osteophytes or spurs." In my case there was very pronounced spondylitis deformans with big exostoses along the borders of the cervical vertebræ; and these, together perhaps with not too skilful introduction, may have been responsible for the tear. I do not remember, 2½ years after the accident, the position of the head; but, though generally I pass the instrument neck flexed, I probably tried all positions to the difficulty encountered.

With our present knowledge it is obvious that case the amount of penicillin given (25,000 units 3- was insufficient; but even 100,000 units 3-hourly not prevent the formation of a mediastinal the fatal case reported by Goligher. He immediate suture of the tear, or, failing this, and drainage of the wound. Under similar I shall certainly follow his advice.

KARSTEN K

Frederiksborg County Hospital, Hillerød, Denmark.

Chief Surgeon, Ear, Throat Department.

ACCIDENTAL INTRA-ARTERIAL INJECTI DRUGS

SIR,—I was much interested in Mr. Cohen's on the danger of injections being given into ulnar arteries. Both my own ulnar arteries are ficial, and, when having injections, I have had to call attention to them. Perhaps an experienc clearing station in July, 1916, may be of interest:

> In a man with multiple injuries there were wounds forearms with hæmorrhage. The entry wound in the was in such a position that I remarked that time saved if the ulnar artery happened to be superficial: and so was the one in the right arm. The next p had a wound of the superficial ulnar, the abnormality one-sided. Then the anæsthetist looked at his own found he also had one.

Six superficial ulnars in four people at one in that rush the next patient was by the table his turn.

Liverpool. GEORGE C. E.

Obituary

SAMUEL WALTON WHEATON

M.D. LOND., F.R.C.P.

Dr. Samuel Wheaton, who died on Sept. 5 at of 86, was one of the few remaining medical of the old Local Government Board who had Simon and other founders of English State me

Wheaton qualified from St. Thomas's 1886, taking his M.B. Lond. with honours the year, and in 1888 his M.D. After holding an app as resident accoucheur at St. Thomas's H became physician to the Surrey Dispensary and Royal Hospital for Children and Women in the W Road. But in the midst of consulting practice interest was aroused in the new specialty of public —he had taken the D.P.H. in 1889—and in the '90s he became a full-time medical inspector of Local Government Board.

At first he was largely concerned with the epidemics and the improvement of sanitary tion, and to this period belong his notable enteric fever at Atherton, diphtheria at Hinckley, cholera at Ilkeston. Later under Sir Arthur N he was responsible for the administration of the new maternity and child-welfare service, and this included investigations into the incidence and of measles and pneumonia. Dr. Wheaton was also assessor to the Miners' Welfare Committee.

Sir Arthur MacNalty, who was associated Dr. Wheaton in his work at the board and lat the Ministry of Health, writes: "Samuel Wheaton a wise physician, and he brought clinical exper the service of public health. Though a little re in disposition, he was always courteous and consid With his bushy moustache and his broad-brimmed Wheaton looked rather like the conventional idea of artist, and in fact a large portion of his leisure spent in painting in oils. His pictures were often bited, and purple, blue, yellow, and green spla boldly on his canvas showed his mastery of vivid arresting colours. Even in the coldest of winters refused to have a fire in his room: for he maint is spartan way of life prevented the catching ."

06 Dr. Wheaton was elected to the fellowship of al College of Physicians. and from 1926 to 1928 he n their council.

THE LATE PROFESSOR JAMIESON

I add (M. J. S. writes) to the excellent pen of Jamieson drawn by two of his former colleagues columns something more about his life and work s. where for so many years he was an outstanding lity within and without the university? When to Leeds in 1910 Jamieson was still a demon- but that modest title gave no inkling of his g in the school. and that year, on Wardrop 's translation to the chair of medicine, he became full-time professor of anatomy in Leeds.

g his 15 years' apprenticeship as demonstrator he ked in close association not only with a physician- ist who was himself a brilliant teacher. but also succession of budding surgeons—Moynihan. J. F. , and William Gough—all of whom had been demonstrators in the department. It is not ng, therefore, that Jamieson's anatomical teaching loured by practical clinical considerations which reatly to its value, particularly in a school which ainly a training-ground for general practitioners geons. As a teacher he was supreme. His lectures tractive, lucid. and stimulating, but he was at t in the dissecting-room, where, even after he professor, he spent much of his time. Anatomy to attract or to breed good draughtsmen and good s, and his blackboard sketches were masterpieces racy and clarity.

ieson had a long and varied experience as an strator. His own department was exceedingly anaged and that without extravagance. In the years of his professoriate he was also warden of Hall. a hostel for men students. But it was the 1914–18 war that he had his first real tunity to show his capabilities. Professor de Burgh the dean of the medical faculty, was mobilised colonel of Territorials on the outbreak of war. son stepped into the breach. and for the next years deputised for him. In March. 1915, he was f commissioned as major and appointed registrar e East Leeds War Hospital, a big organisation began in part of the Township Infirmary in Beckett and later extended to other institutions inside tside the city. Later he was promoted lieut.- l and became administrator of the hospital. hile he continued to give part of his time to graduate teaching. These strenuous days brought nto closer contact with clinical colleagues and n other walks of life than ever before. He took a ular interest in the welfare of the non-commissioned s and men under his command—many of these me associates who turned to him for help in the ar period are grateful for what he did for them. of Jamieson's greatest pleasures was to take the at the annual reunion dinners of the hospital and rd the first round of drinks. He rarely missed a until he left Leeds in 1936.

1918, while still very fully occupied with his military . he was elected dean of the faculty of medicine airman of its board, complementary offices which d with distinction for 18 years of notable expansion. hool of dentistry (opened 1928), the extensions to partment of physiology (opened 1930), and the on Firth Institute of Pathology (opened 1933) all much to his energy and drive. From 1923 to 1925 s also pro-vice-chancellor of the university, and as eriod coincided with a long interregnum in the hancellorship Jamieson filled this office for the of the 1923–24 session.

received degrees from both the institutions which d served so well, the honorary LL.D. from Leeds 37, and later the M.A. and CH.M., jure officii. from College, Dublin. His portrait by Mr. Leo Whelan iblin. painted in 1937, is now in the medical school at Leeds.

mieson had his own, sometimes unorthodox, methods rking. He was much given to writing memoranda on problems of the hour. These were never typed. except when duplication was essential, but were written in his own clear firm hand. Many of his colleagues have had reason to be grateful for these admirable documents. setting forth in lucid sentences the opinions of a man of vision and sound common sense. He never had a private secretary. The secretary of the school. or dean's clerk, as he was then called, had his own particular duties assigned to him—with a typewriter but no stenographer. Most of Jamieson's memoranda were written, not in the dean's office. which was much too public a place. but either in his own little sanctum with its private stair in the anatomy department or at home during the midnight hours.

In private life, despite certain appearances to the contrary, Jamieson was a sociable and friendly man. Like most people he had his antipathies. but fundamentally he was fair and tolerant, if given at times to the free and forcible expression of critical opinions. No teacher ever held a more assured place in the affection of his students. and his colleagues mourn the passing of a great teacher, a capable administrator and a loyal. warm-hearted. and courageous friend.

A memorial service for the late Mr. J. E. H. Roberts. consulting surgeon to St. Bartholomew's Hospital, will be held in the Church of St. Bartholomew-the-Less. West Smithfield, E.C.1. on Tuesday. Sept. 21. at 1 P.M.

Appointments

Bentham, Florence, M.B. Durh., D.P.H.: M.O.H., Kettering.
Elektorowicz, Adam, M.D. Lwow: radiologist, Bridge of Earn Hospital. Perthshire.

Middlesex Hospital, London:

- Kavanagh, Stephen, L.R.C.P.I., D.L.O.: acting otological registrar.
- Monro, R. S., M.B. Camb., F.R.C.S.: first assistant, professorial surgical unit.

Colonial Service:

- Foster, W. S., M.R.C.S.: M.O. (health), Jamaica.
- Kapadia, K. K., M.B.: M.O., Seychelles.
- Smith, R. B. S., M.B. Durh., D.T.M., D.T.H.: asst. director of medical services, Northern Rhodesia.
- Stobbs, J. E., M.B. Durh.: M.O., Nigeria.
- Urich, L. G. W., M.R.C.S., D.T.M. & H., D.P.H.: deputy director of sanitary service. Trinidad.
- Zahra, A., M.D., B.SC.: M.O., Nigeria.

Births, Marriages, and Deaths

BIRTHS

Adkins.—On Sept. 6, the wife of Mr. E. W. O. Adkins, F.R.C.S.—a daughter.
Hardwick.—On Sept. 3, in London, the wife of Dr. S. W. Hardwick—a daughter.
Henegan.—On Sept. 5, the wife of Dr. Donald Henegan—a son.
Kelly.—On Aug. 30, at Boscombe, the wife of Dr. Reginald Kelly—a son.
Leeson.—On Sept. 12, to Dr. Jean Leeson (née Mackay), wife of Dr. C. A. Leeson—a daughter.
McCall.—On Sept. 9, at Tunbridge Wells. the wife of Dr. Michael McCall—a daughter.
Pearse.—On Sept. 4, in London, the wife of Dr. A. E. Pearse—a son.
Punt.—On Sept. 14, in London, the wife of Dr. Norman A. Punt, F.R.C.S.E., D.L.O.—a son.
Ross.—On Sept. 5, in Edinburgh. the wife of Mr. James A. Ross. M.B.E., F.R.C.S.E.—a daughter.
Taylor.—On Sept. 6, in London, the wife of Dr. G. R. Taylor—a daughter.
White.—On Sept. 7, the wife of Dr. A. A. White—a son.
Wilson.—On Sept. 5, at Ludham, Norfolk, the wife of Dr. Peter Wilson—a daughter.

MARRIAGES

Brown—Hardy.—On Aug. 27, at Great Sampford. Essex, Wilfred Stuart Brown, M.R.C.S., to Betty Stella Hardy.
Livingston—McDonagh.—On Sept. 9, in Jamaica, Sir Noel Brooks Livingston, to Josephine Olga McDonagh. M.R.C.S.
Mathewson—Tierney.—On Sept. 4, in London, John Gray Mathewson, M.B., to Jane Tierney.

DEATHS

Banks.—On Sept. 9, at Hadlow Down. Sussex, Alfred Banks, F.R.C.S., D.P.H., aged 86.
Kempster.—On Sept. 7, in London, Christopher Richard Kempster, M.R.C.S.
Pulling.—On Sept. 9, at Brighton, Herbert John Pulling. M.R.C.S., aged 88.
Soni.—On Sept. 7, in Manchester, Mul Raj Soni, B.A. Punjab. M.B. Edin., D.P.H.
Willis.—On Sept. 12, at Cheadle, Cheshire, Eugenie Leeson Willis. M.A., M.B. Camb., F.R.C.S.

country any earth is taken to another country and a viper is encircled with it, the viper cannot escape from this imprisoning ring until it dies."

Spain's greatest writer of all time spoke here, as always, in friendly and sympathetic terms of England.

Santa Cruz de Tenerife. JOSE DURAN MOLINA.

POSTCRICOID PHARYNGO-ŒSOPHAGEAL PERFORATION DUE TO ENDOSCOPY

SIR,—*In his article of June 26 (p. 985) Mr. Goligher* discussed œsophageal and pharyngeal perforation during gastroscopy and œsophagoscopy. Most often perforation is the direct result of this operation, and takes place at the site of the pathological condition for which endoscopy has been undertaken. Occasionally, however, it is produced in the postcricoid region, at a point remote from the primary lesion. As only a few of these accidents have been reported, the following case may be of interest.

A man, aged 73, had for a year been vomiting and complained of difficulty in swallowing. X-ray examination of the œsophagus and stomach showed nothing abnormal. I attempted endoscopy 3 weeks before his admission to hospital, but I could not pass the œsophagoscope behind the cricoid cartilage. The day after his admission I tried again, and again had difficulty at the same place. After some time the instrument suddenly passed the cricoid cartilage, only to reveal loose connective-tissue instead of the œsophageal lumen. It was evident that I had perforated the posterosuperior part of the œsophagus, and shortly afterwards moderate subcutaneous emphysema appeared on both sides of the neck. Mouth feeding was stopped and nutrient enemas (250 g. daily) were given; subcutaneous saline (1 litre daily) and glucose saline (1 litre daily) were infused subcutaneously; and penicillin 25,000 units 3-hourly was started.

Except for slight tenderness on the right side of the neck there was no complaint, and 4 days later the subcutaneous emphysema had completely disappeared. The patient's temperature, however, immediately rose and remained between 100° and 102°F for the next week. The general condition was excellent; but despite complete absence of symptoms and signs a shadow at the base of the left lung was detected radiographically 6 days after the operation. Two days later the temperature rose to 102·8°F; tenderness at the right border of the larynx had increased a little, but there was no trace of infiltration or of air in the subcutaneous tissues, and laryngoscopy showed no abnormality. A mediastinal abscess was strongly suspected, and with local anæsthesia a collar *mediastinotomy was done on the right side. The tissues* were normal, but as my finger passed behind the cricoid cartilage into the mediastinum a large amount of pus and gas suddenly escaped. A rubber tube covered with gauze was introduced to the bottom of the cavity.

In 3 days the temperature fell to normal, but it soon rose again. Blood proteins and electrolytes, checked daily, were normal. During the ensuing days œdema appeared in the lower extremities and a hydrothorax developed on the left side; the chest was twice needled and 700 ml.. of clear fluid evacuated. The patient died from heart-failure 24 days after the perforation.

Necropsy revealed a well-defined empty abscess cavity, 3·5–4 cm. in circumference, beginning behind and to the left of the œsophagus and reaching 15 cm. downwards, without *any sign of communication with œsophagus, trachea, larynx,* or plural cavities. In the œsophagus a carcinoma about 2 cm. in diameter was seen 3·5 cm. above the cardia. In the left pleural cavity 760 ml., and in the right 100 ml., of *clear* fluid was found; the lungs were œdematous. Between the layers of the pericardium adhesions, and in the coronary arteries arteriosclerosis, were noted; the valves were normal.

Goligher points out that "the anterior surface of the bony prominence provided by the cervical spine is seldom perfectly smooth, being marked by transverse ridges corresponding to the lower borders of the vertebral bodies, and in patients with spondylitis may be rendered extremely rough and irregular by the presence of pronounced osteophytes or spurs." In my case there was very pronounced spondylitis deformans with big exostoses along the borders of the cervical vertebræ; and these, together perhaps with not too skilful introduction, may have been responsible for the tear. I do not remember, 2½ years after the accident, the position of the head; but, though generally I pass the instrument neck flexed, I probably tried all positions to ov the difficulty encountered.

With our present knowledge it is obvious that case the amount of penicillin given (25,000 units 3 h was insufficient; but even 100,000 units 3-hourly not prevent the formation of a mediastinal a the fatal case reported by Goligher. He s immediate suture of the tear, or, failing this, and drainage of the wound. Under similar con *I shall certainly follow his advice.*

KARSTEN K

Frederiksborg County Hospital, Hillerød, Denmark.

Chief Surgeon, Ear, Nos Throat Departme

ACCIDENTAL INTRA-ARTERIAL INJECTIO DRUGS

SIR,—I was much interested in Mr. Cohen's re on the danger of injections being given into ab ulnar arteries. Both my own ulnar arteries are ficial, and, when having injections, I have had oc to call attention to them. Perhaps an experience clearing station in July, 1916, may be of interest:

In a man with multiple injuries there were wounds forearms with hæmorrhage. The entry wound in the le was in such a position that I remarked that time w saved if the ulnar artery happened to be superficial: and so was the one in the right arm. The next pati had a wound of the superficial ulnar, the abnormality one-sided. Then the anæsthetist looked at his own found he also had one.

Six superficial ulnars in four people at one tim in that rush the next patient was by the table read his turn.

Liverpool. GEORGE C. E. SI

Obituary

SAMUEL WALTON WHEATON

M.D. LOND., F.R.C.P.

Dr. Samuel Wheaton, who died on Sept. 5 at t of 86, was one of the few remaining medical ins of the old Local Government Board who had Simon and other founders of English State medic

Wheaton qualified from St. Thomas's Hospit 1886, taking his M.B. Lond. with honours the fo year, and in 1888 his M.D. After holding an appoin as resident accoucheur at St. Thomas's Hospi became physician to the Surrey Dispensary and t Royal Hospital for Children and Women in the Wat Road. But in the midst of consulting practice interest was aroused in the new specialty of public h —he had taken the D.P.H. in 1889—and in the '90s he became a full-time medical inspector of Local Government Board.

At first he was largely concerned with the control epidemics and the improvement of sanitary admi tion, and to this period belong his notable repo enteric fever at Atherton, diphtheria at Hinckley, cholera at Ilkeston. Later under Sir Arthur Newsh he was responsible for the administration of the b new maternity and child-welfare service, and this included investigations into the incidence and mort of measles and pneumonia. Dr. Wheaton was also assessor to the Miners' Welfare Committee.

Sir Arthur MacNalty, who was associated Dr. Wheaton in his work at the board and late the Ministry of Health, writes: "Samuel Wheaton a wise physician, and he brought clinical experience the service of public health. Though a little r in disposition, he was always courteous and conside With his bushy moustache and his broad-brimmed Wheaton looked rather like the conventional idea of artist, and in fact a large portion of his leisure spent in painting in oils. His pictures were often e bited, and purple, blue, yellow, and green splas boldly on his canvas showed his mastery of vivid arresting colours. Even in the coldest of winter refused to have a fire in his room: for he maintai

CUTE BACTERIAL ENDOCARDITIS *

CRIGHTON BRAMWELL
M.A. Camb., M.D. Manc., F.R.C.P.
OR OF CARDIOLOGY IN THE MANCHESTER UNIVERSITY

successful treatment of subacute bacterial endo- with penicillin is one of the most remarkable es in therapeutics in recent years. Five years ago s an incurable disease; no known drug, not even phonamides, could influence its course. though it ed that spontaneous recovery took place occa- . Now we may expect to control the infection in ases, provided diagnosis is not unduly delayed.

cute bacterial endocarditis is a common cause of in patients with chronic rheumatic heart disease ngenital heart disease. Laws and Levine (1933) that it was responsible for death in 29% in their of cases of rheumatic heart disease, and Abbott stated that it was the cause of death in 33% of ts with congenital heart disease.

1944 the Medical Research Council initiated, at centres in Britain, an investigation of the treat- of this disease with penicillin, and Christie (1948) ported the results obtained in 269 cases so treated. partment in Manchester participated in this investi- , and the present paper is based on the first 50 re treated. These may be divided into two groups:

t Series.—33 cases treated before June, 1946, and ed by my colleagues Jones et al. (1947). This may be ed as a fair average sample of the disease. All 33 cases ow been followed up for not less than two years.

nd Series.—17 cases treated since July, 1946. These a rather different category, for many of them had sly failed to respond to treatment elsewhere, and must re be regarded as less favourable from the therapeutic

DIAGNOSIS

is convenient to subdivide bacterial endocarditis acute and subacute. Some cases may be regarded onic, but these do not appear to differ ætiologically those classed as subacute, and clinically there is no dividing line between the two.

ate endocarditis does not concern us here—it ther to be regarded as a complication of some disease. In pneumonia, for example, Luxton and (1943) have shown that bacterial endocarditis is less rare than is generally supposed. It may be portant cause of death, but it generally escapes nition during life, its manifestations being over- wed by those of the more obvious pulmonary lesion. acute cases, in which the infecting organism is only a hæmolytic streptococcus, a staphylococcus, umococcus, or a gonococcus, run a rapid course and ally prove fatal within two months.

subacute bacterial endocarditis, on the other hand, ite of primary infection is in the heart itself, the disease a more chronic course, and, in the great majority of the organism concerned is *Strep. viridans.*

e principal clinical features on which we are accus- d to base a diagnosis of subacute bacterial endo- tis are a valvular lesion or congenital defect, pyrexia, lic phenomena, splenomegaly, and a positive l-culture.

e Pre-existing Lesion.—The orthodox view, in the has been that subacute bacterial endocarditis y attacks a heart which has not previously been ged by rheumatic infection or is the seat of some nital abnormality, but it is remarkable that the xisting heart disease is almost always trivial, and patients with advanced heart disease appear to be une. For example, auricular fibrillation was present in only one of the 33 patients in our first series and in only 5 of Christie's (1948) 269 cases. Likewise none of our patients gave a history of heart-failure before infection. and in only 3 had there been any considerable impairment of capacity for effort; even these 3 carried on their normal activities. Of the remainder, 17 were in employment, and 11 women looked after their homes and families. The other 2 patients were still at school or college. In 13 of our patients there was a complaint of dyspnœa on unusual exertion but not during ordinary activity, while in 17 there had been no impairment of exercise tolerance and 8 of these did not even know that they had heart disease.

Of our 33 patients, 29 had rheumatic heart disease, but in 11 of them systolic murmurs only were present on admission. So rarely does one hear a typical crescendo presystolic murmur in bacterial endocarditis that its presence is sufficient to make one question the correctness of the diagnosis. Of our 12 rheumatic cases that came to necropsy in 2 only had the mitral disease produced stenosis. Aortic incompetence, on the other hand. was common, being diagnosed clinically in 16 of the 29 rheumatic cases. Coombs (1922–23) and Starling (1922–23). in their papers on chronic bacterial endocarditis amongst ex-Servicemen from the 1914–18 war, both remark on the rarity of a history of rheumatism and on the fact that often there was no evidence of previous cardiac damage.

Pyrexia.—Unexplained pyrexia in a patient with chronic heart disease is a pointer, and may be the only pointer, to the diagnosis of subacute bacterial endocarditis. It calls for immediate blood-culture. On the other hand, the absence of pyrexia does not exclude the possibility of infection, for in the more chronic type of case there may be long apyrexial periods. In one patient who was under my care in hospital some years ago, and in whom the diagnosis of subacute bacterial endocarditis was confirmed at necropsy, the temperature never rose above normal during the last nine weeks of life. The possible absence of pyrexia has been emphasised by both Coombs (1922–23) and Starling (1922–23).

Embolic Phenomena.—Major embolic phenomena may involve either the arteries of the limbs or those of the internal organs. In our series cerebral, splenic, renal, and coronary arteries were involved. Minute emboli lodging in the skin or subcutaneous tissues produce petechial hæmorrhages and Osler's nodes, whereas those lodging in the glomeruli of the kidney are one of the causes of hæmaturia in this disease.

Splenomegaly may be due either to infarction or to toxæmia. In the past most clinicians have taught that in congestive heart-failure the spleen is rarely palpable, and that in chronic valvular disease clinical enlargement of the spleen indicates infection. Fowler (1947), however, has brought forward evidence based on necropsy findings that the spleen may be considerably enlarged in heart-failure associated with rheumatic valvular disease. Taking 200 g. as the upper limit of normal and 300 g. as the lower limit of palpability, in 15% of his cases of congestive failure the spleen should theoretically have been palpable. though in only one case had it actually been felt during life.

Blood-culture.—Libman (1913), Osler (1908–09). Horder (1908–09), and the earlier workers generally were of opinion that in this condition blood-culture often proved negative. With the improved modern technique it is our experience that a positive blood-culture is obtained on the first attempt in the great majority of cases. In the 50 cases in our combined series the organism was isolated in the first blood-culture in 43, in the second in 5, in the fourth in one, and in the remaining case a positive culture had previously been obtained in another hospital. The technique is important and has been described by Penfold et al. (1940). In 5 cases in which, before the

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ed on a paper read at the Derby Medical Society on March 16, 918, with further follow-up of cases to June, 1948.

Notes and News

PROF. JÖRGEN SCHAUMANN

ONE of the kindliest possible gestures has lately been made in honour of Professor Schaumann; a committee of fifteen clinicians has published a golden book [1] in his honour, and has persuaded Prof. Henri Gougerot, of Paris, to contribute a foreword setting Schaumann's work in its correct perspective. The work was to have been issued to celebrate Schaumann's 60th birthday, "mais les événements de l'époque ne permettaient pas de donner une suite immédiate à ce projet." The book contains over sixty reprints of articles which have appeared either in *Acta Dermato-Venereologica* or in *Acta Medica Scandinavica*; it is, of course, chiefly concerned with benign lymphogranuloma (Schaumann's disease) and with kindred topics. While Schaumann must feel pleasure in this well-merited distinction, others can be grateful for such a useful compilation of the writings of many eminent authorities now republished to honour one of the most progressive thinkers in modern European medicine.

REPRODUCTION EXPLAINED TO CHILDREN

Dr. Edward F. Griffith's *The Truth about the Stork* [2] is a good idea which does not quite come off. It was a useful inspiration that made him set out to describe human reproduction in clear, open, and easy terms to children; but he seems to be in some doubt about the age of the child he is enlightening. The book begins with anatomy and physiology explained in words suitable for a child of seven, but accompanied by pictures and diagrams which would be better understood by a ten-year-old. Again, these more or less scientific diagrams and photographs are interspersed with comic drawings of rabbits, germs, and Noah's ark only suitable for tiny children. Mating is simply described, and so is normal birth, but it seems unnecessary to go on, in a book of this kind, to breech birth, cæsarean section, abortion and miscarriage, venereal disease, sterility, and birth-control. These are subjects for the adolescent, not the young child—unless for some reason he asks questions, or has been frightened by something he does not understand, such as a miscarriage in his own family. Dr. Griffith, on thinking things over, may be inclined in future editions to turn his one book into two.

University of London

Prof. J. R. Learmonth has been appointed Heath Clark lecturer for 1949. He has chosen as his subject the Contribution of Surgery to Preventive Medicine.

University of Sheffield

On Wednesday, Oct. 13, Lord Horder will deliver the opening sessional address of the faculty of medicine, in the Firth Hall of the university at 3 P.M. His subject will be the Vocation of Medicine.

University of Glasgow

Prof. Geoffrey Jefferson, F.R.S., will deliver the Macewen lecture in the chemistry building of the university on Friday, Oct. 1, at 3 P.M. He has chosen as his subject the Contribution of Sir William Macewen to Neurosurgery and Its Sequels.

University of Aberdeen

Dr. H. W. Fullerton has been appointed to the regius chair of medicine in succession to Prof. R. S. Aitken who has been appointed vice-chancellor of the University of Otago.

Dr. Fullerton took his M.A. at Aberdeen in 1925 and his M.B. in 1931. In 1937 he obtained his M.D. with honours and four years later took the M.R.C.P. After holding a house-appointment at Aberdeen Royal Infirmary he was awarded successively Rockefeller and Beit fellowships. He is at present lecturer in medicine at Aberdeen and an assistant physician at the Royal Infirmary. He has published papers on the nutritional anæmias.

Royal College of Physicians of London

On Tuesday and Thursday, Oct. 12 and 14, at 5 P.M. at the college, Pall Mall East, S.W.1, Dr. Desmond Curran will deliver the Croonian lectures. He is to speak on Prefrontal Leucotomy.

Royal Faculty of Physicians and Surgeons of

At a meeting of the faculty held on Sept. 6, with G. B. Fleming, the president, in the chair, the following admitted to the fellowship:

John Bell Cochran, John Ernest Awelrydd David, Mohanlal Desai, Thomas Jack, Patrick MacArthur, Ronald MacGillivray, William Greer Manderson, Ralph Adair Brown, Nathan Sher (qua physicians); John Thomson Buchan, Reginald Wheeler Busschau, Thomas Lightbody George Logan Clark, James Ross Hutchinson, Jacob Daniel Anandlal B. Kothari, William Sommerville Mack, Fred Inglis MacLeod, Aaron Meyer Porter, William Rankin, C Slight, William Barr Stirling, Alfred Edward Wilkinson, Brash Wright (qua surgeons).

King's College Hospital

Prof. Henry Cohen will deliver the inaugural the session at the medical school on Friday, Oct. 1, at

Westminster Hospital

The old students' annual dinner will be held this the Savoy Hotel on Saturday, Oct. 2, at 7.45 P.M. Arnold Stott will be in the chair.

Middlesex County Medical Society

At a meeting of this society to be held at 4 P.M. Friday, Sept. 17, at the North Middlesex County Silver Street, Edmonton, N.18, Mr. Ivor Lewis will address on Diagnosis.

International Scientific Film Congress

In connexion with this congress an exhibition of ill and photographs from teaching hospitals is to be 1, Wimpole Street, London, W.1, from Oct. 6 to 11 exhibition is designed to interest medical teachers.

West London Medico-Chirurgical Society

A dinner of this society will be held on Friday, Oct. the South Kensington Hotel, 41, Queen's Gate Terrace, at 7.30 P.M. At 8.30 P.M. Dr. W. S. C. Copeman wi presidential address on West London Worthies, a

British Hospitals Contributory Schemes

The final conference and annual general meeting association will be held at the Majestic Hotel, F from Sept. 30 to Oct. 3. Mr. Aneurin Bevan will be the of honour at the dinner on Oct. 1, and the concluding of the meeting will be to receive a report for the new which it is proposed to establish.

Chadwick Lectures

The autumn programme of the Chadwick Trust lectures by Sir Arthur MacNalty on Advances in F Medicine during the War of 1939–45 (Nottingham College, Oct. 28, 4 P.M.), by Dr. Wyndham Lloyd Prevention of Tuberculosis with special reference to ment (Westminster Hospital medical school, S.W.1, 2.30 P.M.), and by Dr. Charles Seeley on Preventive and Clinical Medicine in relation to the Public He Mary's Hospital medical school, W.2, Dec. 2, 4.30 Further particulars may be had from the secretary of 204, Abbey House, Westminster, S.W.1.

CORRIGENDA.—*Industrial-health Courses at M* The reference to these courses in the Students' Guide was incomplete. Courses for the D.I.H. are held each Manchester University, which was the first to offer a course for this diploma.

In the list of centres for the distribution of strept (*Lancet*, Sept. 11, p. 428) the telephone number of Park Hospital should be Lee Green 1077.

Diary of the Week

SEPT. 19 TO 25

Monday, 20th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. Hedwig Kuhn (*Hammond, Indiana*): Eye in Industry.

Wednesday, 22nd

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Place, W.1
3 P.M. Dr. Paul Banzet (Paris): Surgical Treatment of Ulcers. (Bengué lecture.)

Friday, 24th

BIOCHEMICAL SOCIETY
11.30 A.M. (Department of Biochemistry, University of *Short papers.*

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[1] Livre D'Or en l'Honneur du Professeur Jörgen Schaumann. Stockholm, 1948.

[2] London: H. K. Lewis. 1948. Pp. 137. 6s.

vious occupations without any evidence that acity for exertion has deteriorated; one is not since there is no economic necessity for her to ne is receiving treatment for a reinfection; and ıbjectively deteriorated and are unfit for work. st 3 are the only patients in whom cardiac ent was progressive after the end of treatment. f them, in whom only an aortic lesion had been signs of mitral stenosis developed, and in the the cardiogram showed an increased tendency axis deviation. These changes suggest that in es, even after the infection has been controlled in the process of healing—a stenotic valvular ay develop or increase in severity; thereby an additional and progressively increasing n the heart.

PROGNOSIS

on of Infection.—The most important factor in s appears to be the duration of infection before it. In our first series, when symptoms had been for less than ten weeks before treatment was o patient died, whereas none with symptoms or thirty weeks or more recovered. A similar is apparent in the combined series (Christie ough the contrast is less striking. From these he importance of early diagnosis is obvious. The reatment is started, the greater is the prospect of

tunately at this stage of the disease diagnosis extremely difficult, for the initial symptoms of l endocarditis give little indication of the nature ıfection; in our cases the commonest presenting were lassitude, generalised "rheumatic" pains, developing in patients already under observation, ue illness resembling influenza. In 3 cases major accidents marked the onset of symptoms: f them a subarachnoid hæmorrhage was presum- e to rupture of a mycotic cerebral aneurysm; cond hæmoptysis from a pulmonary infarct led staken diagnosis of pulmonary tuberculosis; and hird visible hæmaturia and loin pain from a large ıfarct suggested a urinary calculus. Persistent g or pallor were the presenting symptoms in In the more chronic type of bacterial endocarditis d by Starling (1922–33) anæmia was a much more nt symptom, the average hæmoglobin value in s being only 55%, but in these cases infection bably been present for a longer time when the s first came under observation.

ralised "rheumatic" pains were a common symp- our patients. They were of sudden onset but , and were rarely confined to the joints but often l muscle masses in the limbs or trunk. Such pains to lead to a mistaken diagnosis of "rheumatism" of rheumatic fever.

—Christie (1948) states that "age was of doubtful stic significance, except in the group over 50." In mbined series there were 9 patients over 50, 3 m are still living. The higher mortality among er patients may be partly due to the fact that in he condition is more apt to escape recognition, the infection remains untreated for a longer time.

t-failure.—As I have already remarked, the sting heart lesion, whether rheumatic or con- , is usually trivial, and it is not until infection en present for a considerable time that heart- appears. When it is present it adds greatly to vity of the prognosis (see below).

ition.—Christie (1948) emphasises the importance state of nutrition as a factor in prognosis, and the r a high-calorie diet, as in other protracted fevers. gnificance of nutrition appears to be independent duration of infection or of the incidence of failure.

CAUSE OF DEATH

Of the 33 patients in our first series 15 died, 8 during or within a few days of the end of treatment, the other 7 between four and thirteen weeks after treatment. In the whole series of 269 cases (Christie 1948) there were 131 deaths.

In those who died during treatment infection was considered to be wholly responsible for death in one case and partly responsible in 4. In no case in which death took place after treatment was there any evidence that infection played a part in the fatal issue.

Heart-failure was directly responsible for death in 5 of our 15 fatal cases and was a contributory cause in 5 others. Heart-failure usually developed when considerable cardiac enlargement was present, and there was a definite relation between (1) heart size and death-rate, and (2) heart size and duration of infection before treatment. Patients with large hearts generally gave a history of symptoms of infection lasting over many weeks whereas those without cardiac enlargement had been ill a shorter time. This direct relation between the duration of the bacterial endocarditis and the heart size suggests that cardiac damage due to the infection plays an important part in producing cardiac enlargement and heart-failure

Admittedly, various degrees of cardiac enlargement were present before infection, but the high degree of cardiac efficiency in most of our patients before infection suggests that their cardiac lesions were comparatively trivial, and that most of the cardiac damage was due to the subsequent infection.

Recovery was the exception in those who developed failure and the rule in those who did not. At the onset the failure was usually left-sided. Both myocardial and valvular damage due to the infection were factors in producing failure, but the mechanical stress from valvular lesions probably played the more important part.

Major vascular accidents, cerebral hæmorrhage in 2 cases and pulmonary embolism in one, were the cause of death in 3 of our cases. In one of these the fatal hæmorrhage appeared to be attributable to cerebral embolism which had occurred twelve months earlier.

Renal complications were considered to be partly responsible for death in 4 of our patients, 3 of whom died before the end of treatment.

PREDISPOSITION

In our first series there were 11 men and 22 women, and it is remarkable that in 7 of the women infection developed during pregnancy. The first 2 of these, in whom infection had been present for a considerable period before treatment was begun, both died; the other 5 were treated early and did well in spite of major vascular accidents in 2 and heart-failure in one. In one case a macerated fœtus was expelled a few days before the beginning of treatment, the other six children are well. Thus, provided the infection is promptly detected and adequately treated, the prognosis is good for both mother and child; and since, owing to the association of heart disease with pregnancy, these patients are usually under supervision at the time infection occurs, there is every opportunity for early diagnosis.

This very high incidence of subacute bacterial endocarditis during pregnancy calls for explanation. It is true that, in my clinic, we are particularly interested in heart disease associated with pregnancy, and that the material passing through our maternity hospital is carefully screened from this point of view; but, even making allowance for this, we feel that some other predisposing factor must be involved, and that in this disease, as Coombs (1922–23) suggested, the soil may be even more important than the seed.

The high incidence in pregnant women recalls the high incidence of "endocarditis lenta" among Army patients came under our care, repeated blood-cultures had been negative we were able to isolate the organism.

To observe the response to penicillin it was important that only proved cases of subacute bacterial endocarditis should be treated. Hence, for this investigation, cases in which we failed to obtain a positive blood-culture were excluded from the series. While these observations were in progress, 4 such cases, which clinically were regarded as subacute bacterial endocarditis, were admitted to my wards. In 2 of these, in view of the gravity of the patient's condition, treatment with penicillin was started after only one blood-culture had been taken. Of these 4 patients 2 died, and in them the diagnosis of bacterial endocarditis was confirmed at necropsy; the other 2 recovered.

To sum up, therefore, in 52 proved cases of bacterial endocarditis, a positive blood-culture was obtained on the first attempt in 44, on the second in 5, and on the fourth in one, while in 2 cases blood-culture proved negative. There remain 2 cases in which the diagnosis seemed highly probable on clinical grounds but in which blood-culture was negative. If we accept these 2 as bacterial endocarditis, blood-culture was positive in 50 and negative in 4, in 2 of which only a single culture was taken.

Patent Ductus.—I cannot leave this aspect of the subject without referring to a group of cases of special interest, in which the underlying lesion is a patent ductus. In such cases, of which there were 2 in our series, both children, the embolic phenomena involve the pulmonary instead of the systemic circuit, producing recurrent pulmonary emboli. The importance of this group, as Gilchrist (1948) has shown, is that the infection can often be controlled by ligature of the ductus without penicillin, though in patients who are gravely ill a course of penicillin may diminish the surgical risk.

TREATMENT

Early in this investigation it became evident that the duration of treatment was of great importance. Of 52 patients (Christie 1948), all given 5 mega-units of penicillin, 83% relapsed or died infected when the treatment lasted only five days, compared with 50% of those who were given the same total quantity of penicillin in ten days, and 22% of those in whom the period of treatment was twenty days. Later it was found that a dose of 0·5 mega-unit daily for twenty-eight days was sufficient to control the infection in 90% of patients. This was the dose given in all but 3 of the patients in our first series who lived to complete treatment.

We have usually given penicillin by three-hourly intramuscular injection, and this has been well tolerated for long periods. In 5 cases we used a continuous intramuscular drip, changing the site every twenty-four hours; but in each case, after a few days, we were obliged to resort to injection owing to severe pain at the site of the drip and the development of pyrexia. In all these cases the penicillin was of the less purified type, and we have not tried this method with the more highly purified preparations now obtainable.

The progress during treatment in a typical successful case may be summarised as follows:

> The temperature falls to normal within a few days, but the pulse-rate takes much longer to settle. The patient should be confined to bed for three weeks after the end of treatment, though the temperature and pulse-rate are normal. Carefully graduated and cautiously applied bed exercises are then started, and about ten days later the patient is allowed up for a short time. Great care is necessary during the early period of rehabilitation following successful treatment, however well the patient may appear to be when resting in bed. In fact we regard gradual rehabilitation in this disease as no less important than in myocardial infarction, undue haste being likely to lead to heart-failure.

Though infection can usually be controlled by a single course of treatment lasting only twenty-eight days, it takes much longer for the erythrocyte-sedime rate (E.S.R.), the anæmia, and the weight to ret normal. In our successful cases the E.S.R. did not normal until about five weeks after the end of treat There was often little rise in the hæmoglobin pe during treatment, but subsequently steady improv took place and a normal level was attained, transfusion, about three months after the end of ment; a gain in weight continued up to nine after treatment. In 8 of our successful cases th in weight averaged 23 lb.

Convalescence in these patients is slow and careful management. In our cases the average hospital was fourteen weeks; full activity wa resumed sooner than six months after the e treatment.

In cases in which the infecting organism is resistant to penicillin, Christie (1948) has suggested 2 mega-units daily should be given for six or eight of only four weeks, but we have not yet made observations to assess the efficacy of this dosage.

In one of the patients in our second series in the organism was known to be highly resistant larger doses were given; but, though these tem controlled the infection, a relapse occurred on occasion when the penicillin was discontinued.

> This patient had been treated elsewhere with the routine course of 0·5 mega-unit for twenty-eight day had not responded. In his second course of treatment, lasted eighty days, we started with 1 mega-unit dai subsequently increased this to 3 and later to 8 mega It was only on 8 mega-units that blood-culture negative. After relapse, a third course was given, of 12 mega-units daily for twenty-nine days. This c the infection, but four days after the completion of thi the patient again relapsed, and died two months late man received a total of 720 mega-units in six months.

In several of our cases, though the temperature h normal after treatment had begun, it rose again a beginning of the second week, and an inte pyrexia persisted until the penicillin therapy wa continued, when, in every case, the temperature normal. At first we were inclined to suspect t pyrexia indicated failure to control the infection, therefore doubled the dose of penicillin, but, ins falling, the temperature then rose higher. These o tions led us to conclude that, when the temperatu to normal in the first week, a subsequent rise i second week is a drug fever.

The only other toxic manifestations of penicilli our series were urticarial rashes in 2 cases and thr cytopenia in 2 others.

RESULTS

Of the 33 patients in our first series 15 died and 18 alive. Of those alive 15 are free from infection two or more after the end of treatment; one is at work has not been re-examined; one has recently recei course of treatment in a London hospital after rein with a different organism; and one has been read with a reinfection following a dental extraction perf without penicillin cover.

We feel hopeful therefore that most of these case prove to be permanently cured, for Christie's (figures show that 90% of relapses occur within a of the end of treatment. In our first series, in treated with a full course of 0·5 mega-unit for tw eight days there were 2 reinfections (see above) b relapses. In our second series, 3 patients did not re to penicillin, and there have been 2 relapses. Of patients who relapsed one died infected; and in other blood-cultures were negative for fifteen before death from heart-failure.

The degree of recovery can be gauged from the that, of our 18 patients who survived, 13 have res

MOPHILUS INFLUENZÆ MENINGITIS TREATED WITH STREPTOMYCIN

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TIL recently *Hæmophilus influenzæ* meningitis was ly fatal. Duncan and Webb (1934) found only 27 eries reported, 70% of them being in patients over ge of 2 years. A slight improvement followed the duction of sulphonamides and Fothergill's horse n, but results remained unsatisfactory. The first advance was Alexander's combined therapy with adiazine and specific anti-influenza-B rabbit serum. g this method she reported 68 recoveries out of ases (Alexander 1944), Smith et al. (1946) 24 eries out of 27, Beck and Janney (1947) 19 out , and Turner (1945) 10 out of 20.

e introduction of streptomycin was a further nce. The National Research Council (1946) reported ecoveries out of 100 cases, but some of these had ived combined therapy; Weinstein (1946) 7 out of 9; Alexander et al. (1946) 18 out of 21, 3 of whom not controlled by streptomycin and were given it serum and sulphonamides as well.

enicillin in conjunction with sulphonamides has also used, particularly in this country. The largest s so treated is that of Zinnemann (1946) who reported coveries out of 15 cases. I record here the results 2 cases transferred to the London Hospital for treatit with streptomycin. In 10 of them penicillin or honamides had been administered before admission; these drugs had not controlled the infection and *nfluenzæ* was still present in the cerebrospinal fluid F.) or blood.

osage and Treatment.—A routine of treatment was owed in conformity with the recommendations of Medical Research Council committee for streptocin trials in non-tuberculous conditions. All the ients received about 20 mg. of streptomycin per body-weight daily, divided into six intramuscular injections, together with a daily intrathecal injection of 25–100 mg. in 5 ml. of saline, the dose varying with the age of the patient and the severity of the disease. Treatment by both routes was continued until the C.S.F had been sterile for at least a week. No other specific treatment was given unless there was no response to streptomycin. Blood-transfusions were given when indicated for anæmia. Feeding was by œsophageal tube if there was any disturbance of consciousness.

Streptomycin Levels.—The methods of titration of streptomycin in blood-serum and C.S.F. were in accordance with Medical Research Council's instructions (M.R.C. 47/241, May 8, 1947). In 2 cases the serum-streptomycin level was estimated. An hour after the intramuscular injection of 80 mg. the concentration was 8–16 units per ml., and four hours after injection 2–4 units. The C.S.F.-streptomycin levels estimated twenty-four hours after intrathecal injection are shown in table I. After the injection of 25–50 mg. the level was usually 8–16 units per ml., and after 100 mg. it was 32–64 units per ml.

Toxicity.—Streptomycin caused no toxic effects, and there were no reactions from intrathecal instillation. One child (case 8) appears to be moderately deaf after a nine-day course of streptomycin, but whether this resulted from the drug or the meningitis, or both, it is impossible to say.

Bacterial Sensitivity.—In estimating sensitivity of *H. influenzæ* to streptomycin two methods were used. At first the minimal inhibiting concentration of the drug in Fildes's broth was estimated. This was 1 unit per ml. in 2 cases, and 2 units in 1 case. It was soon recognised that the results obtained by this method varied considerably with the size of the inoculum and the constitution of the medium. Latterly two drops of a solution containing 100 units of streptomycin per ml. was placed in a cup in the agar plate, and the diameter of the surrounding zone of inhibition was measured. This was done in the remaining 8 cases from which an organism was grown, and the zone of inhibition in these was 15–23 mm. in diameter.

Sensitivity tests were repeated whenever organisms reappeared in the C.S.F. In 3 cases that relapsed the

TABLE I—RESULTS OF TREATMENT OF *H. influenzæ* MENINGITIS WITH STREPTOMYCIN

Sex	Age (yr.)	Days ill before start of streptomycin	Intramuscular streptomycin (mg. daily × no. of days)	Intrathecal streptomycin (mg. daily × no. of days)	Ave. range of C.S.F.-streptomycin level (u./ml.)	C.S.F.-sugar (mg./ml.)	C.S.F.-culture (no. of days† positive)	Sensitivity of organism	Blood-culture	Clinical severity	Result
M	$^{9}/_{12}$	19	500 × 10	25 × 8	4–8	..	+ (1)	<2 µ per ml.	..	Mod.	Died
M	$^{9}/_{12}$	31	600 × 7	100 × 7	32–64	35	–	–	–	Mod.	Mental defect
F	$^{9}/_{12}$	21	500 × 28‡	50 × 2 25 × 12	16–32	30	+ (3)	21 mm.	Con.	Mod.	Good
F	1	10	400 × 8	50 × 8	2–4	..	+ (1)	Sens.	+	Mod.	Good
F	1	8	500 × 14	50 × 11	8	30	+ (1)	15 mm.	+	Mod.	Good
F	1	15 Rel.	400 × 8 400 × 11	50 × 8 100 × 5 50 × 6	8 32–64	.. ..	+ (1) + (1)	23 mm. 15 mm.	+ +	Mod.	Good
F	1	12 Rel. Rel.	500 × 10 500 × 7 500 × 12	50 × 10 50 × 7 50 × 11	8–16 8 8–16	20 53 32	+ (1) + (1) + (3)	Sens. Sens. 20 mm.	+ – +	Sev.	Good
M	$1^{4}/_{12}$	5	500 × 9	50 × 9	2–8	..	+ (1)	Sens.	–	Mild	Good
M	$1^{5}/_{12}$	3 Rel.*	400 × 2 840 × 7†	(Table II)	(Table II)	(Table II)	+ (6) + (3)	<1 µ. per ml. > 400 µ per ml.	+ +	Sev.	Died
M	$1^{11}/_{12}$	4	600 × 10	50 × 10	8–16	..	–	..	+	Mild	Good
M	2	20 Rel.	500 × 10 500 × 13	50 × 10 50 × 10	8–16 16	33 55	+ (1) + (1)	22 mm. Sens.	+ Not done	Mod.	Good
M	$2^{9}/_{12}$	3	1000 × 1	150 × 1	2	..	+	<1 µ per ml.	–	Sev.	Died

l. = relapse. Con. = contaminated. * Relapse treated with sulphamezathine and penicillin (these drugs were also given with the streptomycin in the primary attack). † Including day of admission. ‡ Treated with combined therapy.

pensioners after the 1914–18 war. When I was medical registrar at the Manchester Royal Infirmary in 1920–23, this disease was so common among ex-Servicemen that I nicknamed it "pensioners' heart." I can recall on two occasions seeing three necropsies on a single morning.

In 1923 Coombs (1922–23) reported 30 cases of "endocarditis lenta" seen since the end of the first world war. He distinguishes "endocarditis lenta" from the more acute type of bacterial endocarditis by the fact that it runs a course of months or years (one of his patients lived for over three years), that there is little or no fever, and that necropsy reveals anatomical evidence of stubborn opposition to the infection.

Of his patients 29 were males. A few acute cases in women, running a course not exceeding three months, were seen at the same time, but there was only one woman in the more chronic group. Of the 29 males 22 had served in the army, and 80% of these had been infantrymen or gunners with an average period of service of more than three years, mostly in France. Coombs says they were "men of fine physique and morale, men who joined the army early, served with all their might, and exerted themselves to the utmost limit of their physical powers." By contrast he did not encounter a single case among men of indifferent physique, whose service had been at the base and elsewhere, at home or overseas. He concludes that "so constant is the relation between physical fitness and strenuous exertion on the one hand, and proneness to endocardial infection on the other that a belief in the causal relation between the two can hardly be avoided." He suggests that excessive fatigue from the strenuous exertion to which these men had been subjected may have predisposed the body to infection. Possibly some similar predisposing factor may explain the high incidence of the disease during pregnancy. If this be so, it may provide a clue to the line of investigation we should pursue in searching for prophylactic measures.

The increased incidence and the more chronic nature of the disease among ex-Servicemen is emphasised by Wauchope (1925), who reviewed 125 cases of subacute and chronic bacterial endocarditis which came to necropsy at the London Hospital in 1907–24, and 70 cases, in 37 of which a positive blood-culture was obtained, admitted to hospital in 1911–23 in which no necropsy was performed. The number of male patients seen in 1922 was greatly in excess of that in previous years, whereas there was no corresponding increase in female cases. The increased incidence was due entirely to ex-Service cases. The sudden increase in 1921–22 is explained by the fact that before 1921 many Service patients were still in the army and treated in military hospitals. The reversion to the pre-war incidence in 1923 was sudden. Neither Coombs (1922–23), Starling (1922–23), nor Wauchope (1925) offers any explanation of the fact that the disease in ex-Servicemen generally runs a more chronic course than in civilians.

The same was true in Germany. Curschmann (1922) reported that at the Rostock Clinic the average number of fatal cases of subacute bacterial endocarditis in the three five-year periods between 1900 and 1915 was 8. In 1916–20 it rose to 15, and in 1921 there were 12 cases, an increase of more than 700% over the peace-time incidence. It is significant that after the 1939–45 war there was no corresponding exacerbation of "endocarditis lenta." This was a war of movement as contrasted with the static conditions of trench warfare in 1914–18. Chronic infections such as "trench foot" were less prevalent, and verminous infestation had been largely eliminated.

"Endocarditis lenta," as seen in ex-Servicemen of the 1914–18 war, presents some interesting points of contrast to the type of subacute bacterial endocarditis we see today. Its course was more chronic, the febrile disturbance was less pronounced, and often there was no rheumatic history nor evidence of any pre valvular or congenital lesion. These features suggest the infection had attacked a previously healthy and was not superimposed on a pre-existing lesion. makes one wonder whether, in view of the trivial n of the pre-existing heart disease in some, at least, of subacute cases, the supposedly "rheumatic" lesion not in reality have been produced by *Strep.* v rather than by previous rheumatic infection. hypothesis is supported by the fact that the infection of the mitral valve generally leads to but mitral stenosis is rare in subacute bacterial carditis, being present in only 2 of our 12 sup "rheumatic" cases which came to necropsy.

SUMMARY

A favourable response to penicillin may b expected in about half the patients with su bacterial endocarditis; but by earlier diagnosis we be able to improve on that figure.

Early diagnosis is often difficult, and I suggest that every patient with unexplained pyrexia, especially there be an associated heart lesion, a blood-culture be taken without delay.

The longer the infection is allowed to run on, greater the damage to the heart, and consequen greater the risk of heart-failure, which is the p cause of death.

There is a second reason why early diagnosis important. The pre-existing heart lesion is trivial and, if only we can bring these patients treatment before the infection has had time to p further damage, we may reasonably hope to render of them fit to resume their former occupations.

Unfortunately, in some cases, a progressive stenosis develops, in the course of healing; in cure of the infection appears to be directly r for the aggravation of the valvular lesion. At we have no means of dealing with this complication, perhaps our surgical colleagues may be able to help.

The high incidence of bacterial endocarditis pregnancy may prove to be a clue to the line of in tion we should pursue in searching for pre measures to combat this disease.

The discovery of penicillin has opened a new ch the story of bacterial endocarditis. There are chapters waiting to be written.

I am indebted to Dr. Morgan Jones, Dr. R. W. Fair and my other colleagues who have participated in investigation.

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"... *In the supreme question* which faces our gene physics and chemistry and engineering have no a for us. They are ethically neutral. They are preoc with physical matter. They can give us more horsep only the naïve, however, will claim that horsepowe develop within itself the means by which our m technologies can be brought under control. They ca more men to better health and longer life; but they little relationship to the problem of discovering a n of human purposes, or to the art of human relations, the winning of social and moral wisdom, upon which and successful government depend."—R. B. Fo Rockefeller Foundation Review for 1947, p. 9.

g. per 100 ml. On May 29 the pupils were normal. une 7 there was no neck rigidity and the patient was ng normally. When last seen, on July 28, 1948, she ared to be normal.

is was a moderately severe case probably cured streptomycin. The course of treatment was pro- ed and combined therapy was instituted, because a -negative bacillus was persistently found in the ed deposit of the C.S.F., though the culture was le. This organism subsequently proved to be a contaminant.

se 4.—A girl, aged 1 year, had become feverish and ll on Dec. 20, 1947, and had been admitted to hospital Dec. 23, with temperature 100·6°F, pulse-rate 160, rations 20 per min., injected fauces, and neck rigidity. C.S.F. had contained 480 cells per c.mm. and protein ng. per 100 ml., and on culture had grown *H. influenzæ*. ad been given sulphadiazine 1·5 g. daily for seven days penicillin 20,000 units three-hourly intramuscularly for days, 100,000 units three-hourly for another two days, 20,000 units intrathecally twice.

Dec. 30 she was transferred to the London Hospital, temperature 101°F, pulse-rate 160 and respirations r min., throat injected, nasal catarrh, well-marked neck ity. A throat swab and a blood-culture showed *H. enzæ* present. Hb 58%, white-cell count 16,400 per . (polymorphs 56%). C.S.F. contained 600 cells per . and protein 50 mg. per 100 ml., and on culture grew *fluenzæ* (1) sensitive to streptomycin.

atment.—Streptomycin 400 mg. intramuscularly daily 50 mg. intrathecally daily from Dec. 30, 1947, to Jan. 6, . The average range of the C.S.F.-streptomycin level 2–4 units per ml.

gress.—On Dec. 31, 1947, there was a remarkable ovement, the patient crawling about her cot. She had t neck rigidity, was afebrile after four days, and made eventful recovery. On Jan. 7, 1948, the C.S.F. contained mphocytes per c.mm. and protein 120 mg. per 100 ml. llow-up examination in August, 1948, showed her to be nal.

his was a moderately severe early case which vered after a single course of streptomycin.

ase 5.—A girl, aged 1 year, had been vomiting and able, but without convulsions, on Feb. 1, 1948. On 5 she had been unable to move her legs, and had been n sulphamerazine to a total dosage of 2·25 g. On Feb. 8 had been admitted to hospital with her C.S.F. containing cells per c.mm. and gram-negative bacilli. She had given sulphathiazole 1·5 g. On Feb. 9 she had been sferred to the London Hospital, with temperature 101°F, e-rate 150 and respirations 40 per min. She did not ar very ill and was mentally alert. She had slight rigidity, swelling of the right leg, especially over the le-joint; limitation of movement of the left hip, with lling in the inguinal region; and pitting œdema of both A throat swab and blood-culture both showed *H. uenzæ* present. Hb 67%, white-cell count 25,000 per m. (polymorphs 50%). Radiography of chest, pelvis, ankle showed no abnormality. Lumbar puncture duced purulent C.S.F. containing protein 80 mg. and ar 30 mg. per 100 ml. Culture produced *H. influenzæ* sensitive to a ring 15 mm. in diameter.

reatment.—Streptomycin 500 mg. intramuscularly daily n Feb. 9 to 23, and 50 mg. intrathecally daily from . 9 to 19. Both legs were immobilised in extension. average C.S.F.-streptomycin level was 8 units per ml.

rogress.—On Feb. 10, aspiration of the right ankle-joint duced a few drops of very thick pus containing gram- ative bacteria. A culture proved sterile. By Feb. 18 re was steady slow improvement, the patient being afebrile having no neck rigidity. On Feb. 25 there was an cess of the left thigh at the site of an intramuscular ction. *Staph. pyogenes* was grown from the pus. The F. was repeatedly sterile. On Feb. 19 the C.S.F. con- ned 41 cells per c.mm., protein 50 mg. and sugar mg. per 100 ml. Otherwise recovery was uneventful, l at follow-up in August the child was normal.

This was a moderately severe case, with purulent hritis of the left hip and right ankle, which recovered er a single course of streptomycin.

Case 6.—A girl, aged 1 year, had developed nasal catarrh and become drowsy and listless on Dec. 16, 1947, and had been admitted to hospital on Dec. 21 with left basal pneumonia. She had been given sulphamezathine, to a total dosage of 16 g. Her temperature had subsided at first but had risen again on Dec. 25. Chemotherapy had been discontinued on Dec. 26. On Dec. 27 she had had neck rigidity. From Dec. 28 penicillin 30,000 units four-hourly to a total of 520,000 units was given intramuscularly. On Dec. 29 her C.S.F. had contained 279 cells per c.mm. and protein 40 mg. per 100 ml., and on culture had produced *H. influenzæ*. She had then been given sulphadiazine 3 g. On Dec. 31 she was transferred to the London Hospital.

On admission her temperature was 103°F, pulse-rate 140 and respirations 30 per min. She was drowsy, with some clouding of consciousness, but was easily roused. Both ear drums were injected. The liver and spleen were just palpable. Neck rigidity was well marked. Abdominal reflexes were absent. Hb 60%, white-cell count 20,500 per c.mm. (polymorphs 48%). Blood-culture gave *H. influenzæ*, sensitive to a ring 23 mm. in diameter. C.S.F. contained 245 cells per c.mm. and protein 40 mg. per 100 ml., and on culture grew *H. influenzæ* (1).

Treatment.—Streptomycin 400 mg. intramuscularly daily and 50 mg. intrathecally daily from Dec. 31 to Jan. 8, 1948. The C.S.F.-streptomycin level was 8 units per ml.

Progress.—There was steady clinical improvement, but fever (100–102°F) persisted until Jan. 7, 1948, after which it fell to 99°F. On Jan. 8 the C.S.F. contained 60 cells per c.mm. and protein 90 mg. per 100 ml. Neck rigidity was still present on Jan. 10. On Jan. 12 the temperature was 103°F and the patient was restless and fretful, with more neck rigidity. C.S.F. contained 580 cells per c.mm. and protein 70 mg. per 100 ml., and on culture grew *H. influenzæ* (1), sensitive to a ring 15 mm. in diameter. Blood-culture proved sterile.

Further Treatment.—Streptomycin 400 mg. intramuscularly daily from Jan. 12 to 22, 100 mg. intrathecally daily from Jan. 12 to 16, and 50 mg. intrathecally daily from Jan. 17 to 22. The C.S.F.-streptomycin level was 32–64 units per ml.

Further Progress.—Steady improvement followed, temperature falling to 99°F by next day and remaining at this level, except for occasional spikes to 100°F, until Jan. 23, when it returned to normal. On Jan. 22 there was no neck rigidity, and the C.S.F. contained 72 cells per c.mm. and protein 120 mg. per 100 ml. The patient made an uneventful recovery, and at follow-up in August, 1948, appeared normal.

This was a moderately severe case, which relapsed after a full course of streptomycin, but recovered after a second course.

Case 7.—A girl, aged 1 year, had vomited, shivered, and for a time could not be roused, on April 18, 1948. On April 20 she had been admitted to hospital very ill and dyspnœic, and diagnosed as acute follicular tonsillitis and bronchopneumonia. She had been given penicillin 10,000 units intramuscularly six-hourly from April 20 to 25; sulphonamides total dosage 10 g. from April 20 to 27. A radiogram of her chest had shown nothing abnormal. She had remained febrile, but her condition had improved. On April 30 she had relapsed, with slight neck rigidity. Lumbar puncture had produced turbid C.S.F., and a stained film of the deposit showed organisms resembling *H. influenzæ*. The patient was thereupon transferred to the London Hospital.

On Admission.—Temperature 98°F, pulse-rate 100 and respirations 34 per min. She looked ill and grey, crying monotonously when roused, but rapidly sinking back into a semicomatose state, grinding her teeth, and with muscular twitchings of the face. Neck rigidity was well marked. The ear drums were injected. Hb 70%, white-cell count 37,800 per c.mm. (polymorphs 73%). Blood-culture produced *H. influenzæ*. C.S.F. contained 1280 cells per c.mm., protein 120 mg. and sugar 20 mg. per 100 ml., and on culture produced *H. influenzæ* (1) sensitive to streptomycin.

Treatment.—Streptomycin 500 mg. intramuscularly daily from April 30 to May 10, and 50 mg. intrathecally daily from April 30 to May 9. The C.S.F.-streptomycin level had an average range of 8–16 units per ml.

Progress.—On May 10 there was little if any clinical improvement (for temperature see fig. 1). Streptomycin was discontinued after the C.S.F. had been sterile for nine days. On May 11 a few crepitations were heard at the organism remained sensitive. In a fourth (case 9) the organism persisted in the C.S.F., and daily estimations showed a rapid diminution of sensitivity. Originally the strain was inhibited by 1 unit of streptomycin, but forty-eight hours later it grew in 400 units. At necropsy four weeks later it was still insensitive.

Results.—Of 8 patients treated with streptomycin alone 2 died and 6 recovered. Of 3 patients treated with combined therapy 1 died. Case 2 is excluded because no organism was grown from the C.S.F. or from the blood before streptomycin was given. Thus of 11 patients 3 died, giving a case-mortality of 27%. The C.S.F. became sterile within twenty-four hours of the start of streptomycin treatment in 7 cases out of 9.

CASE-RECORDS

On admission, besides a complete physical examination, every child underwent the following investigations as a routine: lumbar puncture, throat swab, blood-count, examination of urine, blood-culture, and radiography of chest. Positive findings alone are recorded. The C.S.F. was examined daily. The number of days during which *H. influenzæ* was cultured after the start of streptomycin treatment is noted in parentheses. This includes the one C.S.F. culture made from material taken immediately before the start of streptomycin treatment. The organism grown from C.S.F. was typed in every case and found to be Pittman's type B.

Case 1.—A boy, aged 9 months, had become irritable in the morning of March 12, 1947, vomited at midday, and then had a convulsion lasting an hour. For the next ten days he had been quiet and rather listless. He had been admitted to hospital on March 22 with well-marked neck rigidity. Lumbar puncture (March 20) produced turbid C.S.F. which on culture grew *H. influenzæ.* Penicillin 200,000 units intramuscularly three-hourly and sulphathiazole 1 g. four-hourly had been given from March 22 to 28 and then discontinued because the temperature had been normal for three days. The patient had relapsed in the evening of March 28, and was transferred to the London Hospital on March 30.

On Admission.—Temperature 101°F, pulse-rate 140 per min. He did not look very ill. He followed objects with his eyes and grasped with his hands. There was well-marked head retraction and neck rigidity. The fontanelle was not tense. Pus was aspirated from an abscess in the thigh (? site of penicillin injections) and was sterile on culture. C.S.F. purulent; pressure 120 mm. H_2O; protein 600 mg. per 100 ml.; culture grew *H. influenzæ* (1), growth inhibited on Fildes's agar containing 2 units of streptomycin per ml. Hæmoglobin 58%, white cells 23,000 per c.mm. (polymorphs 48%).

Treatment.—Streptomycin intramuscularly 500 mg. daily from March 30 to April 8, and intrathecally 25 mg. daily from March 31 to April 7. The first three injections were intraventricular, because the C.S.F. flowed with difficulty on lumbar puncture. The C.S.F.-streptomycin level had an average range of 4–8 units per ml.

Progress.—The patient had continuous pyrexia over 100°F throughout the illness, with frequent vomiting. *April 2 and 3:* ventricular C.S.F. contained many pus cells and protein 1500 mg. per 100 ml.; culture proved sterile. *April 9:* gastro-enteritis. *April 12:* bilateral mastoid antrotomy; no pus found; swabs sterile. *April 14:* convulsion. *April 20:* passed a formed stool and seemed to be improving, but in the evening had a convulsion, with clonic movements and spasticity of the right side. *April 21:* grey and critically ill; right-sided fits continued; an operation was performed to exclude localised intracranial pus, and no pus was found; C.S.F. contained 25 cells per c.mm., and protein 50 mg. per 100 ml.; culture proved sterile. *April 22:* the patient died.

Necropsy Findings.—Fibrous matting of leptomeninges at the base of the brain; a ragged cavity 2 cm. in diameter in the left frontal lobe, containing fragments of blood-clot, lined by soft ragged sloughing tissue and communicating with the left lateral ventricle: moderate dilatation of all ventricles; extremely fatty liver. Microscopically there was no evidence of active meningitis over the brain or cord, and no inflammatory reaction in the wall of the cavity in the left frontal lobe.

This was a moderately severe case which was by streptomycin but subsequently developed enteritis. The cause of the cavity in the frontal remains obscure. A possible explanation is that streptomycin was injected at this site.

Case 2.—A boy, aged 9 months, had begun to be f on May 2, 1947, followed two days later by a fit, with of the right side of the body, staring eyes, and and retraction of the tongue. Subsequently, whenever child cried, his right hand had twitched. On May 13 been admitted to hospital, with temperature 104°F, rate 140, respirations 36 per min., and neck rigidity fontanelle had not been tense. C.S.F. had been purulent tained gram-negative organisms resembling *H. influenzæ.* patient had been given 'Sulphamezathine' from May 11 a total of 24 g.; and penicillin 25,000 units intrathecally from May 16 to 26; 50,000 units intrathecally on al days from May 26 to June 2; and 6000 units by three-hourly from May 14 to June 2. During this there had been a persistent fever and steady de in his clinical condition. On May 31, *H. influenzæ* had been present in the C.S.F., and on June 2 the patient transferred to the London Hospital.

On Admission.—Temperature 101°F, pulse-rate 140, well-marked head retraction and opisthotonos; clenched over thumbs; legs hyperextended. The appeared mentally impaired. The fundi showed pallor of both discs. The fontanelle was not tense rigidity and generalised spasticity, with tremor of the and ankle clonus, were present. The abdominal refle absent, and all tendon-reflexes exaggerated. W count 17,000 per c.mm. (polymorphs 70%). C.S.F.: p 150 mm. H_2O; 345 cells per c.mm.; protein 110 mg sugar 35 mg. per 100 ml.; culture sterile. Blood also proved sterile.

Treatment.—Streptomycin 600 mg. intramuscularly and 100 mg. intrathecally daily from June 2 to 8.

Progress.—The patient was afebrile after three C.S.F. (June 8) 120 cells per c.mm. and protein 100 mg. 100 ml.; it subsequently became normal. level in C.S.F. 32–64 units per ml. There was no ment in the neurological condition, though general was satisfactory, and when discharged (Aug. 8, 1947) patient was mentally defective, blind with optic and had generalised spasticity. On Aug. 8, 1948, the was still alive, and his condition unchanged.

This was a subacute case deteriorating wh penicillin and sulphamezathine, though the may have been controlled. The C.S.F. was sterile on when streptomycin therapy was begun.

Case 3.—A girl, aged 9 months, had fallen from perambulator on April 1, 1947, but had not lost On April 21 she had been feverish, vomited repeatedly, been admitted to hospital with neck rigidity and C.S.F., which grew *H. influenzæ* on culture. She had given sulphonamides 3 g. daily for nine days, and p 20,000 units intramuscularly four-hourly for four days 10,000 units intrathecally once. On May 8 her cond had remained unchanged, and her C.S.F. contained 300 per c.mm. and protein 100 mg. per 100 ml. and *H. influenzæ* on culture. On May 13 the patient transferred to the London Hospital.

On admission the patient appeared pale and moderately with head retracted and neck rigid, temperature 10 pulse-rate 180 per min., right pupil dilated with no re to light. A blood-culture was contaminated. Whi count 12,200 per c.mm. (polymorphs 84%) C.S.F. cont 650 cells per c.mm., protein 140 mg. and sugar 30 mg 100 ml., and on culture grew *H. influenzæ* (3), sensiti a ring 21 mm. in diameter.

Treatment.—Streptomycin 480 mg. intramuscularly from May 13 to June 9, 50 mg. intrathecally daily from M May 13 to 15, and 25 mg. intrathecally daily from M to 26; penicillin 120,000 units intramuscularly daily May 22 to June 15, 5000 units intrathecally daily May 22 to 26; sulphamezathine 3 g. daily from Ma to June 15. The C.S.F.-streptomycin level was 10–32 per ml.

Progress.—The patient became afebrile on May 15 clinically improved by May 21. May 26: C.S.F. cont 8000 red cells and 140 white cells per c.mm., and p u—*H. influenzæ* MENINGITIS INSENSITIVE TO INCREAS- DOSES OF STREPTOMYCIN BUT RESPONDING TO COM- D THERAPY (CASE 9).

ate 47)	Intramuscular streptomycin (mg.)	Intrathecal streptomycin (mg.)	Cerebrospinal fluid					Intramuscular penicillin (units)	Sulphamezathine (g.)
			Streptomycin level (u./ml.)	Cells per c.mm.	Protein (mg./100 ml.)	Sugar (mg./100 ml.)	*H. influenzæ*		
': 2 A.M.	400	50	..	6000	120	..	+*	..	..
10 A.M.		25	1	26,000	50	..	+	..	..
: A.M.	400	25	1	13,000	50	53	+	..	..
P.M.		75	2	1000	30	64	+	..	..
): A.M.	840	65	4	400	40	72	+†	..	..
P.M.		50	..	..	..	..	..	..	..
): A.M.	840	100	2	7000	140	..	+	300,000	..
A.M.	840	100	8	3680	20	53	+	300,000	..
P.M.		100	16	1700	..	..	+	..	..
	840	..	4	Pus	50	60	+	300,000	4·5
	840	..	..	..	..	..	..	300,000	4·5
	840	..	8	208	30	..	–	300,000	4·5

sitive to 1 unit but grew in $^1/_2$ unit streptomycin per ml.
ensitive to 400 units streptomycin per ml.

lly. On May 25 he developed measles, and on May 27 ative laryngitis for which he underwent tracheotomy; died the same day. The C.S.F. had been sterile for ays before death.

opsy Findings.—Many small patches of fibrinopurulent te on the cerebral hemispheres produced, on culture, *fluenzæ* insensitive to streptomycin. A very recent ortem thrombus in the superior longitudinal sinus. us in ethmoid air-cells, nasal cavity, and maxillary Greyish-yellow mucopurulent membrane lining the above the true vocal cords excluding the epiglottis, ring on culture *Staph. pyogenes* and *Bact. coli.* Mottled ed areas of pneumonia throughout the lungs. No mality in the right knee-joint.

is was a case of severe infection, with multiple itis. The infecting organism became rapidly sitive to streptomycin despite big doses. Increas- large intrathecal doses were used when the C.S.F.- tomycin level (repeatedly estimated) remained low. illin and sulphonamides subsequently sterilised the , but death followed measles with suppurative igitis. Necropsy showed that pus on the cerebral spheres still contained *H. influenzæ.*

se 10.—A boy, aged 1 year 11 months, had had fever anorexia on Jan. 2, 1948, and pneumonia had been osed. He had been admitted to hospital on Jan. 4, neck rigidity. His C.S.F. had contained 1000 cells per , protein 40 mg. and sugar 60 mg. per 100 ml., and, lture, had grown *H. influenzæ.* The patient had been sulphadiazine to a total of 7·5 g. and penicillin 60,000 intramuscularly four-hourly until he was transferred to London Hospital on Jan. 6.

Admission.—Temperature 100°F, pulse-rate 130 and ations 24 per min. The patient was drowsy but con- s, with well-marked neck rigidity. A blood-culture *H. influenzæ.* The C.S.F. contained 334 cells per c.mm. protein 100 mg. per 100 ml. Culture proved sterile.

eatment.—Streptomycin 600 mg. intramuscularly daily 50 mg. intrathecally daily from Jan. 6 to 15. The -streptomycin level was 8–16 units per ml.

ogress.—There was steady improvement to complete very. By Jan. 13 there was no neck rigidity and the ent was afebrile. On Jan. 15 the C.S.F. contained 48 cells c.mm. and protein 80 mg. per 100 ml. At follow-up in ust he was normal.

his was a mild case, in which the C.S.F. was sterile r penicillin and sulphadiazine, but blood-culture was positive before streptomycin treatment.

Case 11.—A boy, aged 2 years, had vomited several times and become feverish and weak on his legs on May 4, 1948. Next day he had been admitted to hospital with temperature 101°F, pulse-rate 120 and respirations 25 per min., and looking pale, ill, and slightly cyanosed, with doubtful signs in the chest and doubtful neck rigidity. Bronchopneumonia had been diagnosed and treated with penicillin 20,000 units three-hourly and sulphamezathine 0·5 g. six-hourly. Temperature had fallen during the first five days but risen again on May 10 within a day of stopping treatment. On May 17 lumbar puncture had produced C.S.F. under pressure of 300 mm. H_2O, containing 1000 cells per c.mm. and protein 45 mg. per 100 ml. Penicillin 10,000 units intrathecally daily and 20,000 units three-hourly intramuscularly had been given for three days without improvement. On May 23 the infecting organism had been identified as *H. influenzæ.* On May 24 the patient was transferred to the London Hospital.

On Admission.—Temperature 100°F. Moderate neck rigidity. Blood-culture grew *H. influenzæ.* White-cell count 25,000 per c.mm. (polymorphs 75%). C.S.F. contained 960 cells per c.mm., protein 60 mg. and sugar 57 mg. per 100 ml., and on culture grew *H. influenzæ* (1), sensitive to a ring 22 mm. in diameter.

Treatment.—Streptomycin 500 mg. intramuscularly and 50 mg. intrathecally daily from May 24 to June 2. The C.S.F.-streptomycin level was 8–16 units per ml.

Progress.—On May 26 the patient became afebrile and began a rapid clinical improvement (fig. 2). On May 28 there was no neck rigidity, and he was playing. On June 1 the C.S.F. contained 12 cells per c.mm., protein 50 mg. and sugar 51 mg. per 100 ml. On June 5 the patient's temperature was 101°F, and he was fretful and crying, with watery nasal discharge, injected fauces, and neck rigidity. The C.S.F. contained 610 cells per c.mm., protein 200 mg. per 100 ml., and on culture grew *H. influenzæ* (1).

Further Treatment.—Streptomycin 500 mg. intramuscularly daily from June 5 to 17, and 50 mg. intrathecally from June 5 to 14. The C.S.F.-streptomycin level was 16 units per ml.

Further Progress.—Clinical improvement was noted on June 9, on June 12 there was no neck rigidity, and on June 13 the patient was afebrile. He made an uneventful recovery (see fig. 2), and at follow-up in August he was normal.

This was a moderately severe case which relapsed after apparent recovery and was cured by a second course of streptomycin.

Case 12.—A boy, aged 2 years 9 months, had developed anorexia, vomiting, increasing restlessness, and drowsiness on April 5, 1947, and frontal headache on April 7. At 10 P.M. on April 8 he was admitted to the London Hospital.

On Admission.—Temperature 102°F, pulse-rate 160 and respirations 22 per min. The patient was very ill and faintly cyanosed, lying with his eyes half-closed and head retracted. His fauces were injected. No abnormality was detected in the respiratory system. He was semicomatose, reacting to pin-prick but not to spoken commands. Neck rigidity was severe; flexion caused piercing screams. There was generalised hypotonia, with abdominal reflexes absent. The left plantar response was flexor, and the right extensor. Blood-

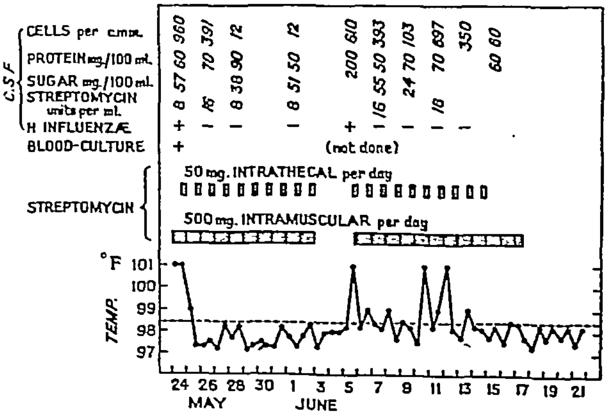

Fig. 2—Chart of mild case, showing apparently satisfactory response to streptomycin followed by relapse (case 11).

left base, and the patient was given sulphadiazine 1·5 g. daily for six days in view of the possible development of pneumonia. The C.S.F. contained 52 cells per c.mm., protein 40 mg. and sugar 50 mg. per 100 ml., and on culture proved sterile. On May 14 there was a sudden rise in temperature, and the C.S.F. contained 295 cells per c.mm., protein 40 mg., and sugar 30 mg. per 100 ml., and culture gave *H. influenzæ* (1). Blood-culture was sterile.

Further Treatment.—Streptomycin 500 mg. intramuscularly daily and 50 mg. intrathecally daily from May 13 to 19. The C.S.F.-streptomycin level was 8 units per ml.

Further Progress.—Some improvement followed. The patient was smiling and taking more interest. On May 19 there was no neck rigidity and no pyrexia. On May 21 there was pyrexia in the evening, and the C.S.F. contained 37 cells per c.mm., and protein 35 mg. per 100 ml., but culture proved sterile. On May 22 the C.S.F. contained 19,000 cells per c.mm., protein 120 mg. and sugar 32 mg. per 100 ml., and on culture produced *H. influenzæ* (3), sensitive to a ring 15 mm. in diameter. Blood-culture also proved positive.

Further Treatment.—Streptomycin 500 mg. intramuscularly daily from May 22 to June 2, and 50 mg. intrathecally daily from May 22 to June 1. On May 22 specific type-B *H. influenzæ* rabbit antiserum 50,000 units was given intravenously.

Further Progress.—Bilateral myringotomy was done on May 28, but no pus was found. On May 31 the patient was pulling herself up and playing. Lumbar puncture became increasingly difficult. The C.S.F. tended to be bloodstained and showed a rise in protein content to 200 mg. per 100 ml. on May 29. The possibility of a spinal block developing was considered, but in view of her clinical improvement it was decided to treat her conservatively, and streptomycin was discontinued. On June 3 the patient had an urticarial eruption; otherwise recovery was uneventful (see fig. 1), and at follow-up in August, she was normal.

This patient was severely ill, with drowsiness and protracted semicoma suggesting encephalitis. She relapsed twice after two full courses of streptomycin, but recovered after a third course combined with type-B *H. influenzæ* antiserum.

Case 8.—A boy, aged 16 months, whose sister had died in 1937 of *H. influenzæ* meningitis at the age of 13 months, had been visited on Dec. 13, 1947, in a day nursery by his father, who had noted that he was thin and pale, "had a vacant look," and gave no sign of recognition. On Dec. 17 the child had been admitted to hospital with neck rigidity. A lumbar puncture had produced turbid C.S.F. containing gram-negative bacilli, but sterile on culture. He had given sulphamezathine 4 g. and sulphadiazine 1·5 g. Dec. 18 he was transferred to the London Hospital.

On Admission.—Temperature 101°F, pulse-rate 138 respirations 36 per min. The patient lay quietly but easily roused. Neck rigidity was present. There was swelling of the right arm, which showed an increase of 1 in circumference around the elbow. Hb 71%, whi count 17,600 per c.mm. (polymorphs 57%). C.S.F. cont 12,700 cells per c.mm., and protein 40 mg. per 10 and on culture gave *H. influenzæ* (1).

Treatment.—Streptomycin 500 mg. intramuscularly and 50 mg. intrathecally daily from Dec. 19 to 27 C.S.F.-streptomycin level was 2–8 units per ml.

Progress.—On Dec. 22 there was clinical improvement no neck rigidity. On Dec. 23 the patient was af On Dec. 27 his right arm was no longer swollen, and C.S.F. contained 60 cells per c.mm. and protein 50 mg. 100 ml. At a follow-up in August, 1948, the patient very well, except that he seemed slightly deaf. He had yet begun to talk.

This was a mild case, with arthritis of the right el which responded well to streptomycin.

Case 9.—A boy, aged 17 months, had frequent at of projectile vomiting and became listless on April 1947. Next day he was semiconcious and was taken to h where lumbar puncture had produced turbid C.S.F. w on culture grew *H. influenzæ*. On April 26 the patient transferred to the London Hospital.

On Admission.—Temperature 102°F, pulse-rate 1 respirations 32 per min. The patient was drowsy, ill grey, but coöperative. The spleen was palpable. was moderate neck rigidity. A blood-culture was po Hb 65%, white-cell count 19,000 per c.mm. (polym 48%). C.S.F. contained 6000 cells per c.mm. and p 120 mg. per 100 ml., and on culture grew *H. influenzæ*.

Treatment.—Streptomycin 400 mg. intramuscularly from April 26 to 28, 840 mg. intramuscularly daily April 29 to May 5, and 75–200 mg. intrathecally daily April 26 to May 1; penicillin 50,000 units intramus four-hourly from April 30 to May 14; and sulphame 4·5 g. daily from May 2 to 5, and 3 g. daily from to 14 (see table II).

Progress.—On April 28 the intrathecal dosage of s mycin was increased because the C.S.F.-streptomycin remained low. On April 29 the patient was found to arthritis involving the right knee, right elbow, left and the interphalangeal joints of both big toes; 20 pus was aspirated from the knee, and on culture it *influenzæ*. Streptomycin 25 mg. was in into the knee-joint and into the left The legs were immobilised in extension April 30, because *H. influenzæ* was still cultured from the C.S.F., intramu penicillin therapy was started. On May patient was deteriorating, and intrat streptomycin was discontinued because infecting organism had become re Sulphamezathine therapy was started. May 10 the patient was much impro playing with toys, but still febrile. Pus the knee was sterile. On May 14, the c having been sterile for twelve days and taining 3 cells per c.mm. and protein 20 per 100 ml., chemotherapy was stopped. May 16 the patient had a relapse, vomiting and fretfulness, but no definite rigidity. A blood-culture was positive C.S.F. contained 3000 cells per c.mm. protein 50 mg. per 100 ml., and on cul grew *H. influenzæ* (2) insensitive to str mycin but slightly sensitive to penicillin.

Further Treatment.—Sulphamezathine daily; penicillin 50,000 units in muscularly four-hourly from May 16 28, 10,000 units intrathecally daily for days, and 5000 units intrathecally daily eight days from May 18 to 28.

Further Progress.—On May 21 the C contained 40 cells per c.mm. and protein mg. per 100 ml. There was continuous f over 100°F, but the patient began to imp

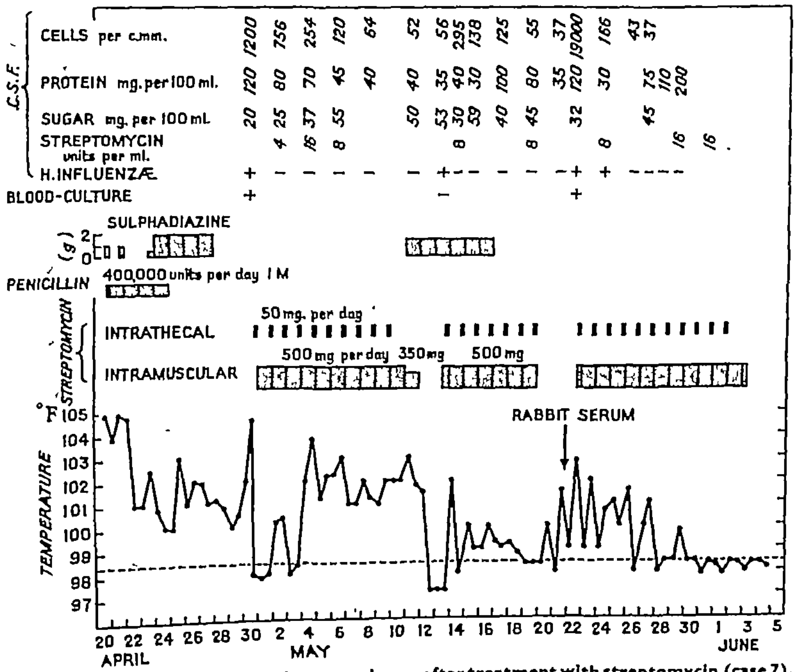

Fig. 1—Chart of severe case, showing two relapses after treatment with streptomycin (case 7).

ılphonamides. Subsequently there was a relapse
was controlled by the same treatment. Death
ue to a complicating suppurative laryngitis when
s.F. had been sterile for nine days, and there was
l evidence of improvement of the meningitis.
psy showed scattered areas of pus over the cerebral
heres from which *H. influenzæ* was grown. Such
ight well be responsible for relapses. Presumably
er cases such residual foci may be situated in the
joints, middle ears, or sinuses, and may be the
of a relapse with septicæmia and meningitis.
ps more attention should be directed to the
s, which may be involved in the initial infection
upper respiratory tract. Field and Rogers (1936)
ed a case of meningitis which they considered
lary to an infected sphenoidal sinus from which
fluenzæ was grown post mortem. Mucopus was
in the maxillary and ethmoid antra at necropsy
e 9; unfortunately it was not cultured. Presumably
nger these foci have been present the longer they
o resolve. This may explain why relapses occurred
es of relatively long duration before streptomycin
nent was started.

herefore appears that it is justifiable to discontinue
omycin when the C.S.F. has been sterile for at least
k in early moderately severe cases. Treatment
have to be prolonged, however, if the temperature
rsistently raised, if there has been a long illness
e the infection is controlled, if there is an active
of infection, or if the response to treatment is slow.
ly long courses of streptomycin may be avoided
mbining it with sulphonamides. Both drugs could
ed in the acute stage, after which a further course
ılphonamides may prove adequate in preventing
pse.

tomycin Resistance

exander (1947) has shown that the development of
istant strain of *H. influenzæ* is due to the elimination
ll sensitive organisms and to the survival of the
few insensitive forms that occur in every large
erial population. A few resistant organisms can be
n from nearly every case, but it is only in very
te infections that they succeed in establishing
selves. If this happens it usually follows shortly
the start of streptomycin therapy. Case 9 is an
nple of this type, the organism becoming resistant
orty-eight hours. There is no reason to suppose
dosage was inadequate, but it was remarkable that
C.S.F.-streptomycin levels remained persistently low
ite big intrathecal doses. No resistant strains
loped from any of the cases that relapsed. A sensi-
strain was grown from case 7 after nineteen days'
ptomycin therapy.

ombined therapy therefore seems to be indicated in
re infections, because a single chemotherapeutic
nt may destroy a large proportion of the organisms
leave sufficient numbers to maintain the infection.
second drug, less effective by itself, may play a
sive part by destroying these remaining organisms.
s is of paramount importance in severe *H. influenzæ*
ction, since there are no indications of when a resistant
in may emerge. Theoretically, combined therapy with
ptomycin, rabbit antiserum, and sulphonamides should
ve most effective if given at the onset, when the
nber of streptomycin-resistant organisms is still small.
abbit antiserum is not obtainable, a combination of
ptomycin, penicillin, and sulphonamides may prove
be the treatment of choice.

SUMMARY

treptomycin was given in 12 cases of *H. influenzæ*
ningitis. One case is excluded because there was no
teriological evidence of active infection on admission.
Of the remaining 11 patients 3 died, and in 1 of these the organism became resistant to streptomycin.

The clinical picture is described with a view to earlier diagnosis and the recognition of severe cases.

Streptomycin gave good results in the mild or moderately severe cases but was unsatisfactory in 3 severe cases.

In 3 cases a relapse followed a full course of streptomycin. Factors that might predispose to a relapse are discussed, with particular reference to the duration of treatment.

In view of the failure of streptomycin in severe cases and of the possible development of resistant strains, it is recommended that all cases should be treated with streptomycin and sulphonamides. If there is any reason to suspect a severe infection, either antiserum or penicillin should be given in addition.

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AN ARTIFICIAL HEART OR CARDIOPULMONARY MACHINE

PERFORMANCE IN ANIMALS

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IN experimental and clinical work which he began in 1935 Crafoord found it possible to suspend the flow of blood to all organs but the brain for a considerable time without damaging them. Thus, in 33 patients undergoing operation for patent ductus arteriosus he double-clamped the aorta for 10–27 min.—in most cases more than 20 min.—just below the point where the left subclavian artery arises, without causing any subsequent disturbances in the patients' internal organs.

In view of this experience Crafoord thought it possible to achieve a bloodless approach to the inside of the heart, arresting the circulation of blood but maintaining an adequate flow through the brain with a cardiopulmonary machine. In 1946 Crafoord and Andersson constructed an artificial heart, which I have studied in experiments on animals.[1] Thus in a dog I have clamped both superior and inferior venæ cavæ for 33 min., rendering the heart bloodless but maintaining the blood-flow to the brain alone with the cardiopulmonary machine. The dog survived with no sign of organic damage and became father to eleven puppies.

Though all the other organs will tolerate an arrest of the circulation for half an hour, a few minutes' anoxia damages the brain. During a bloodless intracardiac culture proved sterile. The C.S.F., under a pressure of 300 mm. H_2O, contained 17,000 cells per c.mm., and grew *H. influenzæ* on culture.

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[1] Björk, V. O. (1948) *Acta chir. scand.* suppl. 137.

Treatment and Progress.—Streptomycin $^1/_6$ g. intramuscularly four-hourly, and 50 mg. intrathecally immediately. Twelve hours later (April 9) there was an abrupt onset of choking, with bubbling noises in the pharynx; this cleared after half an hour. Temperature 104°F, pulse-rate 160 per min. The patient was critically ill, and his colour ashen grey. Signs of consolidation in the left upper lobe were confirmed by radiography. Lumbar puncture was done at 6 P.M. and streptomycin 100 mg. was given intrathecally. The C.S.F.-streptomycin level was 2 units per ml. Gram-negative coccobacilli were present in a film of C.S.F. The patient died at 11 P.M.

Necropsy Findings.—Purulent meningitis; ill-defined areas of peribronchial consolidation in the lungs; stomach contents and greenish-yellow mucus filling trachea and bronchi. In a smear from meningeal pus gram-negative organisms were seen, but a culture was contaminated. Ventricular fluid contained gram-negative organisms. Culture from the lungs gave *Staph. pyogenes.*

This was a fulminating infection with meningitis and pneumonia, and the patient died twenty-five hours after streptomycin therapy had been started.

DISCUSSION

Though probably less common in this country than in the United States (Mutch 1941), *H. influenzæ* infection is an important cause of suppurative meningitis, particularly in children under the age of 2 years. In the present series 12 cases were admitted in fifteen months. All were transferred, however, from hospitals covering a wide area. A more normal rate of admission is indicated by a review of 10 cases admitted to the London Hospital in 1927–36 (Williams and Tallerman 1937).

No attempt is made to describe the clinical picture in detail, but a few points are emphasised that may help in early diagnosis, since this is essential if good results are to be achieved.

The diagnosis is most difficult in young infants, the age at which the prognosis is worst (Alexander 1943). Not infrequently a mild upper respiratory infection precedes an abrupt febrile onset of vomiting, irritability, convulsions, or drowsiness. Physical signs may be absent in the early stages. Increased tension of the fontanelle generally appears earlier than neck rigidity. Slight disturbances of consciousness may develop, often no more than a vacant glazed look about the eyes. In the presence of any of these physical signs, or in an unexplained pyrexia associated with any of the above-mentioned symptoms, it is essential to perform lumbar puncture. The diagnosis is then confirmed or refuted, and, if an infection is present, the type of organism can be determined.

In older children headache, vomiting, and neck rigidity are generally well marked, and the diagnosis correspondingly less difficult. All variations in the severity of the disease occur, from a fulminating type, which may even present with the Waterhouse-Friderichsen syndrome (Lindsay et al. 1940), to a subacute insidious form resembling tuberculous meningitis.

In the present cases the usual high incidence of septicæmia was found, 7 out of 9 blood-cultures being positive on admission. Arthritis developed in 3 out of 12 cases, in 2 involving more than one joint. In 4 cases the original diagnosis was pneumonia. It is important to realise that meningitis may be masked by a pneumonic mode of presentation. In some instances *H. influenzæ* pneumonia may actually precede (Huntington and Weiss 1936) or accompany the onset of meningitis, and meningitic signs may be attributed to "meningism." In other cases pneumonia may be simulated by the presence of rapid grunting respirations and by the deceptive fall in temperature and clinical improvement that may follow treatment with sulphonamides. It is unjustifiable to maintain this diagnosis in the continued physical signs in the chest or of radiographic unless meningitis has been excluded by lumbar

Some assessment of the severity of a case is re as a guide in treatment. Two types of severe occur, one a short fulminating illness, the subacute form that has deteriorated into a critic Generally the following features (largely derived Alexander's work) indicate that the disease is run a severe course.

(1) An age of less than seven months.

(2) A rapid downhill course, with the early app coma or of multiple fits.

(3) Deep and protracted coma suggesting encephalitis.

(4) Complications, especially laryngotracheo- pneumonia, or multiple suppurative arthritis.

(5) Lack of response to treatment, shown by a pers high temperature, no clinical improvement, the pers organisms in the C.S.F., or the development of re to the drug.

It has also been stated (Alexander 1944) that a sugar level of less than 15 mg. per 100 ml. ind severe infection. The sugar concentration was c in 6 of these cases, including 2 clinically severe and it exceeded this level in all of them.

Alexander et al. (1946) have stated that, streptomycin is effective in controlling mild or severe cases, it often fails in the more severe In the present small series our results point to conclusion.

Of 3 cases classified as severe on clinical one ran a rapid downhill course, the second d multiple pyarthroses and a resistant strain of and the third ran a continuous fever and a semicomatose state for nine days and su relapsed twice. All these children looked ill and dusky grey complexion in contrast to the milder who generally looked fairly well. Of the 7 mo severe cases 6 completely recovered. The one child died also had gastro-enteritis and at necropsy no evidence of active disease.

Streptomycin compares favourably with co treatment with specific antiserum and neither form of therapy alone gives satisfactory severe cases. For these Alexander et. al (1946) that treatment with all three agents would prove effective and the treatment of choice. Though combined with sulphonamides does not appear so effective as streptomycin it may yet prove combined therapy.

Relapses

In 3 cases there was a relapse after streptom treatment, 1 of these had two relapses. Such a proportion of relapses has not previously been rep with streptomycin. The initial course of treatment eight days in 1 case and ten days in the other 2, a second course of eight days was given to the case relapsed twice. The C.S.F. became sterile within four hours in each case. No definite indications of likelihood of a relapse were found, except that it more liable to occur in severe infections and fever persisted. Case 11, however, relapsed after afebrile for ten days; he had been sitting up and pl and the C.S.F. had returned almost to normal. significant feature in these cases was the duratio illness before streptomycin therapy was started. It wa fifteen, and twenty days, whereas in those that re on a single course it was four, five, eight, and ten days Alexander's 12 patients, most of whom received a shor course of treatment without a relapse, none had been longer than seven days (Alexander et al. 1946).

The necropsy in case 9 indicated a possible source a relapse. The infecting organism in this case resistant to streptomycin but responded to penic oss of water in the oxygenator was compensated by ing fluid to the blood with a drip feed during the usion. The disadvantages of hæmolysis, which some- s persisted despite every precaution, were diminished ising pure oxygen in the oxygenator, sodium bicarbo- solution being added to the blood by a drip feed nake the animal's urine alkaline. The unavoidable lolysis in the perfusion apparatus was well within limits of what can be tolerated in brain-perfusion riments. There was also some destruction of leuco- s, the lymphocytes being more resistant to mechani- trauma than the granulocytes. The thrombocytes not significantly affected.

here was a considerable fall in blood-sugar during circulation of blood in the perfusion apparatus. e the anoxic brain is especially sensitive to hypo- æmia, glucose solution was added by means of a feed.

the experiments on animals the perfusion apparatus first filled with blood taken from donor dogs and red through a 'Monell' filter (mesh 150 × 150 μ). blood in the apparatus was mixed with the dog's blood and filtered through the dog's own lungs re brain perfusion was begun. The technique was ollows. The blood from the apparatus was pumped ugh the right external jugular vein into the superior a cava and after traversing the lungs was withdrawn n one of the common carotid arteries. Thus, when n perfusion started the perfusion apparatus contained dog's own blood, mixed with donor blood which had n filtered through the perfused dog's lungs. During perfusion continuous filtration through a filter of h 300 × 300 μ was used, as a guarantee against bolism.

he apparatus has been tested in animals and found able of completely maintaining the circulation through brain for a sufficient time to permit bloodless intra- diac operations. In three dogs the vertebral arteries l veins on both sides were divided at the first stage a two-stage operation. After about 10 days the brain s perfused through the left common carotid artery, right being clamped for 25, 63, and 93 min. The ous cannula was inserted into the superior vena cava ough the right external jugular vein. After the brain l been perfused, nothing abnormal could be detected ring 5–7 months' observation.

With both the superior and the inferior venæ cavæ cluded and the azygos vein ligated, the brain was rfused for 33 min. with no ill effects on the dog. Seven gs have survived perfusion of the brain with the rdiopulmonary machine.

SUMMARY

Animal experiments have proved that the perfusion paratus described can perform the functions of heart d lungs for a sufficient time to permit bloodless tracardiac operations. Dogs have shown no ill effects fter half an hours' perfusion of the brain.

"... One finds most of the defenders of 'family integrity' the wealthier groups of society at the moment and it is t difficult to discern that, in many instances, the members those wealthier groups do, at their own expense, precisely hat they condemn in the other groups for whom the mmunity makes the corresponding provision. If it is ght to employ a 'nanny,' it is right to send a child to a ursery. If it is right to dine at the Savoy, it is right to dine a British Restaurant. If it is right to call in Sir X. Y. om Harley Street to look at a child who ails little or nothing, is right to take a child to a welfare clinic. All that remains the argument against State or community help for the mily is that nobody should receive what he cannot pay for t of his own pocket. In other words, the objection is to pauperisation' as it used to be called, which is a matter very fferent from the 'disintegration of the family.'"—*Medical ress*, Sept. 15, 1948, p. 193.

ABSORPTION AND EXCRETION STUDIES WITH RADIOACTIVE PENICILLIN

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WHEN penicillin is given parenterally it is rapidly excreted and a variable amount, up to 70%, is found unchanged in the urine (Topley and Wilson 1945). It is not known what happens to the remainder, and the weight of material involved is so small as to make this problem practically insoluble by ordinary chemical methods. Recently, penicillin containing the radioactive sulphur isotope, S^{35}, has been prepared (Rowley et al. 1948), and with this material the fate of the penicillin molecule can be followed by methods independent of biological activity.

The first experiments were designed to determine the excretion path of penicillin after intramuscular injection; then, with this information, to probe the more difficult problem of excretion of penicillin given by mouth.

For our experiments female cats were chosen, since they can easily be catheterised and produce a workable volume of urine. Premedication was given in the form of intraperitoneal urethane, 0·5 g. per kg. of body-weight, which sufficed to keep the cats docile. Immediately after the injection of penicillin the bladder was emptied with a glass catheter, the sample being discarded. Thereafter the cats were catheterised at intervals of 1 or 2 hours for 8–10 hours, the whole procedure being carried out as aseptically as possible.

Assay of Radioactivity

The radioactive penicillin used was labelled with sufficient S^{35} to enable the accurate detection of about $^1/_{10}$ unit with a Geiger counter (1 unit of penicillin was equivalent to 1100 disintegrations per min.).

The radioactivity of the samples was measured with a Geiger-Muller counter and scale-of-a-hundred recording circuit.

TABLE I—URINARY EXCRETION OF INTRAMUSCULAR PENICILLIN

Cat no.	Time	Volume of urine (ml.)	Total activity in sample (units)		Remarks
			Geiger-pen	Bio-pen	
2	2 hr. 0 min. 3 hr. 30 min. 5 hr. 0 min. 6 hr. 10 min. 8 hr. 0 min.	19 6 14 6 11	330 96 22 9 13	180 84 29 10 8	Penicillin 650 units injected. Samples were not corrected for self-absorption of β rays in this expt. *Recovery:* Geiger-pen, 72 % Bio-pen, 47 %
	Total	*recovery*	470	311	
3	1 hr. 40 min. 3 hr. 5 min. 5 hr. 5 min. 6 hr. 50 min.	4·5 14·0 36·0 21 0	121 515 67 6	72 308 35 10	Penicillin 700 units injected. *Recovery:* Geiger-pen, 101 % Bio-pen, 60 %
	Total	*recovery*	709	425	
4	1 hr. 50 min. 3 hr. 45 min. 5 hr. 45 min.	5·0 3·5 4·0	540 112 27	350 90 8	Penicillin 680 units injected. *Recovery:* Geiger-pen, 100 % Bio-pen, 66 %
	Total	*recovery*	679	448	
5	1 hr. 40 min. 3 hr. 20 min. 5 hr. 15 min. 6 hr. 40 min. 8 hr. 0 min.	3·0 4·0 14·0 7·5 16 0	279 212 134 24 19	120 80 28 7·5 0	Penicillin 680 units injected. *Recovery:* Geiger-pen, 98 % Bio pen, 36 %
	Total	*recovery*	668	235·5	

operation it is therefore necessary to maintain an adequate circulation of oxygenated blood through the brain with a perfusion apparatus capable of performing the work of both the heart and the lungs. In this cardiopulmonary machine the saturation with oxygen of a rapidly moving blood-stream must be achieved with the lowest possible destruction of red cells. At the same time physicochemical changes in the blood must be kept within normal limits.

THE APPARATUS

The main principle of the artificial blood-oxygenator is the brief exposure to oxygen of films of blood of as large an area as possible—i.e., the total area of blood film exposed per minute must be very large. In the apparatus we devised the blood flows through a trough occupying the lower part of a horizontal cylinder. This trough is divided into sections by partitions so made that the blood, passing from one section to the next, flows alternately over and under successive partitions (fig. 1). Through the cylinder runs a central axle bearing 40-50 discs in groups of 4 which dip into the blood and, as they rotate, expose new films of blood to the oxygen in the cylinder. This arrangement facilitates the mixing of oxygenated and unoxygenated blood. It also prevents some of the blood from remaining at the bottom of the trough throughout its passage through the cylinder. The upper part of the cylinder consists of a detachable tight-fitting lid of 'Plexiglass,' which allows the blood to be inspected at any time. The discs are of rhodium-plated stainless steel, 0·5 mm. thick, 13 cm. in diameter, and 4 mm. apart (closer discs were found to cause foaming). The axle is rotated at about 120 r.p.m. by a 40-watt electric motor.

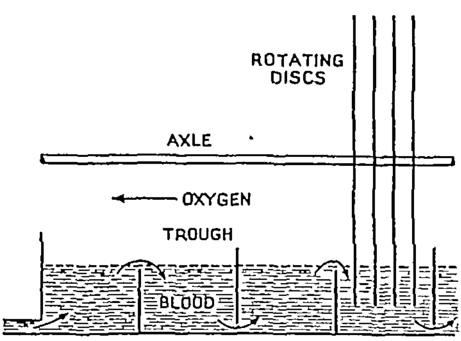

Fig. 1—Scheme of circulation through the oxygenating cylinder.

The pump (fig. 2) consists of a metal cylinder with a rubber cuff on the inside. The rubber tube for the blood passes through the centre of this cuff between two valves, made of a thin rubber band on a metal frame. The pumping action is attained by rhythmically inflating the cuff with compressed air, so squeezing the rubber tube.

The perfusion apparatus is shown in fig. 3, in which tube 1 conveys venous blood from the animal to a 20 ml. glass cylinder (2) and the rate of blood-flow can be determined by measuring the time taken by the blood to fill the cylinder when the tube to the oxygenator is closed and an air outlet is opened. From this cylinder the blood enters the oxygenator (3). Oxygen is supplied through a flow-meter; it is warmed in a metal tube passing over two 150-watt bulbs and travels in the opposite direction to the blood. There are two outlets for blood from the oxygenator. One (4) leads into a glass tube in front of a photo-electric cell, which keeps the blood in the oxygenator at about the same level by regulating the speed of the pumps. This blood re-enters the main blood-stream at 5, so that there is a continuous circulation of blood in these side tubes; otherwise the sedimentation of red cells would produce a translucent layer of plasma at the top of the blood in front of the photo-electric cell, which would then act incorrectly.

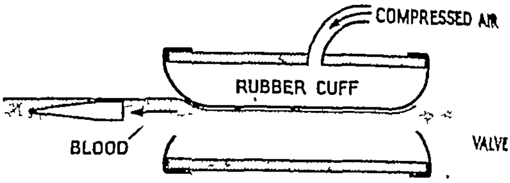

Fig. 2—Diagram of pump.

The saturated blood leaves the oxygenator tube 6, which divides into two parallel tubes, through the pumps (7), which work in parallel alternate pulsations. The two blood-streams ne bine and pass through a filter. Subsequently the passes between the walls of a double-walled glass containing the contact thermometer, the in the cup being filled with oil. There is a branch to a manometer (9) for blood-pressure reading. entering the artery through tube 10, the blood through a glass vessel, where any small air-bubble removed.

Latex surgical rubber tubing, with glass conne used. All glassware, rubber tubing, valves, and trough are coated with silicon to give them a and water-repellent surface. A solution of $(CH_3)_2Si($ and $CH_3Si(OH)_3$ in the proportion of 9:1 ('Si UHB 300,' Swedish patent 3408/48) is used.

RESULTS

The rate of gas-flow through the oxygenator was to have no significant effect on oxygenation or on elimination of carbon dioxide. Experiments with mixtures of oxygen, nitrogen, and carbon dioxide that an increase in the partial pressure of oxygen in oxygenator improved oxygenation but had no effect the elimination of carbon dioxide, which depended the partial pressure of carbon dioxide in the gas Raising the temperature improved both oxygenation the elimination of carbon dioxide. The optimal of exposure of each blood film to oxygen in the genator was found to be 0·4–0·5 sec. An increase n number of rotating discs increased the oxygenation

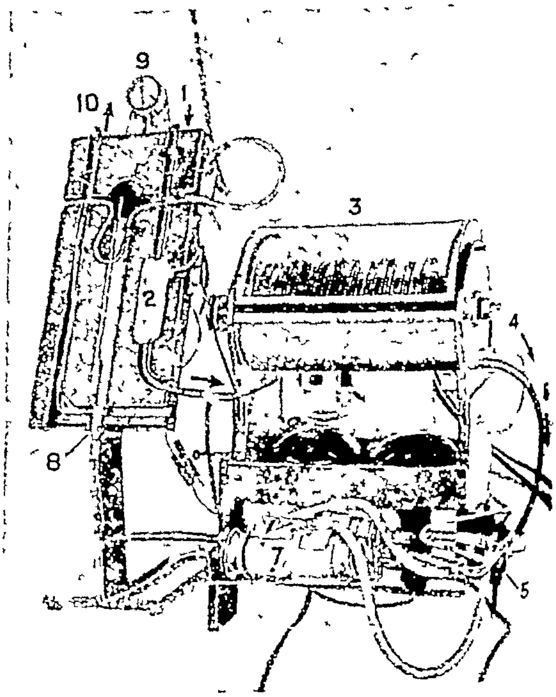

Fig. 3—The cardiopulmonary machine.

kdown products. Stewart and May (1947) concluded "The most important factor influencing the absorp- of penicillin [given by mouth] seems to be the plained individual variations in the absorptive city of the gut." From the present work it seems once the penicillin has crossed the intestinal wall ehaves in a manner exactly similar to injected cillin. It has been shown that the scanty excretion of cillin given by mouth can largely be explained by mplete absorption. Further studies directed towards oving absorption from the gut therefore seem to be h while.

SUMMARY

rinary excretion studies were carried out in female using penicillin labelled with S^{35}.

tramuscular injections of ordinary and labelled cillin gave rise to a urinary excretion of 100% of the oactive sulphur isotope, but to a much smaller very of penicillin.

here was no evidence of retention of penicillin in body as the radioactive breakdown products were eted over the same time interval as the penicillin.

hen the labelled penicillin was given by mouth much was excreted; the amount of radioactivity remaining he gut at the end of the experiment suggested that -absorption would account for the penicillin not d in the urine.

e wish to thank Sir Alexander Fleming for his continued rest in the work; the Medical Research Council for the rous gift of S^{35}; E. Lester Smith, D.SC., for the prepara- of the radioactive penicillin; Messrs. P. Roberts, B.SC., P. D. Cooper, B.SC., for valuable assistance; and the mmond Research Fund (D.R.) and the Sir Halley Stewart t (H.C.S.) for their continued financial support.

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INTESTINAL OBSTRUCTION DUE TO ASCARIASIS

REPORT OF A CASE

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A BOY, aged 14, a labourer, was admitted to this spital with thirty-six hours' history of abdominal lic, which had increased in intensity for twenty-four ours, with vomiting on six occasions and no passage f flatus or fæces in the last twenty-four hours. His st motion had been mixed with blood. For two months e had been losing weight and strength. He had reviously passed long worms in his stools and had had ttacks of colic during the last two months. After reatment by his doctor he had passed about 15 round-orms. Other members of his family had also passed undworms. The patient had no history of any other isease.

On admission the patient was anæmic, looked ill, had tacks of colic every few minutes, and vomited a roundworm, o cyanosis, no jaundice, no dyspnœa, no œdema, no clubbing fingers. Temperature over 101°F, pulse-rate 120 per min., spirations 26 per min., blood-pressure 120/80 mm. Hg. ongue furred and moist; teeth and tonsils clean and normal. bdomen moved freely on respiration; slight bulge in right pochondrium and epigastrium; peristalsis visible during lic, when a sausage-shaped mass was also seen in the igastric and both hypochondriac areas. This mass was nder on palpation and dull on percussion, rest of abdomen being soft, not tender, and resonant on percussion. Spleen not palpable; liver not enlarged. Peristaltic sounds heard on auscultation. Nothing abnormal detected per rectum except bloodstained mucus. Heart and lungs normal.

Treatment.—Two enemas produced neither flatus nor fæces. The patient was given morphine gr. $^1/_6$ and atropine gr. $^1/_{200}$ and prepared for laparotomy, intussusception having been diagnosed.

Operation.—Under general anæsthesia, induced with chloroform and continued with ether, a right paramedian incision was made, extending $2^1/_2$ in. above and below level of umbilicus. When peritoneum was incised, 2 ft. of much distended small intestine bulged out. Intestinal wall of the loop was so thin that it was transparent, revealing a compact mass of roundworms. Loop was 2 ft. proximal to ileocæcal junction; associated mesenteric lymph-glands enormously enlarged. Owing to thinness of intestinal wall and danger of rupture on manipulation I packed the peritoneal cavity; I then made a 2 in. incision in middle of loop, and evacuated 402 roundworms with sponge forceps. Loop was repaired with double layer of continuous sutures, and abdomen was closed. Operation lasted 55 min.

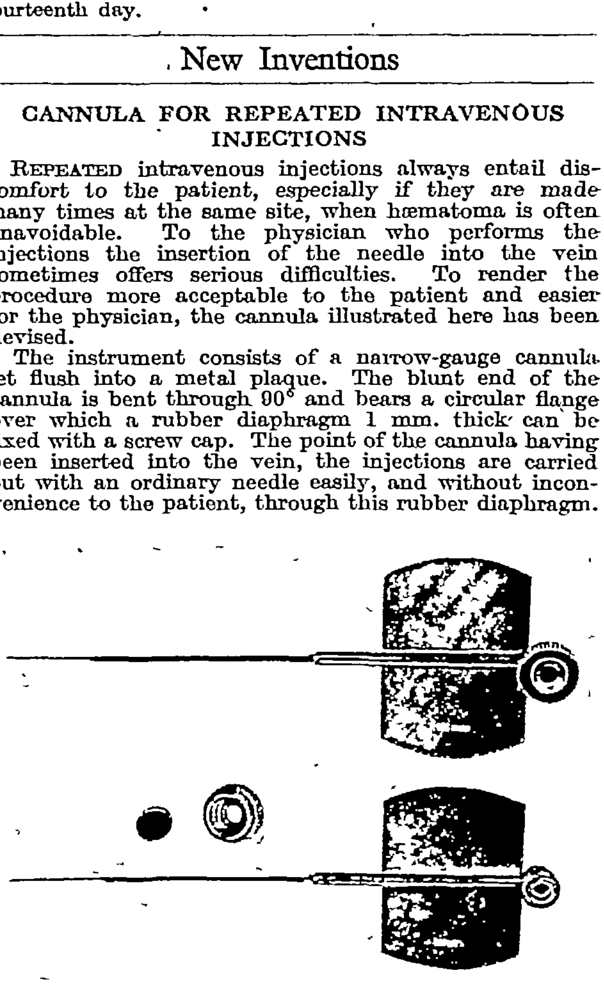
Postoperative Treatment.—To prevent ileus, the patient was given continuous rectal saline, and morphine gr. $^1/_6$ at midnight. Next day he was started on pituitary extract 0·5 ml. twice daily, and had acetylcholine 1 ml. twice. On third day rectal saline was stopped and fluid was given by mouth. On fourth day a morning enema produced fæces; temperature normal; pulse-rate 90. On fifth day pituitary extract was stopped, and the patient was given light diet and a morning enema. On seventh day the patient was given santonin gr. 6 followed by castor oil, and four roundworms were passed. Santonin gr. 3 and castor oil was given on eighth and ninth days, and on ninth day 19 roundworms were passed. Full diet was given, and stitches were removed on tenth day. The patient was discharged from hospital on fourteenth day.

New Inventions

CANNULA FOR REPEATED INTRAVENOUS INJECTIONS

REPEATED intravenous injections always entail discomfort to the patient, especially if they are made many times at the same site, when hæmatoma is often unavoidable. To the physician who performs the injections the insertion of the needle into the vein sometimes offers serious difficulties. To render the procedure more acceptable to the patient and easier for the physician, the cannula illustrated here has been devised.

The instrument consists of a narrow-gauge cannula let flush into a metal plaque. The blunt end of the cannula is bent through 90° and bears a circular flange over which a rubber diaphragm 1 mm. thick can be fixed with a screw cap. The point of the cannula having been inserted into the vein, the injections are carried out with an ordinary needle easily, and without inconvenience to the patient, through this rubber diaphragm.



S^{35}, an isotope with a half-life of 87 days, emits β rays of small penetrating power. In measuring such soft radiations difficulties are encountered owing to the absorption of the β rays both in the window of the Geiger counter and in the material of the sample (self-absorption). The former difficulty was largely overcome by using on the counter a very thin mica window through which the radiations could pass readily. To correct for self-absorption samples containing known amounts of S^{35} mixed with known amounts of absorbing material were assayed. From these results a graph was drawn relating loss from self-absorption to weight of the sample. In this way correction could be made for self-absorption in each of the samples measured. To ensure the greatest possible accuracy the procedure was designed to keep this correction as small as possible. In preparing for radioactive assay each sample was diluted to $^1/_6$ with distilled water, and 100 c.mm. was pipetted on to a nickel planchette and dried by heating at 130°C for 15 min. The planchettes were kept in a desiccator over calcium chloride until the actual counting, since they were found to absorb water vapour, so increasing the self-absorption of the material.

To minimise statistical errors, at least 5000 counts were taken with each sample, and each count was continued for more than 5 min., to give a timing error less than the statistical error. The total error in the radioactive assay of each sample was less than 5%.

Biological Assay

For our purposes the plate method (Fleming 1942) was satisfactory. As Heatley (1944) has shown, there may be an error in this method of ± 30%. Estimation was greatly facilitated in our case by our knowing from previous radioactive measurements the approximate concentration of penicillin to be expected. The amount of penicillin in the pooled samples from each cat was doubly checked by extraction with an equal volume of amyl acetate at pH 2·5 to remove 95% of the biological penicillin (Ro et al. 1946). The number of units extracted correspo exactly to the sum of the individual bio-assays. Thr this double check the error in our bio-assays is likely t be less than the figure given above.

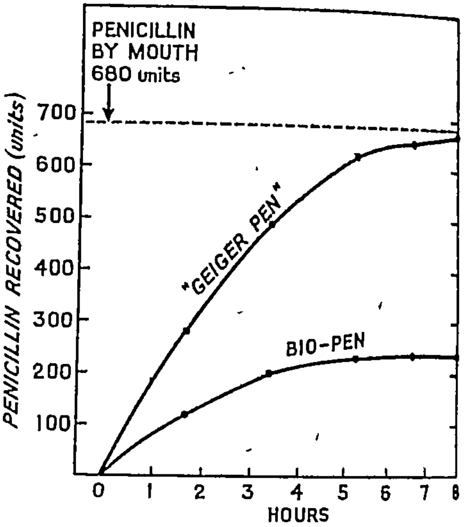
TABLE II—URINARY EXCRETION OF PENICILLIN GIVEN BY MOUTH

Cat no.	Time	Volume of urine (ml.)	Total activity in sample (units)		Remarks
			Geiger-pen	Bio-pen	
6	1 hr. 35 min. 3 hr. 10 min. 4 hr. 35 min. 6 hr. 5 min. 8 hr. 0 min.	6·5 21·5 40·0 20·0 15·0	60 118 132 26 12	40 97 20 0 0	Penicillin 650 units given by mouth in 5 ml. of total fluid. *Recovery:* Geiger-pen, 54 % Bio-pen, 25 %
	Total	*recovery*	348	157	
7	1 hr. 35 min. 3 hr. 25 min. 5 hr. 15 min. 6 hr. 30 min. 8 hr. 0 min.	25·0 3·5 3·5 2·0 4·0	235 224 115 27 36	50 140 49 8 4	Penicillin 2600 units given by mouth in 20 ml. of total fluid. *Recovery:* Geiger-pen, 24 % Bio-pen, 10 %
	Total	*recovery*	637	251	
8*	2 hr. 20 min. 4 hr. 0 min. 5 hr. 45 min. 7 hr. 0 min.	1·9 2·7 4·0 1·0	105 81 44 7	114 81 40 2	Penicillin 650 units given by mouth in 5 ml. of total fluid. *Recovery:* Geiger-pen, 36 % Bio-pen, 36 %
	Total	*recovery*	237	237	
9	2 hr. 10 min. 4 hr. 5 min. 5 hr. 30 min. 7 hr. 0 min.	3 15 16 29	46 73 60 30	18 22 0 0	Penicillin 560 units given by mouth in 5 ml. of total fluid. *Recovery:* Geiger-pen, 37 % Bio-pen, 7 %
	Total	*recovery*	209	40	
10	1 hr. 25 min. 3 hr. 5 min. 4 hr. 40 min. 6 hr. 10 min.	17·0 1·5 1·8 2·2	7 30 52 52	.. ..	Penicillin 590 units given by mouth in 8 ml. of total fluid. Recovery of Geiger-pen: urine 24 %, gut† 59 %
	Total	*recovery*	141	..	

* Repeat of cat no. 7.

† Cat no. 10 was killed, and Geiger-pen units were determined in the contents of its whole gastro-intestinal tract, as follows:

		Geiger-pen (units)
Stomach	Vol. 60 ml.	166
Small gut	Vol. 80 ml.	183
Large gut	Vol. 80 ml.	0
		349



Urinary excretion of penicillin given by mouth to cat 5.

EXPERIMENTAL RESULTS

For easy comparison the radioactivity in the various urines has been back calculated into "Geiger-penicillin units" on the basis of 1100 disintegrations per min. being equivalent to 1 unit of penicillin. Some of this radioactivity was present as penicillin breakdown products; the amount of this non-penicillin radioactivity was calculated by subtracting the biological-penicillin (bio-pen) level from the "Geiger-penicillin" (Geiger-pen) level.

Intramuscular Injection.—The results of intramuscular injections of labelled penicillin are summarised in table I; the excretion curve from cat 5 is shown in the accompanying figure. It is apparent from these results that the difference between the amount of penicillin injected and that which appears as bio-pen in the urine is represented by breakdown products of penicillin excreted in the urine as rapidly as the penicillin itself.

Penicillin by Mouth.—In these experiments, solid food having been withheld for the previous 24 hours, the penicillin was given by stomach-tube and washed down with an equal volume of water. Otherwise the technique was the same as before.

The results of these experiments, summarised in table II, show that, when penicillin is given by mouth, by no means all the penicillin or its breakdown products are recovered from the urine. In cat 10 an attempt was made to determine whether this was due to retention in the intestinal lumen. Six hours after penicillin had been given by mouth the cat was killed and the radioactivity of the contents of various portions of the gut determined after thoroughly washing through the gut with water. It was found that 59% of the original radioactivity still remained in the gut, whereas 24% had appeared in the urine. In spite of the fact that urinary excretion had not finished, the presence of such a large proportion of the original activity in the gut after six hours strongly suggests that non-absorption from the gut is the reason for the low urinary excretions after penicillin has been given by mouth.

DISCUSSION

The experiments with intramuscular penicillin clearly show that it is not stored in the body at all but is quickly excreted, partly as penicillin and partly as penici

THE LANCET

LONDON: SATURDAY, SEPT. 25, 1948

Penicillin in Syphilis

VE years have passed since penicillin was first in syphilis, and it is doubtful whether its value be fully assessed for at least another five. Yet, ite of some early doubts and disappointments, s been accepted almost universally and there can o doubt that it has come to stay. In the United es a report,[1] based on the treatment of half a on cases, assesses the present position. Crystalline cillin II (G) is regarded as superior to the impure mercial product, and it is best given intramuscu- in doses of 20,000 to 100,000 units dissolved in le water or isotonic saline every two or three s day and night. The alternative is to inject a ension of calcium penicillin in arachis oil with % beeswax in a daily dose of 600,000 units. The method requires admission to hospital and the recommended for early syphilis is 4·8 million s given in 96 doses, each of 50 000 units at two- r intervals day and night for eight days. With oil- mixture the daily dose is given for ten days, the l dosage being 6 million units. With both methods, n penicillin is used alone, the failure-rate of resis- t cases and relapses is about 15% at the end of ar. The addition to this treatment of arsphenoxide n intensively in the form of 8 injections each of mg. daily or every other day, and bismuth sub- cylate in 5 doses each of 0·2 g. every two or three s, does little to diminish the failure-rate. With litional fever therapy results have been little better, this supplementary treatment adds to the diffi- ty of getting patients to coöperate.[2] Such accessory thods also involve increased risks to the patient d are therefore reserved for resistant cases, in ich they are combined with more penicillin.

For latent syphilis, in which the duration of infection often uncertain, penicillin has been used in the same sage on the assumption that it will heal undetected ions and may prevent the development of clinical anifestations later. It seems to be no more effective an arsenicals and bismuth in converting positive rum tests to negative in cases of late and latent fection, a finding which accords with the experience WILLCOX[3] in this country. Penicillin has proved effective as older remedies in healing the cutaneous, icous, osseous, and visceral lesions of so-called nign late syphilis; but with these conditions, as th latent syphilis, many years must pass before tistics can show whether it will secure a good imate prognosis. The same applies to cardio- scular syphilis, and the possibility of dangerous Herxheimer reactions remains where syphilitic aortitis is complicated by aortic regurgitation, saccular aneurysm, or involvement of the coronary ostia; in such cases penicillin, if it is used at all, should only follow protracted treatment with heavy metals. For neurosyphilis of the meningeal and vascular types a dosage of 4–10 million units is recommended, given in aqueous solution over a period of seven to twenty-one days without adjuvant treatment. For parenchymatous neurosyphilis 10–20 million units is given in twelve to twenty days, accompanied by malaria therapy unless this is contra-indicated. In neurosyphilis of all kinds intramuscular administration seems to be as effective as intrathecal and is certainly much safer. For the prevention of syphilis in the unborn child penicillin has been remarkably successful and seems to be almost fully effective at whatever stage of pregnancy it is given. Dosage varies from 4·8 to 6 million units, given in aqueous solution at intervals of two to three hours over eight to fifteen days. Additional treatment is regarded as unnecessary and undesirable. For infantile congenital syphilis penicillin in aqueous solution is given every two or three hours day and night in a total dosage of 100,000 to 400,000 units per kg. of body-weight over one to two weeks. The results are excellent and the death-rate has been no higher than with other methods, most deaths being attributable to nutritional difficulties or intercurrent disease. For the later manifestations of congenital syphilis the results with penicillin have been much the same as in late acquired syphilis, and the ultimate outcome in these cases remains equally in doubt. Like other forms of treatment penicillin is of uncertain value for interstitial keratitis.

Penicillin has the outstanding advantage that, as its toxic effects are few and not dangerous, a massive dosage can be given in a short time. Because of its safety and its prompt and satisfactory effect it may now be accepted as the remedy of choice for syphilitic pregnant women and for infants with congenital syphilis. In cases of benign tertiary syphilis the patient's immunity processes have already given him a large measure of protection, and treatment will readily restore a temporary loss of balance between infection and immunity. Here penicillin appears to have great advantages whether used alone or supplemented by other measures. The chief outstanding problem is whether we are justified in treating early syphilis with penicillin alone, for at this stage the immunity reactions are not fully developed and insufficient treatment may be worse than none. The verdict in the United States so far is in favour of penicillin alone, and it may be said that this treatment is free from danger, the proportion of successes seems reasonably high, and the short duration of treatment throws into sharp relief the small number of cases which are likely to be resistant to any form of treatment and will require special measures.

In most British clinics the practice is to supplement adequate penicillin therapy with at least one full course of arsenicals and bismuth, given in weekly doses for ten weeks or so. This prolongs treatment considerably and increases its dangers. If it can be shown that this procedure greatly reduces the incidence of failures then it is probably justified.

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It is advisable to remove the cap and diaphragm before inserting the point of the cannula into the vein so that escaping blood will show that the point of the cannula has entered the lumen of the vein. The cannula is kept in place with strips of tape crossing the metal plaque. The rubber diaphragm can easily be changed for a fresh one after a considerable number of injections. The cannula can be inserted at any site, but preferably into the dorsum of the hand or the forearm, and can be left there for several days.

Hitherto its most extensive use has been in heparin treatment and general intravenous anæsthesia. It has also been adopted for protracted intravenous infusion and blood-transfusion. For several years this cannula has been used extensively in the surgical departments of the Swedish hospitals. At Serafimerlasarettet in Stockholm it is used in practically all operations. All intravenous injections during operation are given with it. When it is used for infusions during operation, the person giving the infusion should steady with his hand the infusion needle through which the liquid is introduced into the cannula. After each injection the rubber diaphragm is cleaned with alcohol or ether; the cannula may also be protected with sterile surgical gauze. The cannula is used daily in our operation services and, so far as I know, there has never been a case in which septicæmia could be attributed to it.

Stockholm. THORE G. OLOVSON, M.D.

Reviews of Books

Lecture Notes on Pharmacology

J. H. BURN, M.D., F.R.S., professor of pharmacology, University of Oxford. Oxford: Blackwell Scientific Publications. 1948. Pp. 128. 6s.

IT may be doubted whether many students, grappling with standard works on pharmacology, share Elia's affection for big books. "And you my midnight darlings, my Folios! must I part with the intense delight of having you (huge armfuls) in my embrace?" In his preface Professor Burn rightly deplores the fact that "almost all medical textbooks are longer than they should be." He might have added that too few teachers seem to appreciate the student's difficulty when confronted with the task of reading a completely new subject. This is a readable little book, and despite its brevity it has the merit of being comprehensive and up to date. It should prove invaluable as a companion to standard textbooks on the subject; but the student who thinks that these lecture notes provide a convenient substitute for the "huge armfuls" is courting disaster by underestimating the perspicacity of his examiners.

Hutchison's Food and the Principles of Dietetics

(10th ed.) V. H. MOTTRAM, M.A., formerly professor of physiology, King's College of Household and Social Science, University of London; GEORGE GRAHAM, M.D., F.R.C.P., consulting physician, St. Bartholomew's Hospital. London: E. Arnold. 1948. Pp. 727. 21s.

TEN years ago, general nutrition occupied about a seventh of this book; today—reflecting many important advances—it occupies more than a third. New chapters on the hygiene and processing of food insist refreshingly on the variability of the individual and the uncertainty of much of our knowledge. Professor Mottram might have explained earlier, though, that the figures given by the National Research Council of the U.S.A. are not requirements but recommended allowances—"a tentative goal towards which to aim." Much of the dogma which mars books on nutrition is absent here, but a little remains. It is not at all certain, for example, that vitamin C really is concerned in the oxidation-reduction systems of the body; indeed, several items in this first section of the book are out of date.

The section describing the properties of food distinguishes this book from almost all others concerned with dietetics, and is extremely useful. One or two other sections are less satisfactory, but also as a whole this classical work still keeps its place among the best and most informative books on the subject.

The Aseptic Treatment of Wounds

C. W. WALTER, M.D., assistant professor of Harvard University. New York and London: Macmi 1948. Pp. 372. 45s.

As the late Elliott Cutler says in his foreword, this contains "information of the utmost value to who is concerned with the surgical care of pati whether it be the surgeon, the nurse, the medical st or the hospital superintendent." It describes the ciples of aseptic surgery and the methods of principles into practice. Surgeons are apt to accept sterilised dressings, powders, gloves, and other mat handed to them as unquestionably sterile inquiring into the methods used for making them The intricacies of this apparently simple procedure soon realised by anyone responsible for setting arrangements for carrying out aseptic surgery. book goes into the technique of sterilisation in all aspects and also into the details of procedure in the operating-theatre and the wards. Moreover step of the nurse or surgeon is depicted in clear drawings. The teaching in this book will provide a basis for the instruction of nurses, students, dressers, or others who are to take part in operations.

Textbook of Anæsthetics (7th ed. Edinburgh: E. Livingstone. 1948. Pp. 568. 30s.).—This book by Dr. R. J. *Minnitt and Dr. John Gillies has become one of the* textbooks in the English language. In addition to a revision of the text, the section on local and regional ana has been enlarged, and a useful chapter on curare has added.

Recent Advances in Cardiology (4th ed. J. & A. Churchill. 1948. Pp. 454. 24s.).—Dr. Terence and Dr. Curtis Bain have entirely rewritten this new which is naturally longer than its predecessor of 12 years. The authors' own views are interwoven with, though largely subsidiary to, a large number of references to work; no important modern paper remains unquo however briefly. The chapter on congenital heart dise deals relatively fully with a topical subject in which kn and treatment are now advancing hand in hand; and chapter on the latest methods of cardiography unipolar leads and vector cardiograms.

Cardiovascular Diseases (2nd ed. London: Heinem Medical Books. 1948. Pp. 743. 63s.).—In its new edi this book is at least twice the length of the first, and has now become a comprehensive textbook of cardiology. A considerable section on peripheral vascular dis has been added and also a large bibliography. Prof. David Scherf and Prof. Linn J. Boyd, of the New York Medical College, quote workers of all nationalities, yet have their own clear-cut views on all aspects of the subject; and *it is this imprint of their* personality which gives the book a welcome freshness. Its clear and thoughtful style (apart from one or two ambiguities which persist from the first edition), and the attempt to assign a physiological reason for symptoms whenever possible, give it a place in the front rank of cardiological textbooks.

Diseases Affecting the Vulva (3rd ed. London: H. Kimpton. 1948. Pp. 204. 25s.).—Written by a dermatologist of wide experience, this useful book provides for other dermatologists a systematic text on skin conditions of the vulva, and reminds the gynæcologist that vulvar lesions are identical with lesions elsewhere on the skin surface. Dr. Elizabeth Hunt points out that abnormalities of the vulvar skin may well be localised manifestations of a general reaction or due to local irritants—often used in the course of mistreatment. The gynæcological aspects are well presented and the coloured photographs reliable. Caruncle, however, is an *exception*, and there is no mention of the excellent results which follow extended lymphadenectomy for carcinoma of the vulva (Bassett's operation). Dr. Hunt believes that kraurosis vulvæ is only a late or modified stage of leukoplakia which is itself lichen sclerosis modified by site. With this in view, she deprecates the use of excessive œstrogen dosage in *this* and allied conditions, and advises against vulvectomy, except in the case of proven carcinoma. As before, many useful prescriptions are included in the text and a general review of therapeutic methods is given as an appendix.

be attempted he cannot be severely criticised example has proved to be ill chosen: he reveals the need for fuller study by a team of in close touch with the subject. But this is erm policy. Dr. COHEN, like the rest of his gues on the Working Party, leaves us with no diate plan for dealing with the nursing crisis.

Myelomatosis

the story of a day in the life of a professor of ine, broadcast a few weeks ago, the professor ısing a sternal bone-marrow smear to diagnose a f myelomatosis when X rays showed no evidence disease. This feat, unusual for any clinician, bly surprised the medical members of the nce more than others, because myelomatosis—ltiple myeloma—calls up a picture of a patient severe back pains or pathological fractures, in X-ray examination reveals typical "punched- areas in flat bones and the diaphyses of long , and who has Bence-Jones proteose in the . The professor, however, was quite right lly astonishing since Prof. L. J. WITTS was the r), and he was citing yet another disease in marrow biopsy has helped to clarify diagnosis uncover many previously unsuspected cases. as LICHTENSTEIN and JAFFE[1] have pointed out, vell-known picture represents the exception rather the rule. Proper diagnosis of myelomatosis has than academic interest since there is now some of treating and at least arresting the disease.

fore bone-marrow biopsy became widely used lomatosis was deemed a rare disease. WALLGREN[2] weden could collect only 66 genuine cases between and 1920; GESCHICKTER and COPELAND[3] at as Hopkins found 425 cases in the eighty years re 1929. ROSENTHAL and VOGEL[4] in New York 3 cases in nineteen years up to 1935; but in less three years after this date, when marrow biopsy used, 13 cases were diagnosed. The bone-marrow nges are easily recognised: large numbers of ma cells of normal and abnormal types are ent; the abnormal types have been named by e "myeloma cells," but most agree with DIGGS SIRRIDGE[5] that all the cells are variants of sma cells. Now plasma cells can be found in all numbers in almost every marrow smear, but y are increased only in a very few conditions apart m myelomatosis, and in these others the abnormal es do not appear. Armed with this new knowledge has been possible to diagnose forms that were not ught to be this disease at all. There has also n some simplification; different cellular types of elomatosis were described, but since marrow biopsy introduced[6] only one form of myeloma— plasmacytoma—has appeared. AEGERTER and BBINS[7] consider the evidence for distinguishing erent forms very doubtful and suggest that the ne plasmacytoma is more accurate, and LICHTEN- IN and JAFFE agree that all forms of myelomatosis are variants of a single disease complex. APITZ[8] is generally credited with the first clear definition of the unity of the various clinical and pathological types of myelomatosis. The most localised form is the "solitary myeloma," in which a tumour appears most commonly in a long bone or a vertebral body and presents either as a tumour or because of a pathological fracture. But a careful search often reveals other small tumours, and in some cases the sternal marrow shows plasmacytosis. The next stage is the classical multiple myeloma with numerous small plasma-cell tumours and a general increase of plasma cells throughout the bone-marrow. The early clinical picture of this type may not suggest bone disease at all. Backache, pains confused with sciatica, or vaguely localised pains dubbed "rheumatism" are common. Other patients may present as a "blood" disease with anæmia, epistaxis, and weakness as the prominent signs; these patients are diagnosed early, as sternal-marrow puncture should be part of the investigation; they also have bone pains. especially backache. Then there is a form in which there is diffuse replacement of hæmopoietic marrow by masses of plasma cells. This generalised form has only been recognised through marrow biopsy; the patients have an insidiously progressive weakness, loss of weight, pyrexia, and anæmia; X-ray films show demineralisation of bone which is often reported as "senile osteoporosis." Finally, there is the rare generalised form in which plasma cells appear in the peripheral blood —the so-called plasma-cell leukæmia. One of the odd features of myelomatosis is its association with amyloid deposits, sometimes only microscopic but sometimes macroscopic and occurring in unusual places. LICHTENSTEIN and JAFFE found amyloid in 10% of their cases; and KOLFF and DHONT have suggested that "primary" amyloid disease (paramyloidosis) may really be an unrecognised form of diffuse myelomatosis; the patients often have Bence-Jones proteinuria and hyperglobulinæmia.

Biochemical changes are often striking in myelomatosis. Bence-Jones proteose in the urine and a rise in serum globulin and serum calcium are the most notable, but none of these is constant or necessary for diagnosis. Bence-Jones proteosuria is absent in many cases; estimates of its incidence vary from 65% to less than 10% of cases. GUTMAN[9] says that serum calcium is raised in 30–50% and serum proteins in over 50% of patients; renal obstruction may raise the serum inorganic phosphate. These changes are not correlated, for a patient may have a high serum protein but no Bence-Jones proteosuria, and so on. The diagnosis of myelomatosis, when X-ray findings are not clear, consequently depends more on sternal-marrow biopsy than on any other investigation. When the physician is faced with a patient aged between 40 and 60 years with pyrexia of undetected origin wasting, backache, and possibly anæmia and epistaxis, myelomatosis should be kept in mind and looked for

Treatment of myelomatosis with stilbamidine (4, 4-diamidinostilbene) was first reported by SNAPPER in New York in 1946. Stilbamidine was designed for the treatment of kala-azar, and, because in this disease the serum globulin is high, it was thought

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[8] Apitz, K. *Virchows Arch.* 1940, 306, 631.
[9] Gutman, A. B. *Bull. N.Y. Acad. Med.* 1947, 23, 512.

McELLIGOTT and his colleagues,[4] at St. Mary's Hospital, Paddington, treated 275 patients for primary or secondary syphilis with 2·4–4 million units of penicillin over seven to twelve days, followed in most cases by 12 injections of neoarsphenamine and of bismuth during six to ten weeks. About half of these patients were followed for twelve months or more, and the remainder for shorter periods. During this time there were 11 cases (4%) in which treatment was known to have failed. Severe toxic effects from the arsenicals occurred in 10 cases. In Montreal MARIN and others[5] treated 201 patients for early syphilis with 2·4 million units of penicillin given in a week, followed by 4 injections a week of 60 mg. of arsphenoxide and 2 injections a week of bismuth during a period of five weeks. Three-quarters of the patients were observed for six months or more. The treatment failed in 9 cases (4·5%), and the outcome seemed doubtful in another 6%. One patient died from arsenical encephalopathy. Both these studies concern too few patients followed for too short a time for definite conclusions to be drawn from the results.

Penicillin has not proved an unmixed blessing for those who treat syphilis. When it is given for the treatment of gonorrhœa in patients who are incubating syphilis the early signs may be delayed or even suppressed. In the same way, the wide use of this remedy for all kinds of infections, major and minor, must mean that syphilis will be masked, and may produce a considerable crop of late syphilitic manifestations in the future.

How Many Nurses?

Mr. JOHN COHEN, PH.D., whose minority report[6] as a member of the Working Party on the Recruitment and Training of Nurses has just appeared, asks us to pause and consider, not how many nurses we would like or think we need, but how many can in fact be obtained from the woman-power of the country. Nor would this give the complete answer: we have to consider, too, how many nurses we can afford. A planned health service, as he points out, "presupposes a planned economy in which a correct proportion of our national resources is devoted to health." As an impoverished country, we must bear in mind that what we spend, however advantageously, on medical services will have to be saved on something else, and we shall have to decide what that is to be. Even if the Treasury were inexhaustible, the supply of women is not. Nursing—like teaching, secretarial work, the social services, the medical auxiliary services, and other occupations open to intelligent women—can only hope to enrol its "fair share" of candidates; and what that fair share may be, he suggests, has never so far been determined. We have yet to discover the optimum number of beds per 1000 of population, and the optimum number of nurses needed to look after them. These things should not be matters of opinion but matters of ascertainable fact.

Pursuing the question whether it is economically justifiable to employ more nurses, Dr. COHEN endeavours to compare the "output" of different h tals which have different ratios of patients to staff. it could be shown that patients return to work s after treatment in hospitals having relatively l nursing staffs, then we might have evidence that community could profitably spend more of its res on employing and training nurses. Arguing that " task of nurses and doctors alike . . . is, presum " to speed the patient's recovery" he takes as economic criterion of nursing (or medical) the duration of the patient's stay in hospital. Fir that this is, on the whole, shorter in well-staffed he compares the national cost of good staffing national gain in working days saved for prod —the evidence providing him with "a prima case, on economic grounds, for substantially the number of trained nurses in general hospital Unfortunately, few will agree with the initial tion on which all this is founded—namely, that duration of the patient's stay in hospital is a factory "objective measure of the task of nurses doctors." The length of stay is in fact affected many variables other than the ratio of staff to pati Apart from the type of illness (for like groups can compared with like groups), it may vary with custom of the hospital, its facilities for investig and treatment, the pressure of the waiting-list, provision of convalescent homes, and even the of the hospital diet. Nor do the figures he supp justify Dr. COHEN's prepossession with this parti yardstick.

In 269 voluntary general training hospitals he was to demonstrate a not very striking inverse relati between the duration of stay and the ratio of tr nurses to beds. (The figures were taken from a made as long ago as 1938.) But this is in fact the piece of evidence he presents in favour of his hypo and the equivocal results of applying it to other grou of nurses and to doctors should have convinced him he had lashed himself to the tail of a red herring. the presence of student nurses, in general hosp "seems to have little or no effect on the patient duration of stay," results "offer little support for view" that the duration of stay could be affected changing the ratio of doctors to patients; and data mental hospitals (surveyed in 1934–38) suggest "an increase in trained nurses alone without increa the number of other nurses and medical staff is unlike to reduce patient stay"; whereas an increase of untrained nursing assistants per 100 beds (an additi of 800 to our total complement of such assistant "would apparently reduce stay, on the average, by much as three months." (The same effect, he believe might be achieved by adding another 200 part-time doctors to the staffs of our mental hospitals—though an addition to the full-time staff would be likely to ha no effect at all.) Faced with all this conflicting evidence Dr. COHEN argues ingeniously that the trained gen nurse is more "effective" than the student of gen nursing, whereas the nursing assistant is more "eff tive" than the trained mental nurse; and that full-ti doctors in a mental hospital fail to reduce patient st because they "sometimes tend to persuade some patien to stay on at the hospital so as to improve their condi still more"—an argument which does little to support hypothesis that the length of patients' stay is measure of the effectiveness of the doctor.

The fact that this attempt to provide a worki measure of nursing production is so questionable d not, however, invalidate Dr. COHEN's general the that we are still very ignorant about this subject and that it is time we studied it more ob Since he is concerned only to give an idea of w

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4. McElligott, G. L. M., Jefferiss, F. J. G., Willcox, R. R. *Brit. J. ven. Dis.* 1948, 24, 45.
5. Marin, A., Boulais, F. L., Lambert, A., Foisy, J. P., Leclerc, G. *Canad. med. Ass. J.* 1948, 59, 1.
6. Working Party on the Recruitment and Training of Nurses, Minority Report. London: H.M. Stationery Office. 1948. Pp. 78. 1s. 6d.

practice, however good his intentions. He might liged to hold a surgery at his own home before eding each morning to the centre, and this might cause a waste of time through which his day's would suffer.

Hastings very rightly wants to avoid two standards atment inside the health centre. But by excluding rivate patient is he not in danger of fostering the that something better, or something more con- te, can be provided for the private patient at the r's own surgery? Surely our aim is to provide the possible conditions for practice inside the health s. We want this to be recognised alike by doctor atient. We shall not teach any patient the value of centres by denying him entry to them. We shall nhance the attraction nor increase the efficiency of entre by carving on its lintel "No admittance for te Patients." Once the centres are provided, we use them to their greatest advantage—use them ially to save the doctor waste of time and effort it his energies may be utilised to the full. The Act s the patient the right to obtain privately any section ooses of his medical care, and expressly permits the itioner to give private attention to patients who on having it. Anomalies are bound to arise through ery provision. But the more we try to keep separate are of the two groups of patient, the greater the ulties we create for ourselves and the greater the of man-hours we cause. In any case we could not the separation to a logical end without arriving at icrous conclusion. If we exclude the private patient the centre in person, must we also prevent his doctor testing in the centre his blood, his urine, or anything is his? Must telephone calls to the doctor be refused e centre if they concern private patients? Indeed, the doctor even ponder the problems of a private nt, or discuss them with a colleague, once he is le the portals of the centre? Each and every one of e things he can do, or have done, for his patient at State-provided hospital: why not at the State- ided centre?

eling, as we do, that there is no logical or justly lable point at which a line of division could be n, and confident that numerically the demands e on the centre by the private patient will not reat and will not in practice necessitate any discrimi- on between the two types of patient, we still believe in the first experimental centres doctors should not orbidden to treat those private patients who elect to nd there. The day-to-day experience of these centres be far more valuable than any present postulation; , if our contentions are proved wrong, and the smooth ning of these early centres founders on the rock of s discrimination, it will then be time enough to try tead the feasibility of making the doctor segregate patients and conduct his practice in duplicate from separate establishments. Time enough, if our sent opportunity has not itself been lost through greement, discouragement, and delay.

RADIOACTIVE PENICILLIN

HE prospect of growing supplies of radioactive isotopes, ounced in these columns last week (p. 469), opens an exciting and obviously fertile field for pharmaco- cal and physiological research. It is 25 years since esy[1] first applied isotopes to the study of plants, g radioactive lead. In the early experiments only urally occurring radioactive substances could be d and the scope of this powerful weapon of investiga- remained strictly limited until a method for pro- ing radioactive isotopes artificially was discovered by Joliot-Curie and Joliot[2] in 1934. In 1932, Urey and his colleagues discovered deuterium (H^2) and soon developed practical methods for the production of highly concentrated "heavy water." In the next decade radioactive isotopes of nitrogen, carbon, sulphur, phosphorus, iron, and many other elements were produced. In a relatively short time, therefore, a wealth of isotopic tools became available for the elucidation of physiological and biochemical problems which had previously defied solution. Much interesting information was soon gathered. Using radioactive sulphur, for instance, Tarver and Schmidt[3] showed that in normal metabolism the sulphur of cystine is derived, at least in part, from methionine, but not from elementary sulphur or from sulphate. Radioactive isotopes of iron have been used by Whipple and his associates[4] in biochemical and physiological studies of erythrocytes. A fascinating aspect of isotope research is the determination of the steps in the breakdown or synthesis of biologically important products by the organism. An isotope of phosphorus, P^{32}, has been used for the study of phospholipid, nucleoprotein, and carbohydrate metabolism, while thyroid function and iodine metabolism, including the rôle of the pituitary thyrotropic hormone, have been studied with I^{131}.

Thus, starting from naturally occurring radioactive lead, through the induced radioactive isotopes of many elements, organic substances have been built up containing radioactive carbon, nitrogen, phosphorus, or sulphur, and these have provided us with agents for probing the mysteries of intermediate metabolic processes in biological systems. The latest application of this technique is in penicillin research, where the mould is made to incorporate a sulphur isotope into the penicillin molecule. Rowley and colleagues,[5] while investigating the glutamic-acid uptake by bacteria, used a preparation of radioactive penicillin, made by inoculating a synthetic broth medium containing S^{35} with a vegetative culture of the Q176 strain of *P. chrysogenum*, in which the sulphur content had been reduced to a point at which it became the limiting factor in the yield of penicillin. The yield from 2 ml. of broth was 250 I.U., representing a 12% conversion of the sulphur in the broth into penicillin with a specific activity of 0·05 microcurie per I.U. It was noted that the presence in the medium of 50 millicuries of S^{35} per litre did not adversely affect the growth of the mould. A preparation of radioactive penicillin with a much weaker activity has recently been reported[6] from the United States. With their radioactive penicillin Rowley et al. demonstrated that the absorption of penicillin, if any, probably amounts to less than 10 molecules per bacterium (*Staph. aureus*).

Extending this work on penicillin labelled with S^{35}, Rowlands, Rowley, and Stewart, in this issue, report some excretion and absorption studies in cats. By giving mixed ordinary and labelled penicillin intramuscularly they found that 100% of the radioactive sulphur isotope was excreted in the urine, but the recovery of biologically active penicillin was much less. There was no evidence of any retention in the body, as the radioactive breakdown products (at present unknown) were excreted over the same interval of time as the penicillin itself. In a previous study of the absorption of penicillin given by mouth, Stewart and May[7] concluded that "the most important factor influencing the absorption of penicillin seems to be the unexplained that the drug might have some effect in myelomatosis which is also characterised by disturbance in plasma proteins. SNAPPER[10] has recently reviewed his results on 35 patients. The drug is given intravenously and a course of 15–20 injections of 150 mg. is needed. The doses are given daily unless there is renal damage when they are spaced out to twice a week. The diet has to be controlled and animal protein kept to a minimum. A troublesome side-effect is a dissociated anæsthesia in the area distribution of the trigeminal nerve, which often appears one to three months after the course of treatment. SNAPPER estimates that in four-fifths of his patients bone pains were relieved and the disease arrested; "arrest" is the correct term, for X-ray changes remain stationary and serum protein may remain high. Most of his patients relapsed within a year and did not respond so well to second courses of stilbamidine. Of the 12 patients who had been under observation for more than a year after treatment, 4 had died and 5 were classed as satisfactory and were ambulant; 5 of the 8 survivors had lived for three years since diagnosis and one for six years. SNAPPER and his co-workers showed that in patients with biochemical evidence of disturbed protein metabolism basophil bodies appeared in the cytoplasm of the marrow plasma cells when the stilbamidine dose had reached about 1000 mg. Histochemical spectrophotometric studies suggest that these are composed of ribonucleic acid and stilb SNAPPER suggests that the myeloma cells abnormal nucleoproteins in their cytoplasm, and stilbamidine has a specific affinity for them. amidine is far from the ideal therapeutic agent myelomatosis, for its action is only partial and unpleasant side-effects, but groundwork for ment has been laid by SNAPPER and we must that more effective compounds will be If the apparently solitary myelomas are really of a generalised disease, then the present by surgical removal and subsequent local therapy might appear wrong. GOOTNICK[11] has that there are few survivors after ten years But practice there have been many reports of surviv some years without evidence of general spread, operation may be needed to relieve mechanical ability. Perhaps evidence of extensive spread sternal marrow should be a contra-indicatio operation.

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[1] Hevesy, G. *Biochem. J.* 1923, 17, 439.

[2] Joliot Curie, I., Joliot, F. *C.R. Acad. Sci., Paris*, 1934, 198, 254.

[3] Tarver, H., Schmidt, C. L. A. *J. biol. Chem.* 1939, 130, 67.

[4] Hahn, P. F., Balfour, W. M., Ross, J. F., Bale, W. F., Whipple, G. H. *Science*, 1941, 93, 87.

[5] Rowley, D., Miller, J., Rowlands, S., Lester-Smith, E. *Nature, Lond.* 1948, 161, 1009.

[6] Howell, S. F., Thayer, J. D., Labaw, L. W. *Science*, 1948, 107, 299.

[7] Stewart, H. O., May, J. R. *Lancet*, 1947, ii, 857.

Here then is another condition in which im diagnostic methods have made earlier di possible, for which effective therapy is being devel and which is passing over from the surgeon's physician's care.

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[10] Snapper, I. *J. Amer. med. Ass.* 1948, **137**, 513.

[11] Gootnick, L. T. *Radiology*, 1945, **45**, 38

Annotations

PRIVATE PATIENTS NOT ADMITTED

IN a speech reported on p. 515 Mr. Bevan expressed great satisfaction at the fact that 92–93% of the population of Great Britain have already chosen their doctor in the National Health Service, and said that signatures are still coming in at the rate of 150,000 a week. Enrolment has indeed been far speedier than was expected. In view of the general reluctance to fill in forms of application for licences, ration books, and the like, it would not have been surprising if many more people had put off choosing a doctor, or joining his list, until the onset of illness made this imperative. Even if the rate of new entrants falls steadily from now onwards, it is very likely that by the time the winter illnesses have come and gone no more than 1 in 40 or 50 will remain outside the general-practitioner service.

This bears out our contention of a fortnight ago that the number of people who might wish to attend health centres as private patients will be very small. Some private patients will be under the care of doctors who have not taken service under the Act; others will have elected to remain private patients specifically to avoid ever going to see their doctor; not a few will be elderly people, many of whom are reluctant to change their habit pattern or to risk any alteration in their lifelong relationship with their doctor. When all such are excluded we are left with an almost negligible proportion of patients who while remaining private might want to pay an occasional visit to the health centre. On an average through the country this proportion is scarcely likely to be as high as 1% (or 40 patients among the 4000 of a fully extended practitioner). Though there will of course be areas with abnormally large numbers of private patients, these will seldom be the ones first chosen to have health centres.

Nevertheless it seems that the Minister remains convinced, as a matter of principle, that private patients must be excluded from the use of health centres—even if this ruling means that the construction of some of projected centres will be halted. In this he is by Mr. Somerville Hastings. The *Times* on Sept. 10

> "The doctors have been told that they must not private patients at a health centre provided by the authority. This is a blunder. Specialists are to be to carry on private practice at State-provided yet general practitioners are to be denied similar pr at State-provided health centres. All private p perfectly eligible to benefit from the facilities of the service and, as taxpayers, they are part-owners of the in which the work of the service is done. Why should not pay for what in any case they are entitled to get fr

Mr. Hastings on Sept. 15 replied that if the patients "are intelligent people, they would only be seen privately and pay for it if they expected to either preferential, more considerate, or better treatm And this is what they would be bound to get, so there would be two standards of treatment in the health centre." But is this theoretical reasoning by experience? In actual fact people who have el to remain private patients still seem to be content attend for some services at their doctor's surgeries, ask there no preferential attention, nor any more c siderate or better treatment than that being given to State-enrolled patients. The truth seems to be that great majority of patients remaining as private pati do so in order that they may suit their own convenie as to when, where, and how often, they consult the doctor. For certain services (e.g., recurrent minor dressings, vaccinations, ear syringing, the of priority certificates, or the obtaining of sign passports and other documents) it generally suits patients to come at a fixed, and early, time to their rather than wait indefinitely at home for his Why should they not seek similar services in a h centre? No more than now will they need or ask special attention.

If a doctor had any substantial number of patients, the fact that these were denied entry to health centre might in the end prove prejudicial to the Sabbatsberg Hospital in Stockholm. The riority of this machine lies in the excellent oxygena- which is obtained by spinning a row of plates which into a trough of blood, and so expose constantly nging thin films of red cells to oxygen (or anæsthetic s if required). On the mechanical side the machine owes h to the work of Andersson, who was also responsible the engineering aspects of the spiropulsator, which fessor Crafoord uses so successfully for giving anæs- ics during thoracic operations. The oxygen uptake he blood in Björk's apparatus is much better than ny previous machines, as much as 110 ml. of oxygen g added to each litre of blood per minute. Heparin lded to prevent clotting, but careful filtration of the d returning to the animal is essential to avoid olic complications. There is a considerable break- n of red cells in such a machine, but it has been orated sufficiently to maintain the oxygen require- its of the brain of a dog for half an hour. It is wn that the aorta can be clamped distally to the left lavian artery for half an hour without any significant nage to the lower half of an animal, and thus by oping the venæ cavæ the heart can be opened tively bloodlessly.

he aim of these experiments is to isolate the human rt from the circulation while it is opened for operative edures. This new work is a great step forward, but eaves us a long way from this goal. This year an rnative approach has been exploited by Holmes ors[4] and Brock[5] in their operation for the relief of monary stenosis. Both have successfully thrust an rument through the wall of the right ventricle and lded the constricting diaphragm in the beating heart.

VETERINARY PROGRESS

HE annual congress of the National Veterinary dical Association, held at Southport from Sept. 8 .15, once again illustrated the similarity between erinary and human medicine in the urgent problems the moment. Tuberculosis, virus diseases, and monella infections are all exercising the minds of se responsible for the control of communicable eases, whether in animals or in man. Prof. T. Dalling, o became Chief Veterinary Officer in August, discussing control of tuberculosis in cattle, emphasised that e of the chief difficulties in tuberculin-testing is non-specific sensitisation to mammalian tuberculin. eps are being taken to increase the specificity of the mparative intradermal test, in which avian and ammalian tuberculins are injected simultaneously at fferent sites and the reactions compared. Extensive periments done on the specificity factors of P.P.D. berculins produced from different acid-fast bacteria ve shown that twice as much avian P.P.D. is required elicit the same reaction in bovine sensitisations as human; Green suggests that for this reason bovine P.D. might be more useful in the comparative test r distinguishing between specific and non-specific fections in cattle. Work is also being done on the emical modification of tuberculins. In a large-scale ld experiment the double intradermal test as usually rried out proved to have no advantages, but workers Northern Ireland have shown that 7 days after the jection of tuberculin the site of injection develops an hanced specific sensitivity. Less laborious and more ecise methods of detecting bovine tuberculous infection cattle may arise from this work, but already the option of the single as opposed to the double intra- rmal tuberculin test has greatly increased the amount testing that can be performed. Professor Dalling ged the importance of suitable callipers for measuring skin thickness, and now that these are obtainable they should be widely used by the Ministry's whole-time and part-time staff. There are now over a million cattle, or 13·9% of the total cattle population, in attested herds and 250,000 in herds licensed to produce T.T. milk, but various speakers demanded a more vigorous policy of eradication.

The salmonella organisms responsible for bacillary white diarrhœa in poultry and fowl typhoid seldom cause disease in man, but various new salmonella types which may cause food-poisoning in man have lately been isolated from fowls, eggs, and animals. It has been shown, too, that salmonella infection in cows and calves is commoner than was generally realised.[1] In poultry, salmonella infections call for an organised programme of agglutination-testing and attention to incubator hygiene. Incubator infection is the chief method of spread through setting eggs, the shells of which are infected by fæcal contamination. Mr. J. E. Wilson, who discussed the control of these infections, described the technique of incubator fumigation in detail; to forestall shell penetration it should be carried out as soon as possible after setting. In large outbreaks he recommended sulphonamide therapy in conjunction with other measures. Organisms which are sensitive to sulphonamides, or to one of the antibiotics, will of course be equally so, whether they are infecting man, animals, or birds; but the behaviour of the antibacterial drugs differs considerably in different species owing to variations in absorption and excretion. Thus Mr. J. Berger and Mr. J. Francis showed that, in domestic animals, 'Sulphamezathine' gives consistently higher blood-levels than equal doses of sulphadiazine; whereas in man the reverse is true.[2]

Mr. Horace Thornton, chief veterinary inspector, Newcastle-on-Tyne, contended that the standards of meat hygiene, inspection, and control are much lower in Britain than in Continental and other countries where the veterinary profession has taken a greater part in the work. He advocated routine bacteriological examinations in the inspection of borderline carcases and a greater use of biochemical tests. The adoption of such methods would result in the release of many of the carcases which, in Britain, are now totally condemned. The criteria now applied in Germany in relation to tuberculous carcases deserve critical study. Some of his specific criticisms are set out by Mr. R. F. Montgomerie, PH.D., the association's president, in our correspondence columns. With regard to home-killed meat, however, Mr. Harry Priestley[3] says there is no cause for alarm. It is a pity that animals are rarely inspected before slaughter in Britain, although many diseases which are difficult to detect in the dead animal can readily be diagnosed in life. Several speakers regretted that the Ministry of Food has not regularised the slaughter of horses for food.

Encephalitis is as complicated a subject in dogs[4] as in man. Mr. A. B. MacIntyre, Dr. D. J. Trevan, and Dr. Montgomerie showed that apart from dietary and miscellaneous causes canine encephalitis is sometimes associated with canine distemper and with a newly recognised virus infection which causes a characteristic thickening of the pad epithelium.

On Sept. 10 the association visited Liverpool University and its Veterinary Field Station, where Prof. J. G. Wright described the techniques for cæsarean section in the cow. In his view the incision should be made just to the left of the midline, and not in the right flank. Despite the weight of the abdominal contents he has not been troubled by postoperative rupture.

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[4] Sellors, T. H. *Lancet*, 1948, i, 988.
[5] Brock, R. C. *Brit. med. J.* 1948, i, 1121.

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[1] Field, H. I. *Vet. J.* 1948, 104, 251.
[2] See *Vet. Rec.* 1947, 59, 131; *Vet. J.* 1947, 103, 193.
[3] *Manchester Guardian*, Sept. 18, p. 4.
[4] Parry, H. B. *Vet. Rec.* 1948, 60, 389.

individual variations in the absorptive capacity of the gut." Stewart and his colleagues have now produced evidence supporting their previous contention. When the radioactive penicillin was given to cats by mouth, the urinary excretion of radioactivity was no longer complete as when the penicillin was given intramuscularly, but was reduced to 54–24% of the initial dose, while the proportion of biologically active penicillin excreted in the urine was even considerably less than this. In one cat only 24% of the original radioactivity had appeared in the urine, and as much as 59% was unabsorbed, being recoverable from the gut contents post mortem. In this case urinary excretion had not ended, but the presence of such a large percentage of the original activity in the gut after six hours strongly suggests that non-absorption from the gut is the reason for the low urinary excretions after oral penicillin. It seems, then, that attempts to improve the absorption by this route are still worth while.

MEMORANDUM ON RH FACTORS

THE doctor who studies recent reviews and pronouncements on the Rh factor may well despair of ever understanding this example of what Lord Samuel calls "the unceasing elaboration of human knowledge"; the rows of rival symbols, the genetic terminology, the "blocking" antibodies, all combine to bewilder him. Yet for the sake of his patients he must understand the practical application of this new knowledge. He will be greatly helped by the brief, informative, and inexpensive summary published this week by the Medical Research Council.[1] Without shirking descriptions of the more difficult points, this memorandum presents a clear picture of the clinical consequences of neglecting the Rh factors, and it puts subjects like the Rh subgroups and the peculiarities of Rh antibodies into their proper perspective.

After a very short historical introduction, the first section, by R. R. Race, describes briefly the various Rh groups. He points out that 95% of all dangers due to Rh blood-groups are due to the original Rh group now known as D and its antibody anti-D, and he quotes the latest figures showing that in England 83·2% of the population are Rh-positive (D-positive) and 16·8% Rh-negative. There follows a brief but thorough description of the Rh subgroups and their genetic relationship according to the ideas of R. A. Fisher. Race rightly says that anyone who makes the effort necessary to master these groups has, at the same time, achieved at least an elementary knowledge of human genetics in general. In describing the Rh antibodies the term "blocking" antibodies is dropped, since it is not clear that this is, in fact, the action of these antibodies. What is known is that anti-D, the commonest Rh antibody, exists in two forms; one form will agglutinate red cells containing the antigen D (D-positive cells) when these cells are suspended in saline solution, whereas the other will agglutinate them only if they are suspended in a protein medium—best results are obtained with 20% bovine albumin. Cells exposed first to this albumin anti-D will not subsequently be agglutinated by the saline antibody; hence the term "blocking" or incomplete antibody. But when Diamond gave intravenous injections of Rh-positive blood to Rh-negative male volunteers, he found that the saline agglutinins appeared first, and that then with repeated doses they diminished and eventually completely disappeared, being replaced by a rising titre of the antibodies detectable only in albumin suspension. Diamond therefore regards the albumin antibodies as "hyperimmune agglutinins." The authors of the M.R.C. memorandum adopt the noncommittal but tive terms "saline" and "albumin" agglutinin antibodies.

In the second section P. L. Mollison deals with considerations and covers more familiar ground. details how immunisation to Rh can be produced transfusion of Rh-positive blood into Rh- persons or by a pregnant Rh-negative woman Rh-positive fœtus. A less well-known fact is that intramuscular injection of blood—e.g., for can produce life-long immunisation. Mollison the importance of detecting Rh antibodies in the blood, since this is the best indication that the may be affected by hæmolytic disease. Two tions should be made, one early in pregnancy and about six weeks before the expected date of the first examination reveals sensitisation before pregnancy, since antibody developing for first time during a pregnancy rarely shows before fifth month. The clinical pictures of hæmolytic and of the allied syndromes are described, and the means of dealing with the situation and the advising parents about future pregnancies are discussed. The technical details of exchange fusion provide useful practical points for workers maternity hospitals.

Clinical laboratories are not at present enco to undertake Rh testing, and the regional laboratories do most of this work. However, clinical pathologists may be interested in doing own, especially if they are in situations distant from regional centres. They will obtain compr help from the third section, in which A. E. fully sets out the practical details of Rh Altogether this is a highly valuable and aut addition to the M.R.C. series of White Memoranda.

THE ARTIFICIAL HEART

ATTEMPTS have been made since the turn of century to devise a machine which would perform circulatory duties of the heart. Twenty years ago and Schuster[1] showed that this could be done, and perfusion pump that they devised and demons at University College, London, is still in use. when, in addition, physiologists sought to oxyge the blood mechanically outside the body, the task be much more complicated. So far the only fully effic oxygenator has been the isolated lungs. Some of earlier attempts at artificial oxygenation now seem rath crude; hydrogen peroxide and oxygen have injected into the blood-stream, while oxygen-carry solutions of various kinds have been tried. The intr venous injection of oxygen, unless performed slowly, carries a severe risk of embolism. A differe type of experiment followed the demonstration Hartridge and Roughton that hæmoglobin would take oxygen much more readily in solution than when enclo in the red cells. But as would be expected, anim perfused with solutions of hæmoglobin rapidly died. the hæmoglobin passed into the urine and lymp Further attempts were based on the principle by nature in the lungs—the exposure of a thin film red cells of large surface area to oxygen. Perhaps most outstanding experiments were those by Bar and his co-workers[2] and later by Daly,[3] but neither their thin-film methods was suitable for mainta an animal for long.

The recent advances in intracardiac surgery stimulated renewed interest in cardiop machines. In this issue Dr. Björk describes which has been evolved in Professor Crafoord's

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1. The Rh Blood Groups and their Clinical Effects. By P. L. Mollison, A. E. Mourant, R. R. Race. M.R.C. Memo. no. 19. H.M. Stationery Office. 1948. Pp. 74. 1s. 6d.

1. Dale, H. H., Schuster, E. H. J. *J. Physiol.* 1928, 64, 35
2. Bayliss, L. E., Fee, A. R., Ogden, E. *Ibid*, 1928, 66, 44
3. Daly, I. de B., Thorpe, W. V. *Ibid*, 1933, 79, 199.

Medical Supervision in Industry

H. A. DE BOER, of the International Labour , said that international conventions are a stimulus tional legislation. Before the Medical Examina- of Seafarers Convention in 1921, only six countries egislation protecting seamen, but the convention d nearly all countries to adopt protective legislation. dical supervision of the worker is being developed any countries, and in most of Europe and in the . it has reached a high level of efficiency. The ulties of the pioneer in industrial medicine in Western tries have been slight, however, as Dr. H. P. DASTUR ed, compared with those now being experienced he few men and women interested in industrial cine and nursing in countries like India, with their l differences and illiteracy.

European countries perhaps the greatest remaining ulty is the discontinuity in the medical services for ers at different ages. Most of them have established ol medical services, but these still need to be grated as part of the child's school life and continued ugh the years of adolescence in industry and merce. The vast amount of non-absent morbidity ng adolescents is seldom realised.

r. W. G. DONALD (U.S.A.) gave an account of the ersity of California's student health service, which a lavish scale. If the American adolescent coming privileged homes is in such need of help, the opean adolescent coming from less privileged homes earning his living must need much more. Here is of the opportunities of the county colleges, which, er the Education Act, 1944, will shortly be established npulsorily in Great Britain. Adolescents dispersed large number of small factories will, for one day a k, be collected into a functional group which could be ject to guidance and medical supervision. Mr. F. W. , headmaster of a day continuation school, laid at emphasis on the fact that if " black-coated workers not to be superior to black-handed workers " both schoolmaster and the doctor have a great part to in building up group morale. Elaborate schemes the examination and treatment of adolescents are little importance compared with the feeling that the ctor and nurse, working either in industry or in a unty college, are part of the adolescent's life.

Incentives, Job Adjustment, and Absenteeism

Prof. ELTON MAYO (U.S.A.), in a paper read by his ughter, pointed out that labour is more than a number individuals collected together. The great significance the Hawthorne experiment and subsequent experience that economists and others have failed to grasp the fect of group influences on the individual. The dividual worker is a member of a team, and statistical udies on the frequency of absence show that the rgest class is composed of those who have not been bsent at all.

Dr. T. M. LING traced the effect of psychological causes rising within the individual, which help or hinder his djustment to a social group. In a later discussion everal speakers supported Dr. Ling's plea for closer and ore extensive study of personality variations.

Dr. F. R. GRIFFIN dealt with the problem of morale, articularly in small factories. Morale cannot be onsidered as an isolated factor, for it is one that arises om the total situation.

Dr. OSWALD SAVAGE's paper, though limited to the iscussion of rheumatism as a cause of industrial dis- bility, reminded delegates, who up to now had been onsidering psychological or psychosomatic causes of bsenteeism, that a large amount of disability is caused y organic diseases, particularly those of a chronic ature.

Other speakers gave accounts of their personal experiences and methods they have adopted to reduce absenteeism. The very good results they claimed were generally felt to be a tribute to their enthusiasm rather than to the particular methods.

Work and Skill

The discussion on this subject showed a big difference in the Continental and British approach. The former, very similar to the American, places emphasis on job analysis integrated with personality profiles ; the latter approaches human relationships in industry from a sociological and anthropological point of view. The British regard the promotion and maintenance of morale as of greater importance than the technical efficiency of the worker, with or without a machine.

Sir FREDERIC BARTLETT described the development of skill, which consists in a sequence of responses subject to psychophysical or mental control and which sets out to achieve an object. The most promising approach to an understanding of practical mental skill lies in a controlled study of the conditions, both individual and social, which lead to the formulation of programmes, and of how these can be revised and altered and yet kept in touch with rapidly changing circumstances. As Mr. P. A. D. GARDNER and subsequent speakers emphasised, physical skill reaches its highest form in craftsmanship.

Dr. A. T. M. WILSON urged that doctors working in industry should be better trained to integrate the contributions of workers in other fields of social sciences.

Health and Disability

Against the background of Dr. G. E. GODBER's description of the National Health Service, delegates discussed the development of health clinics in industry and the part that medical supervision plays in the successful employment of the limited or disabled employee.

Dr. F. E. POOLE (U.S.A.) spoke of the need to emphasise not the disability but the ability of each patient : the whole personality, rather than a specific disease or disability, has to be assessed, expressed in simple terms, and related to a flexible system of job classification. The importance of this was apparent in Prof. TOM FERGUSON's account in the employment of disabled persons in Hillington. Details such as lavatories with hand-grasps for use by men without legs are important if disabled men are to feel personal independence within the factory. The success of such experiments is to be judged with the regularity of attendance (at Hillington only 5·7% of working days are lost from all causes of absence), economic production, and the development of social and extra-industry interests among members of the group. The fact that a factory is an economic success is important from the purely productive point of view, but more important because of the feeling of usefulness it gives to disabled persons.

Dr. LOGAN thought that many of the systems of estimation and classification of disablement place too much emphasis on surgical disabilities : in view of the large numbers of persons suffering from peptic ulcers, chronic bronchitis, and degenerative conditions, more attention should be paid to the medical aspects of disablement.

Dr. L. ROCHE (France) in the closing paper, emphasised that production can be considered an index of health and well-being in its widest aspects.

Hazards of Particular Industries

Dr. J. GREGORY, who read Dr. GEORGE FLETCHER's paper and amplified his remarks on byssinosis in cotton workers, pointed to the need for studying the early development of pulmonary symptoms among such workers.

INTERNATIONAL CONGRESS OF INDUSTRIAL MEDICINE

Last week we briefly described the opening meeting at which Lord Moran, P.R.C.P., presided and the 900 delegates from more than forty countries were welcomed by Mr. George Isaacs, Minister of Labour, and by Mr. T. E. A. Stowell, F.R.C.S., first British president of the Commission Internationale Permanente pour la Médecine du Travail. Mr. Stowell paid a special tribute to the work of Prof. L. Carozzi, who was responsible for forming the commission in Milan in 1906 and has been its secretary-general ever since.

The following report describes some of the many sessions held from Sept. 13 to 17. At a crowded final session Lord Webb-Johnson, P.R.C.S., presided, and Mr. G. R. Strauss, Minister of Supply, gave the closing address. Prof. P. Mazel expressed the thanks of the delegates for the hospitality of the British Council, and said that the health happiness of the workers in this country is an exp of national well-being and an achievement of industrial medical officers, nurses, managers, and working in industry may well be proud.

Social events included a big Government at Lancaster House on Tuesday, and a reception by Royal College of Physicians on Friday evening. the same day Mr. H. E. Griffiths delivered at House the Mackenzie industrial health lecture, e The Surgeon in Industry. During the present the visitors, in small groups, have been visiting tories, institutions, training centres, and ind undertakings of many kinds in England, Wales, South-west Scotland.

The Law

A session on the industrial medical content of the law produced a vigorous discussion. After Mr. MOELWYN HUGHES, K.C., and Dr. P. PRINGLE had described the English law relating to industrial medicine and compensation, Prof. L. CAROZZI (Italy), the chairman, dealt with current industrial legislation in other countries. Everywhere, he said, the application of labour legislation meets with difficulties, as shown in the reservations made by the committee of experts of the International Labour Organisation on the application of conventions. It needs good will on the part of governments, employers, and workers to attain the aim of such legislation, which is the common good and the team spirit. He thought that laws relating to health and hygiene should be revised and codified; often the regulations are too numerous and sometimes they are contradictory. Today social-security laws tend to embrace both compensation and the prevention of accidents and industrial diseases, a state of affairs which makes the application of industrial legislation more complicated. In fact the medical supervision and prevention programmes allotted to social-security departments encroach on the rights and duties of the technical and medical factory inspector and of the works medical officer. Though the legislators envisage a permanent liaison between the two functions, the methods adopted are not satisfactory. He instanced the difficulty which French workers encounter in obtaining compensation, because industrial diseases have been too precisely defined; the social-insurance department has plenty of money which is not distributed in compensation as it ought to be.

Dr. I. URBANDT (Argentine) read a paper on the regulation of hygiene and safety in factories, and Dr. CATHERINE SWANSTON reviewed the protective legislation for women and young persons in industry. She said that the factory inspectorate, established in 1833, is responsible for much reform of the hours of work of women and young persons, but even now the law as it stands in relation to their employment is in many respects out of date, illogical, and uneven in its application.

One of the main points arising in the discussion was whether compensation laws should be general, with details in more flexible codes, or whether the compensatable illnesses or accidents should be precisely defined and scheduled as in the French and in a lesser degree in the English law. Some speakers feared that if the compensation laws were interpreted in a flexible manner the workers might exploit the compensation funds, but others saw little risk of this provided careful medical examination establishes that the morbid conditions are directly due to the occupation.

Organisation of Industrial Medical Services

Prof. P. MAZEL (France) reviewed the organisati industrial medicine in France and pointed out th a law passed in October, 1946, all establishments, soci and associations employing paid workers, wha their number, must arrange for medical services for workers. Any registered doctor may be chosen by employer or industrial committee to carry out the d his payment being made at a standard rate by employer. The doctors' duties consist in the examin of applicants on engagement and also the per medical examination of all workers at least once a and more often when the worker is under 18 years age or engaged in dangerous work. Dr. Mazel described the administration of this service, which i effect a national industrial medical service.

Dr. L. GREENBURG (U.S.A.) discussed the indus health services in New York State, where there a 52,000 factories in which nearly 2 million workers a employed. Supervisory work is in charge of the Depa ment of Labour and is carried out by a factory inspect service and by the division of industrial hygiene and safety standards. The licensing of industrial med bureaux and of physicians for industrial practice i vested in the workmen's compensation board of t State. This board is also in charge of the adjudicat of compensation claims for industrial injuries and occupational diseases. Labour unions, by establishing clinics, by including health provisions in labour contracts, and by programmes of health education, greatly strengthen the movement for improved health among workers. Voluntary health agencies also play a part The United States Public Health Service, through the division of industrial hygiene, has conducted research, has aided State units in the conduct of their work, and has provided funds and personnel for developing industrial medicine.

Dr. A. BRUUSGAARD spoke on the industrial medical services in Norway, which cover 17% of the employees in industry, commerce, and transport (exclusive of shipping).

Almost all firms of more than 500 employees are covered, and a fifth of all firms with more than 50 employees now have a medical service. The scheme has been set up by a voluntary agreement between the Norwegian Federation of Labour, the Employers' Association, and the Norwegian Medical Association. This voluntary aspect is regarded as of the utmost importance, to ensure the development of a democratic system.

Dr. A. NYYSSÖNEN gave an account of the industrial health service in Finland, and Dr. N. L. LLOYD described the organisation of the British Ministry of Supply medical service.

g radiations; but a committee in the United have made some which they considered to be on fe side. For ordinary X rays and gamma rays the sible limit for exposure of the whole body was per week, measured in air; for exposure of the it was only 1 r. per week, and for exposure of the body once in a life-time it was 25 r. for persons years of age and 50 r. for persons over 45. For ry beta rays the limits are equivalent to the in terms of energy absorbed per gramme of tissue level of the reacting skin cells. For fast neutrons nits of exposure are related to a biological effective- ictor which is 10 when the measurements are made ms of energy absorbed in tissue; for slow and al neutrons the biological effectiveness factor is 5.

P. C. **Koller** described the chromosome fragmenta- nd the disorganisation of cell division caused by ig radiations from X rays, gamma rays, neutrons, lpha particles. The changes in the cells often in their death and cause lesions in tissues which ow in repairing. Controlled therapeutic doses of ion may be employed to destroy cancer tissues gh the damage induced in the mechanism of cell- on responsible for malignant growth. The changes ed by ionising radiation are not necessarily lethal e cell; it may be only the distribution of the nosomes which is altered. Tissues derived from cells will be abnormal in their genetic constitution. ng radiation may induce changes in the "gene." se occur in genes borne by the chromosomes of the or ovum they will be transmitted to successive ations and spread in the species. Experimental nce tends to show that in all living organisms ic or hereditary changes are induced by irradiation, hat man cannot be an exception. The magnitude e effects depends on the dose of radiation; these s are cumulative and can be mitigated only by ous protective measures. It is therefore not gh to confine such measures to the protection of iduals; the genetic well-being of future generations major issue which must be equally considered when ctive measures are devised.

. W. **Binks** spoke about the part played by the onal Physical Laboratory in safeguarding the health orkers exposed to radiations. The service offered ded examination of dental films carried by all sers exposed in factories and laboratories to radio- re materials and X rays. Experts from the National sical Laboratory go out and measure the actual ations in the workplaces.

r. L. H. **Gray** asked Dr. Failla what is the basis stimating the permissible doses of radiation and what the actual absorptions by human beings as opposed animals in experiments. He thought that care ld be taken that the limit is not put too low. He asked whether skin cancer from radiations can arise hout there being any previous burn of the skin. eply, Dr. **Failla** instanced the case of a technician whom blood changes began within two years of sure to an estimated radiation of 1 r. per day. is opinion a limit of 0·3 r. per week is not too low. cancer can arise without previous burning of the .

r. **Ethel Browning** asked about the effect of ll doses of radiations. In her examinations of the d of all luminisers in the country, whose exposure found to be low, it appeared that there was a ulating effect on the blood from small doses and that ous cells appeared in the blood picture which were the nature of immature monocytes. This effect eared to be transitory, for similar cells were not d in her follow-up examinations of luminisers who left the industry. Prof. J. S. **Mitchell** said these abnormal cells are difficult to classify, and we should lay stress on changes in total cell-counts rather than on counts of abnormal cells. He pointed out that skin cancers due to radiation appear on the dorsal aspects of the hands rather than on the flexor surfaces where atrophic changes occur. The time, he thinks, has come when the biochemists should become interested in the effects of radiation.

Mr. K. L. **Goodall** outlined the practical problems that arise in guarding workers in factories from the effects of radiation, and he mentioned the Luminising Regulations drawn up by the Factory Department.

Dr. J. J. **Nixon** (U.S.A.) regarded the blood-count as a frail reed on which to assay the chronic effects from radiations. So many things affect the normal blood-count. One should pay attention to the trends of the blood-counts and the trends of the blood pictures in groups rather than in individuals. Other methods of investigation need to be developed.

Dr. **Katharine Williams** thought it important to know the permissible limit of exposure in a life-time, particularly for workers engaged in screening in X-ray rooms; and Dr. W. C. Cox (U.S.A.) described how in the U.S. Army records of all X-ray exposures are kept so that more accurate knowledge may be obtained on which to lay down limits of exposure.

Disabilities

13. PULMONARY TUBERCULOSIS

During my first hospital appointment as a student I had a routine Mantoux test, which was negative. Four months later I had a series of hæmoptyses lasting a week, and a bad X-ray film did not show distinctly the lesion that was subsequently found in a much more advanced state. Three negative sputum tests and a normal sedimentation-rate, together with a normal axillary temperature convinced the senior physician that the blood came from my nose (not examined); and after a fortnight's holiday I returned to ward work. During the summer I continued with my athletics, representing my country, and in the autumn I started training for the rugger season, during which I was expected to get an international cap. However, the war began and I was put on night duty. My finances were not good, and I began to spend less on food so that I had more for Saturday nights after rugger.

Definite symptoms appeared eighteen months after I had gone to my hospital. I could not get "fit," my "wind" was not good, I had a pain in my left side, and I began to cough. There was quite a lot of purulent sputum, which I was assured came from my sinuses, so I had a submucous resection and antral puncture. Soon I noticed I was losing weight, had indigestion, and my temper was awful. I started nightmares and night-sweats, and my voice was husky all the time. The pain was now acute and did not respond to heat, so I saw a doctor who found signs of cavitation. When he screened me and said "There's a cavity as big as a golf-ball, with a fluid level" my first instinct was to escape—to join a ship, anything rather than face the facts. My medical student friends firmly made me stay in bed and arranged for my admission to my teaching hospital. The local tuberculosis officer called to see me and arranged for an X-ray examination of my friends. It was a great relief to learn that none of them had been infected.

In hospital I was kept on "absolute bed rest," which probably did more harm than good since I could not read for long, and when I did have visitors I got overtired and had a much higher temperature than usual. A lot of my time was spent in a trough of depression, thinking how I could prevent my friends at home hearing of my condition and how I could redeem myself for the awful

The risk of boot and shoe operatives catching tuberculosis depends on the spacing of workers on a factory floor; but Dr. ALICE STEWART's findings, which confirm the presence of a high incidence of tuberculosis in the Northampton boot and shoe trade, show the necessity for further investigations in other industries and more work on the epidemiology of tuberculosis.

Dr. PATRICIA SHAW pointed out that the gross mortality figures of shop assistants do not differ—except in specific instances, such as grocers—from those of the general public. A significant fact is the disappearance of men of the age of 30 and onwards from the distributive trades. She would like to think that this is because shop assistants become proprietors; but experience shows that this is not so. Probably, because of the frustrating nature of their work, shop assistants drift into other occupations. Much more study is required to decide simple problems such as whether the incidence of varicose veins is higher in shop assistants, who stand all day, than in other occupational groups.

Occupational Tumours of the Bladder

Prof. G. H. GEHRMANN (U.S.A.) described experiments on dogs confirming other work on the carcinogenic action of beta-naphthylamine; but no tumours could be produced with aniline, benzidine, and purified alpha-naphthylamine. Dr. G. M. BONSER spoke of her experiments on the induction of tumours with beta-naphthylamine, and confirmed hitherto uncovered results with the other amines. Prof. G. DI MAIO (Italy) from a considerable experience of these tumours, gave an account of the clinical and cystoscopic appearances, the highest incidence being among benzidine and alpha- and beta-naphthylamine workers. Prof. E. C. VIGLIANI and Dr. M. BARSOTTI (Italy) presented the results of observations among chemical workers from which it appeared that beta-naphthylamine and benzidine are both causes of tumours.

Dr. ACHILLES MÜLLER (Switzerland) summarised an experience of some thirty years in this disease, and indicated that the modern approach to manufacture, combined with routine cystoscopic examination, has led to its being mastered. Dr. CORNELIO BELLESINI (Italy) detailed a process of manufacture of benzidine in which workers have not developed any tumours even after twenty years.

The position in regard to these tumours in Britain was described by Dr. M. W. GOLDBLATT, who asked for an equitable system of compensation for workers who develop them.

Diseases of the Lungs

In a session on diseases of the lungs other than pneumoconiosis, Dr. T. A. LLOYD DAVIES described his clinical and experimental investigations into manganese pneumonitis, and Dr. K. M. A. PERRY read a paper on bagassosis.

Prof. A. POLICARD (France) spoke on his animal experiments on the effect of beryllium in the lungs. He found that beryllium sodium fluoride dusts provoke early and violent pulmonary œdema, resulting in death of the animals within 24 hours. Beryllium oxide dusts, on the other hand, cause hyperplasia of the mesenchyma of the lung tissue. Three types of reaction are found, the first being histiocyte pneumonia, the second granulomatous nodules, often with giant-cell formation, and the third cellular thickening of the alveolar walls. The granulomatous nodules seen after a few weeks' exposure persist for several months. Metallic beryllium and beryl do not seem to affect the lungs of animals.

Dr. E. H. SCHIÖTZ (Sweden) described the metal fever produced by copper dust. He preferred the name of "metal fever" to "metal fume fever" because in his experience the condition is produced by dust and not by fume.

The monocytic infiltration induced in animals' l by the introduction of manganese dioxide and bery oxide suggests that pulmonary lesions in men e to these dusts may be due to the same basic proc despite clinical differences. It seems, too, that b sosis, farmer's lung, broken wind in horses, and per byssinosis, have a similar ætiology, as allergic condi manifested as an acute bronchiolitis.

Toxicology

Dr. A. U. JORDI (Switzerland) gave an accoun psychic disorders in industrial poisoning and referre what he called a psycho-organic syndrome commo industrial poisoning by lead, mercury, and many o solvents. The main features, he said, are loss of me for recent events, slackening of all mental proc depression and narrowing of interest, nervous irritab rapid changes of mood, and insomnia. In me poisoning tremor is the most obvious symptom; progresses after removal to safe work, whereas in po ing by organic solvents the symptoms usually clear the exposure has been long and severe. The change best studied in carbon-disulphide poisoning. In treatment of the psycho-organic syndrome vitamin and C and also male hormone have proved helpful.

Dr. M. BARSOTTI and Dr. G. CROTTI (Italy) spoke epileptic fits in workers handling T.4. powder (methylenetrinitroamine), and Dr. R. A. MCFARLA Dr. NIVEN, and Dr. HALPERIN (U.S.A.) outlined a met for estimating the effects of various substances w interfere with the oxidated mechanisms of the cen nervous system. The method involves the meas ment and correlation of changes in light sensitivity various criteria through blood analyses.

Dr. M. GAULTIER (France) discussed the ocular dist ances in cases of poisoning with methyl bromide, Dr. A. AHLMARK and Prof. S. FORSSMAN (Swed read a paper on the testing of cerebral function by me of anæsthetics.

Atmospheric Pollution

Prof. PHILIP DRINKER (U.S.A.), in a paper wri with Dr. W. A. COOK, referred to the difficu in determining the maximum allowable concentra of atmospheric impurities. The determining proc he said, is an art rather than a science, and it would a serious mistake to consider any of the method accurate. Only a few substances, like carbon monox have such well-defined systemic effects that exposures can be laid down with a high degree of precisi Most others, like benzol and carbon tetrachloride, best into zones of toxicity. He set out six such zones a number of representative substances, ranging from th least harmful (like acetone) at concentrations from to 2500 p.p.m. to the extremely toxic, like radon gas at concentrations below 0·1 p.p.m. He believed tha this classification of contaminants should help in th understanding and control of industrial health risks.

Mr. N. STRAFFORD discussed the determination of toxic substances in the air; Mr. C. N. DAVIES reviewed the history of fibrous dust filters; Prof. J. TEISENG and Dr. B. SOUČEK (Czechoslovakia) described inhalati experiments designed to determine the absorption and excretion of carbon disulphide; and Mr. H. H. WATSO dealt with the physical properties of industrial dust

Radiant Energy

Dr. HERMAN LISCO (U.S.A.), speaking on the potential hazards and pathological aspects of radioactive isotopes said that more use of radiant energy will in future b made by private research laboratories, governmen agencies, and in industry arising out of the peace-tim developments of atomic energy.

Dr. G. FAILLA (U.S.A.) pointed out that it is hard to establish accurate limits for permissible exposure t

In England Now

unning Commentary by Peripatetic Correspondents

E danger of not being accepted as medical students r troubled us in the bad old days. So long as we l produce evidence of average scholarship and a *master's testimonial* we were *reasonably certain of* ace. My year did, however, spend an anxious and uncomfortable Registration Day. We attended at *appointed time and soon the waiting-room* was ed with would-be students. Slowly and at first reasonably orderly manner we passed one by one the Dean's office. Then the rumour started—that a limited number of students would be accepted, first-come first-served basis. Instantly there was s, and most of us packed into the corner of the a nearest to the Dean's door. We stayed like this several hours, a sharp struggle for priority breaking each time the door opened.

he danger of non-acceptance may have appeared real to us at that time but it was a ridiculous and gnified performance. The female applicants and a lful of older men stood aloof from the mêlée, and, y years later, one of the latter told me how he had ed the scene with near incredulity, wondering how earth this pack of rowdy youths could possibly be sformed into responsible doctors in the short space x years. As an observer within the group he could y us closely as awkwardness left us, poise and confidence grew, and tidiness of dress began to me some importance in our lives. He found the sformation astonishing.

a the modern sense we were not selected at all; were just a group of middle-class boys who were er clever enough to win scholarships or whose fathers e well enough off to send us through medical school. were a pretty average bunch, probably representative the usual intake at provincial universities. A few by the wayside and never qualified, but the proportion not high and I have yet to hear of a contemporary mine who can be regarded as a professional misfit. haps we were better than average or perhaps (dare hisper it?) the danger of wastage has been overphasised in an attempt to make the best of a situation ich current overcrowding has forced on us.

* * *

The following reflections on the Health Act should sung in a West Country dialect to the air of "Villikins d his Dinah."

When I were a boy I were not very smart.
So they takes me and learns me the doctorin' art.
A general practitioner is what I became
—Now I earns a good livelihood by signin' me name.

When volks comes to zee me because they veels wrong,
To wan o' these yur specialists I passes 'em along,
I writes 'em a sustifikit to say they'm diseased
And the patients and the Minister is vurry well pleased.

If yur boy bain't azackly, if 'e bain't vurry bright
You do what I tells 'ee and then you'll do right—
Jest send un and larn un thiccy doctorin' game
—An' 'e'll earn a good livelihood a-signin' 'is name.

* * *

Examinations are in the *news again. Candidates* iticise: Censors condemn. But I go on taking them. few nights ago the American Ambassador and I sat own to take the written part of the *Conjoint finals.* ust the two of us. The invigilator provided him with large quantity of paper and me with a pile of souplates. One cannot write rapidly or legibly *on a soup*late whichever way up it is and naturally the time pired before I had even completed one answer. Last ight I faced two examiners (one an old enemy of ine) across the green baize. He handed me a specimen. What is that?" he said. "It looks to me," I replied ithout hesitation, "like a piece of melon—or possibly," added as an afterthought, "paw-paw." He remained npassive. "You could not be further from the truth," e said, and walked out of the room. His co-examiner tared at the ceiling like the Frog Footman and said nothing. Once more the precious minutes ticked remorselessly by.

Before the trick-cyclists murmur condescendingly, "Elementary, my dear fellow," let me say that I have *no further examinations to take. Why then, should I* dream thus? Sometimes my pen runs out of ink; often I am disturbed and cannot concentrate; always the bell *goes before I have really started. A frightful thought* strikes me. Perhaps the Minister is planning a compulsory examination for all State doctors. But then, aren't all the best *soup-plates going for export?*

* * *

Finding a one-eyed man lurking in the hospital corridor I asked his business. In a Yorkshire accent he inquired whether I was the "vile diseases doctor." Ruefully admitting that I might be so described I was shown a *long-standing* ulcer of the leg, *one of a series of* gummatous incidents which were part of the man's very existence. He told me that he had been covering the ulcer with cobbler's wax and strapping it over with insulating-tape. Rather superiorly I informed him that modern treatment would soon take care of it if he attended very regularly. As it proved, he developed skin sensitivity to iodides, his oral condition limited the bismuth, and his dermatitic skin made one hesitate with arsenic. Penicillin was a disappointment and after three months the ulcer was as punched-out as ever and he was put on mercury as a last resort. During this time he had countless hospital applications and not a few of his own little-known proprietary unguents which on occasion I even had copied in the dispensary.

At last one day the ulcer showed indisputable signs of healing. "I knew it would, doctor," he said, "provided we had patience. But if I had been living in Hull it would not have taken a quarter as long." The last bit was rather a damper but I had to ask why. It appeared that some years ago when suffering from similar trouble he had taken his watch to be repaired at a shop in the back streets of that Yorkshire city. While he was inside the man behind the counter asked about his leg, inspected it, and announced that he could cure it in a fortnight. He retired to the rear of the shop and returned with some ointment in a boot-polish tin. The claim proved no idle boast and my patient had carried the ointment about with him for years as insurance against future trouble. He had finally surrendered it to his sister to cure a burn which was proving resistant to the machinations of her panel doctor. "I should never have parted with it," he concluded as he rose to go.

* * *

I was rather saddened by your correspondent describing how he had extracted a tooth. Out here in a Newfoundland outport (in Newfoundland outport means anywhere outside St. John's and corresponds to the provinces in England) I am 200 miles from a dentist, so I extract anywhere up to a hundred and fifty teeth a month. The difference between a doctor and a nurse is that a doctor is expected to be capable of doing a mandibular block. My patients order dentures from a mail-order firm in Chicago. They write away and are sent wax to take impressions themselves. Sometimes they come to me to do it for them. Sometimes the teeth fit, sometimes they don't. If they don't it's just too bad.

* * *

The misused idiom can also be amusing. M.O.: "Any serious illness?" Polish Fireman: "Noding sairioos—fifty-fifty ill sometimes." It seemed that "fifty-fifty" meant "slightly," for later, when I was testing his colour perception, he called the paler shades fifty-fifty red, green, or what have you; he also volunteered the information that his auditory meatuses might be fifty-fifty dirty, as he had been working in the pits recently.

* * *

> "SIR,—May I crave the hospitality of your columns to ventilate a point I was unable to thrash out owing to limited time at a recent meeting . . . ?"

Ventilation rather than castigation, by all means. But personally I prefer—if I have time—to nail my point to the mast and, with my back to the plough, steer my barque safely round Cape Metaphor and up the steep and thorny path until, at evenfall, I draw rein in the quiet reaches of Lunacy Verge Harbour.

crime of getting tuberculosis. I imagined myself an outcast, and it was not until my girl friend continued to visit me, despite all I did to dissuade her, that I realised the end of the world had not come. Eventually an eminent chest physician saw me, and at last the question of a sanatorium and the cost of treatment was raised. This was all taken out of my hands by my father, but I can imagine what a strain it could be for a less fortunately placed patient.

In time I was transferred to a sanatorium with my own room, and here for the first time I saw that one could get better. It was not that the will to get better had been lacking, but somehow one had never been given the prospect of a completely cured existence. My neighbour was a young man of similar age who had had tuberculosis before and relapsed, but was now improving. He gave me a new conception of tuberculosis—how one could live with the disease and what the limitations were. During his previous stay in the sanatorium he had wasted his time, but he was determined that this should not happen again; nor happen to me. Accordingly he argued with me on subjects I had hardly thought of, and made me buy new books on art, music, biography, and poetry. He insisted on my having a wireless set, and when eventually I got a gramophone with a lot of classical records and began to give recitals I realised how much I owed to his good advice: make the most of your time and you will not notice your illness. Furthermore, this interest in things other than sport broadened my outlook. That was before the days of art-therapy and most male patients did nothing except read detective stories. Those who were ambulant organised various communal activities and brought round the "glossy" magazines. Too much interest in communal activities is a bad thing, for it encourages the patient to feel he is important in his own little circle and to forget he has to live "outside." The "glossies" were a death symbol, the negation of all desire to get well and leave.

I had a successful artificial pneumothorax, but because of basal adhesions it was reinforced by a phrenic avulsion. The need for this had been carefully explained to me, as had the mechanics of collapse therapy, and I was beginning to take an interest in my A.P. rather than myself. This attitude is to be regretted, for patients become unduly alarmed if fluid forms and no longer consider themselves as a whole. Since my larynx was involved I was put on silence, which was very difficult to observe, especially when friends came to see me. I began to look and feel much better and to gain weight—but not self-confidence, so when I saw my parents for the first time since my diagnosis I was acutely embarrassed and felt very guilty towards them. They had been X-rayed by the authority that was paying for my treatment. I was very upset when told my brother had some infection, but a film six months later showed it had cleared up.

Life in a sanatorium, as in a gaol, imposes unphysiological restrictions, with the result that male and female patients develop "friendships" that will seldom withstand the trials of the outside world. Sometimes there is an engagement; and occasionally nurses, often tuberculous themselves, marry patients. This is a poor solution to the problem. At one time I got so immersed in the sanatorium life that I came to hate the visits of my girl friend because she symbolised the outside world with all its excitements and demands, to which I dreaded having to return.

One evening after a refill I felt rather breathless and found I had a temperature of 102°F. By the time I had called the nurse I was in great pain, hardly able to breathe, and when the doctor came I was collapsed. He immediately treated my spontaneous pneumothorax, and the next few days I was most unhappy though heavily "doped." Then followed three months' bed rest with *occasional aspirations*; but still the fluid formed, although my sputum had been negative since th was begun, the fluid contained tubercle baci quantity. Now began a period of uncertainty; I need a "thora" for my empyema or not? The said "yes" but the physician maintained there wa need in view of my good general health; so it was to wait and see.

A day came when I was allowed out of the for a walk. I set off at a cracking pace and w minutes was completely exhausted. This taught sharp lesson and I determined to find out the my exercise-tolerance. My resting pulse-rate wa and on mild exercise 100 per min. If it rose to 120 I very short of breath, but if it was higher than I simply could not move, however fast I tried to b This was a useful way of deciding whether I shoul with my walk or sit down and wait for my pulse fall. Naturally I was able to do more as I l adjusted.

When I left the sanatorium I spent some of my with a former patient and we both noticed how it was to find anywhere to sit down and rest, and tically impossible to stretch out at full length. H hotel lounges have I visited in search of a quiet when my rest hour was due! When a patient has left a sanatorium he gets tired very quickly with the of modern life; he develops a feeling of despair wishes vehemently to be back in his own cubicle, the old routine. At this period, unless he things quietly and is given a lot of enc he may relapse because of his inadequate adjustment.

Two and a half years after diagnosis I returned to in the wards, and I soon qualified. I have since four years of house jobs of every sort. I do not equal to general practice, because if I have to be night I get too tired to carry on.

My day is usually as follows: Get up at 7.30 eat a good breakfast and travel to my clinic, I write letters till 10.30 A.M. and then see patients 1.30 P.M. An hour and a half for lunch, and then, acco to the day, I either see more patients or go to a t hospital for a ward round. I always rest, lying flat 5.30 to 6.45 P.M., usually reading a medical book, in the evening, after getting supper ready for I read or write until 11.

I can play three sets of tennis (doubles) or run for a I enjoy swimming, cycling, and walking. If I do to much I get overtired, and, knowing the symptoms, take grain of sodium phenobarbitone, which gives me a night's sleep. When my rest hour is due and I am aw from home I never hesitate to lie on the floor—th most restful place—even if I am in a strange househo Every winter I develop a cough with mucoid sp which I have examined regularly. I carry a piece toilet-paper in my pocket to spit into, and throw it the fire after use.

I go every six months to the chest physician who always seen me, taking my latest X-ray film and result (never more than 4 mm.). Sometimes if I a cold and have "tuberculophobia" I go to be rea What do I fear most? A positive sputum, an of reactivation; sometimes when depressed I I am getting a bronchopleural fistula, infection of other lung, and secondary infection of the empye necessitating rib-resection, thoracoplasty, and ultimate amyloid disease.

Two years ago I married the girl who, despite difficulties, visited me regularly from my diagnosis. spent our honeymoon walking in Switzerland, going up to 7000 feet and once to 11,000 on the funical That, I felt, was the supreme test of my fitness rehabilitation.

en towards the preparation and serving of food rink in this country just so long will it be difficult luence staffs by propaganda. In Switzerland and countries where this attitude does not exist there rs less cause for complaint.

W. S. Parker
Medical Officer of Health.
ıer.

—In his letter of Sept. 11 Dr. Stanley Turner attention to the need for improvement in the *ng* of food if the spread of disease is to be avoided. I suggest that there is also an urgent need for ved *inspection* of food in this country. and for closer oration between medical and veterinary authorities is subject? I hope that means will be found to available to your readers the paper which Mr. ıornton, chief veterinary officer of Newcastle-on- submitted to the 66th Annual Congress of my iation. This paper, and the discussion which ed, provided ample evidence of how far we lag l countries such as Denmark, the United States, ermany, in matters of food-inspection, and of the r to public health which results.

ats which arose during the discussion included: osence of antemortem veterinary inspection of ıls, especially "casualty cases," which so frequently ur salmonella organisms; (2) the existence in ıplaces of a knacker's yard alongside an abattoir; e release to sausage-makers of meat only safe for fter-sterilisation by heat; and (4) the sale at od shops of uncooked meat, sometimes from ulous carcases, subsequently handled by the aser and occasionally even bought with a view to n consumption.

R. F. Montgomerie
President, National Veterinary Medical
Association of Great Britain and Ireland.
lon, W.C.1.

SUPERNUMERARY NIPPLES

—May I draw attention to a condition which has been osed as a supernumerary nipple by two experienced al men? During hot weather about three years ago le patient of mine, then aged 65, developed an ary yellow-headed pimple over his right breast. was "squeezed" and a small amount of pus was ıated. He subsequently developed a small keloid t the size of a pea at the site. I watched this from eginning and there is no question about it. It is superficial, freely movable, has no deep attachs and no areola, and the skin over it is quite smooth nothing suggesting the opening of any ducts. re its appearance the skin was quite normal at the of the keloid, which is not pigmented.

okwood, Surrey. H. M. Stanley Turner.

TRAMEDULLARY NAILING OF FRACTURES

R,—My experience of the treatment of fractures by medullary nailing consists of only 3 cases, operated h 1940, but it does explain my reluctance to use the hod now. The idea of using a long trifin intrafullary nail for a fracture of the shaft of the femur urred to me in 1939 after I had been using the Smithersen trifin nail for fractures of the neck of the femur. er all, it is really only an extension of Smithersen's original method of fixation. Messrs. Down s made the nails for me; they were 15 inches long, n in cross-section, and of stainless steel. The cases hich they were used were transverse or short oblique tures of the middle third of the shaft of the femur.

he main details and difficulties encountered were ollows. The fracture was reduced, using an orthoic traction table, and a lateral incision was made e the greater trochanter, so as to expose the superior ct of that structure, from which a circular piece of was removed to give access to the medulla. The nail was introduced as far as the fracture line under y control and then the difficulties started. It was atial not only to make sure of an almost perfect ıction in both planes but also to ensure that the ments remained reduced while the nail was tapped ss the line of fracture. The screening this necessid was very considerable and dangerous to the ator if repeated at all frequently. The alternative of repeated films in two places was also very tedious and time-consuming. I did not attempt an open reduction of the fracture because this was the very procedure I was trying to avoid.

I understand that in the case of a fracture of the femoral shaft an open reduction is now usually employed; but if this is so, it is much simpler to plate the fracture. If plates with slots instead of round holes (Egger's type) are used, subsequent impaction is not prevented and all the advantages of intramedullary nailing are obtained through a single incision.

Norwich. G. K. McKee.

BINOCULAR MICROSCOPES

Sir,—I should like to thank Professor Hartridge for his letter of Sept. 11 in answer to mine of Aug. 14. He confirms that the real basis of eyestrain is interference with the normal muscle balance, and that this covers the imbalance of which I complain in converging-tube instruments, which compel convergence in spite of the fact that one's accommodation is relaxed. I notice, however, that he is scrupulously non-committal as to whether the microscopist does work with relaxed accommodation. I am satisfied that he does though the object always appears to be about ten inches away (presumably as a result of the association of ideas). An observation that seems to prove this is that, if you use a low-power ocular to examine objects with which you are familiar, they look much farther away than with your usual ocular. It is easy to see, therefore, why many people have jumped to the conclusion that they are accommodating. When working with a monocular instrument the unoccupied eye will be found to be focusing far beyond ten inches.

That the eyestrain produced by my converging-tube instrument is not produced by vertical displacement is readily verified by the method I always use for testing binocular instruments. The instrument is focused with one eye closed, and then the closed eye (which need not be the master eye) is rapidly winked. This does not give the normal muscle correction time to operate, and the displacement of the images is clearly apparent. I have a pair of binoculars in which this vertical displacement defies all my efforts to correct it, and I can entirely confirm Professor Hartridge's observations about the resulting eyestrain.

London, W.1. J. W. Shackle.

SPONTANEOUS RUPTURE OF THE RECTUM

Sir,—Mr. C. P. Allen's report (Sept. 4) prompts me to record a very similar case seen in this unit.

On the afternoon of Nov. 27, 1946, a man aged 47, who was manipulating a heavy brake lever in a shunting yard, felt a sudden pain in the rectum and lower abdomen. He had a desire to defæcate, but was unable to do so. Next day he passed a normal motion, but the abdominal pain grew worse, and on Nov. 29 he was admitted to hospital.

He was now in great pain and was dyspnœic. Temperature 98°, pulse 100, poor volume. The abdomen exhibited poor respiratory movements, board-like rigidity, and absence of peristaltic sounds. Rectal examination revealed tenderness high up but no other abnormal finding. Laparotomy was carried out and turbid fluid escaped. The pelvic colon was found to be adherent about a large collection of solid fæces lying free in the peritoneal cavity. An oblique rent 2 in. long was found in the anterior wall at the pelvirectal junction. The descending colon was loaded with fæces. The rent was closed, the abdomen closed without drainage, and a left inguinal colostomy carried out. The patient made a good recovery; the colostomy was closed on May 7, 1947, and he is now fit and well.

The striking features of our case are the length of time between the rupture of the rectum and the patient's admission to hospital, and the fact that the peritoneal cavity had made an almost successful attempt to seal off the escaping fæces; no fæcal odour was noticed until the adherent loops of bowel were gently separated. As Mr. Allen says, the condition may not be as rare as has been supposed.

Arnold S. Aldis
Senior Assistant in the
Surgical Unit.

Welsh National School of
Medicine, Cardiff.

Letters to the Editor

M.R.C.P. EXAMINATION

SIR,—The M.R.C.P. examination has often been subjected to criticism, not only by rejected candidates but also by the comitia of the Royal College of Physicians. The organisation of the whole examination will no doubt be carefully reviewed in the near future. Any views which I express here are personal and not official.

I was Senior Censor in 1942–43 when the entries were approaching 200. Although this is far short of the present hordes, the problems arising were similar.

Two questions which appear in the recent letters have been repeatedly discussed—viz., the requirement before entry of certain resident appointments or of a minimal interval after qualification, and the length of the clinical examination.

Before the late war, the requirement of resident appointments would probably have had little influence on the number of entries, since nearly all candidates could have complied with it. It might involve some difficulties with candidates from overseas, and possibly at the present time with those from the Services, but these could be overcome. There does not appear to be any valid permanent objection, and there are arguments in its favour, apart from any effect on the number of entries.

The length of the clinical examination has caused much anxiety. The arrangements for holding this examination, even at its present length, involve a serious burden on the hospitals to which the Censors are attached. This burden falls especially heavily on the registrars. The necessary preparations are now so time-consuming as to interfere definitely with their normal duties. Unless the entries can be materially reduced it would be difficult appreciably to increase the length of the clinical examination.

The question of reducing the number of entries by some fair method merits study for this and other reasons. The aim would be to discourage the weaker group and the candidate who "has a go at it."

The rapid elimination of candidates after entry also presents difficulties. No trivial test would be satisfactory. "M.R.C.P." suggests that 60% should be eliminated by "stiff papers." This method would introduce a competitive factor which has always been carefully avoided. Further, by throwing the emphasis on a written examination, it would defeat "M.R.C.P.'s" object of a more critical clinical examination. It would almost ask for freak questions, which are the worst possible criteria. Elimination by the clinical examination is more in accordance with the tradition of the membership.

It should be borne in mind that reading membership papers is very exhausting. For a qualifying examination 8 or 10 papers per hour can be assessed, and the strain is slight. Few examiners can mark more than 4 an hour for the membership.

The theme that success in the examination depends on luck runs through many of the letters. I do not believe that there is more luck in the membership than in other comparable examinations. It is frequently asserted that men who pass after many attempts, or even consistently fail, are as good as those who get through without difficulty. This statement is undoubtedly incorrect. The evidence is that the good man gets through and the weak man fails, though anybody may fail once. In view of the high percentage of rejections it is striking how many candidates pass at their first or second attempt, and it is these men who supply the great majority of the future leaders of the profession. Shortly after the first war I was told the names of the four men who had earned outstanding marks in the previous 4 or 5 years, and I have remembered them. All four now have international reputations.

Candidates here as elsewhere can be divided into three groups. The first group is above the borderline area, and can take a piece of bad luck and pass in spite of it. Indeed if bad luck is represented by an obscure neurological case, as seems to be almost universally accepted, the good man may profit by it.

The second group is below the borderline are rarely rises into it. Success of a member of this may be attributed to a fluke rather than to ord luck.

The third group is in the borderline area, and wo exasperatingly above and below the pass line. It the despair of the conscientious examiner. A viva of 60 minutes and a clinical examination lasting all would leave the examiner still in doubt, for this is intellectually and permanently on the line. A of good luck may put up a man sufficiently to pas (as one letter-writer states) he is no better than he was ploughed. A man from this group may ce achieve success in after-life exceeding that of m his contemporaries in the first group; but usually t the result of personality and bedside manner than professional ability.

The pertinent question has been asked as to w the significance of the examination. This has been formulated and depends on tradition, for t are no rules limiting or directing the Censors.

The examination essentially demands a high stan both theoretical and practical, in the basic prin of medicine. It may well happen that a candida not asked a single question or given a clinical case he could not equally and fairly have encountered qualifying examination. And yet he may fail. examiner in a final examination often gives a candi a second chance. He will say "Think again, Do you really mean that?" It is most unlikely that will be heard in the membership. In the routine method of examining a patient, and in the recogni and evaluation of obvious physical signs, the candi must be right the first time.

It is here that many a candidate goes astray. Inst of studying over and over again one of the books physical diagnosis, and making certain that in the the methods laid down are conscientiously follo until they become ingrained as an *automatic* rou many assume that their knowledge and practice is a complete up to this stage, and that they are free to to more advanced branches of medicine. And so fail repeatedly at simple cases, not because the exa is pernickety but because they are unaware and re unaware of their own shortcomings. The succe a fellow-student of no greater abilities but who laid his foundations more surely only leaves them than ever convinced that the examination depend luck.

Thus the membership attests that a successful cand has an assured knowledge of the general principl medicine and is intellectually fitted to advance from point by any one of many paths which he may select himself, and it is on this basis that the membership attained its present status.

London, W.1. HENRY TIDY.

HANDLING OF FOOD

SIR,—The deplorable methods of handling food mentioned by Dr. Stanley Turner in his letter of Sept. 11 will be regretted by all. The problem is complicat by the variety of premises and the equipment which is reasonable for them to instal for the special nee of their branch of catering.

I have yet to hear of any great effort to improv licensed premises in this respect. The minimum nee is for the use of twin sinks for washing up, in order permit the use of a detergent and for rinsing. addition, the number of glasses should bear some relatio to the expected peak rush of customers. False economy in the use of water charged by meter is an addition factor.

Elementary methods of food hygiene can only be taught in surroundings which are maintained at suitable standard. We hope to initiate this here in the coming winter by remodelling of municipal caterin premises, using existing materials as far as possible, that when the pier restaurant and the like are le to catering contractors these can be demonstrated to hoteliers and their staffs and provide a standard fo private catering establishments.

Catering staffs vary in their training, but all ar looked down on. As long as a slightly shameful approac ation often only the granules and the nucleus are . In such a cell, although the granules are still within toplasmic boundary the stained appearances suggest hey have lost all contact with the cell. Such a cell n intensely active and may some minutes later be again d up into its classical shape.

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During the first 12 hours after admission the children were very restless in spite of sedation. Thirst was conspicuously absent. Between 12 and 24 hours after admission they were delirious with hallucinations. After 24 hours there was gradual improvement until the 3rd day, when both children appeared perfectly well and happy, though their pupils were still widely dilated. A moderate degree of tachycardia (120–130 per min.) and pyrexia (99–100°F), which had persisted since admission, had by then disappeared.

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Not only are we satisfied with the supply of blood, but we would express the opinion that the serological work of the regional transfusion officer is of a much higher standard than can be expected of all but a very few pathologists.

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Dr. Maycock defends the transfusion centres whose average good service needs no defence, and in arguing the defence, explains some of the shortage by accepting its existence.

It is true that there may be a relative deficiency of the rarer AB and B donors, and an even greater deficiency of AB and B donors who are also Rh-negative; but the rarity of AB and B donors parallels the rarity of the AB and B patients, and therefore an adequate donor service should prevent a deficiency.

It is over the methods required to provide such a service that I disagree with Dr. Piney. The provision of chits to enable donors to purchase extra rations would cease to be effective if and when rationing ends, and would then have to be replaced by a cash equivalent; moreover the reward would have to be disproportionately high in order to tempt a large enough number of people; for, as a race, we seem to react only to critical danger or great personal reward. It is for the same reason that I think good publicity can be only the adjuvant in the remedial mixture.

In my experience a solution may be found with junior house-officers in coöperation with the pathology department. If it becomes the regular practice for the house-man to interview relatives of patients who require transfusion, and explain in simple terms the maintenance of the hospital blood "bank account" and the necessity for special tests on the blood, it will be found that in most cases the relatives are willing to have their names placed on the donor panel to replace the blood when called upon to do so, and that the majority of these do in fact attend when asked. Moreover, after attending once they are usually willing to come again, and blood may thus be replaced in the ratio of 3 : 1 or more. The nucleus of a panel thus formed can be added to by volunteers, hypertensives, and others as opportunity offers.

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The organisation of the collection and testing of blood must, for obvious reasons, be subject to local conditions: wherever possible the facilities of the regional transfusion centres should be used, but until these are sufficient it is possible to organise "local" transfusion services in conjunction with the pathology departments. Their success depends upon the active interest of all the staff, irrespective of seniority, and upon attention to detail in the matters of tact, courtesy, cups of tea, letters of thanks, and so on, all of which give rich dividends on the time invested.

Apathy is fatal, and especially to be avoided is such an apathetic manœuvre as the conferment on a junior resident of the placebo title of "transfusion officer," with duties so nebulous that they cannot be enforced, or the adoption of the complacent attitude that one alone and without the wholehearted aid of his coll can maintain a donor service.

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Obituary

EUGÉNIE LEESON WILLIS

M.A., M.B. CAMB., F.R.C.S.

ss Willis, who died on Sept. 12, at the age of 38, ved her medical education at Cambridge and at the l Free Hospital. qualifying for the Conjoint diploma 35, and obtaining the Cambridge M.B. two years .

ter serving as a house-surgeon at her own medical ol, and holding other resident appointments in the h of England, she took the English F.R.C.S. in 1939, and shortly afterwards came to the North as resident surgical officer at the Oldham Royal Infirmary. From 1942 she specialised in orthopædic surgery, and during her short career she did valuable work, mainly at the Manchester Royal Infirmary. As chief assistant to the orthopædic department there from 1942 to 1945, when the staff was severely depleted by the calls of the Services, she had to bear a heavy burden in the routine care of hundreds of battle casualties. When the fighting ceased she was able to turn her attention to a wider sphere of work as visiting orthopædic surgeon to the nicipal hospitals of the county borough of Oldham, as orthopædic registrar to the Manchester Babies pital. She also served the Manchester University as acher in the departments of anatomy and orthopædic gery.

Jerome, Manchester

ut what promised to be a busy and active career gravely threatened in its earliest days by the elopment of the chronic disease from which she died. courage in facing her disability, and her determination vork despite her grave affliction, earned the admiration l respect of her many friends, to whom her memory l always be vivid.

D. LL. G.

Births, Marriages, and Deaths

BIRTHS

RKWORTH.—On Sept. 13, in London, the wife of Dr. F. B. S. Parkworth—a son.

NT.—On Sept. 15, in London, the wife of Dr. W. E. Hunt —a son.

AVONS.—On Sept. 14, to Dr. Mary Patricia Jeavons (née Woodhouse), wife of Flight-Lieutenant P. M. Jeavons, M.B.—a son.

ARCE.—On Sept. 15, in London, the wife of Dr. Richard Pearce —a daughter.

NDERSON.—On Sept. 16, in London, Dr. Elizabeth Flett, wife of Mr. William Edward Saunderson—a daughter.

ITNEY.—On Sept. 9, at Broseley, Shropshire, to Dr. Freda Whitney (née Bannister), wife of Dr. Rupert Whitney—a son.

MARRIAGES

ES—MORRIS.—On Sept. 16, at Llansannan, Henry Russell Jones, M.R.C.S., to Joan Denman Morris.

DEATHS

NIEL.—On Sept. 18, at Petersham, Surrey, Alfred Wilson Daniel, M.D. Camb

NRY.—On Sept. 17, John Rea Henry, M.B. Belf., aged 64.

GE.—On Sept. 15, at Woburn Sands, Henry Alexander Hinge, C.B., C.M.G D.S.O., M.R.C.S., major-general, R.A.M.C. retd, aged 79.

ME.—On Sept. 12, in London, Irving Somerset Slome, M.B. Lond., F.S. Cape Town.

WART.—On Sept. 16, at Sleights, Yorks, William Stewart, M.B. Edin.

Notes and News

NATIONAL HEALTH SERVICE

MR. BEVAN REVIEWS THE SITUATION

SPEAKING at the annual dinner of the Society of Medical Officers of Health, held in London on Sept. 16, Mr. ANEURIN BEVAN, Minister of Health, said that controversy over the National Health Service Act had been inevitable, but he now looked forward to a period of fruitful collaboration in one of the greatest enterprises ever undertaken by an administration in peace-time. The transition had so far gone with unexpected smoothness, thanks largely to the efficiency of the Civil Service. The object was to secure coöperation, for the benefit of the public and the advancement of medical science, between the State financial machine and the voluntary workers who (though foreigners could not believe it) administered the service. The national genius was to get hold of a principle of this sort "and warm it up by the enterprise of ordinary men and women." No doubt many defects would be revealed and call for improvising ability. He had been much afraid that the middle and professional classes (for whom illness was often especially harassing) might be persuaded to stay outside the service, by people who told them that it was for the needy. But the danger of "a schizophrenic service" had almost passed. The last figures showed that 92–93% of the population had already signed up, and new signatures were coming in at the rate of 150,000 a week. It looked as though nearly everybody would be included by the end of the year, and he was delighted at this because it meant that the N.H.S. would be a classless service. It had been fully expected that during the first year there would be a rush for many of the facilities provided. The natural desire to get something for nothing would wear off; but the new demand was also largely due to real needs which people previously could not afford to meet: it was surprising, for example, to find how many old-age pensioners had been buying their spectacles at Woolworth's. Dentists were now coming into the service more quickly, and no doubt as time went on most of them would be in the scheme.

Many had feared (*Mr. Bevan continued*) *that the Act would* produce a split between different parts of the service: and on the surface it had looked as though they were justified. But he had always believed that the medical officer of health would join up what would otherwise be disjointed: and in fact M.O.H.s had done magnificent work of this kind in the past year. He was very keen on health centres, and was anxious that some should be built quickly. "But we're trying to do an awful lot of things at once." If he had to choose between the preventive effects of a good new house and the curative effects of a new health centre he would choose the house: enough new houses would diminish the need for health centres. Important though the therapeutic contribution to health was, the silent contribution of preventive medicine was far greater —made through such things as a pure piped water-supply, building regulations, sanitary inspection, and the Acts governing food and drugs. He hoped that the M.O.H. would continue to serve as a unifying principle in the health service.

Dr. FREDERICK HALL, president of the society, was glad to think of the M.O.H. as a bridge between preventive and curative medicine: but some bridges were temporary, some were swept away, and some were preserved merely as ancient monuments. He hoped this particular one would be given strong support and firm foundations, part of the support being financial. The Act would be very difficult to operate unless all possible *means were used to limit the incidence of disease*—which was not being done at present. In replying to Dr. J. GREENWOOD WILSON's toast of The Guests, Dr. GUY DAIN, chairman of the council of the British Medical Association, said that the terms of service for different branches of the profession must be so integrated that no branch offered outstanding financial attractions. The association and (he was sure) all doctors would do their best to see that the service was a success, though they would point out defects as these occurred. The Minister had solidified the profession in a way never thought possible and he should make good use of its unity. The best results would come from the service if its members were well organised and well able to express their views. Sir WYNNE CEMLYN-JONES also responded.

It was impossible to be certain how many berries had been eaten, but the elder child stated that both she and her sister had taken one berry each. A plant taken from the place where the children had been playing was found to be *Atropa belladonna* (deadly nightshade).

Typhoid Fever on Clydeside

In the outbreak of typhoid fever in the Greenock, Port Glasgow, and Gourock areas of Clydeside, referred to *on p. 471 last* week, further investigation in Kilcreggan among people living beside the stream has revealed the presence of a carrier. This person, aged 80, had had typhoid fever at the age of 27 and had remained well since then. More accurate typing of the organism isolated from the numerous cases and from the carrier has shown that the type (F2) is an unusual one. One more case has occurred in Gourock associated with this stream; this is in a girl of 6 years who appears to have been ill at home for some time before the family doctor was called. One or two cases in this household are also under observation, and from the dates of sickening these are more likely to have arisen from the girl than from primary infection at the stream, though they too had taken part in picnics and had drunk water from the stream.

Parliament

A Short Session

A SPECIAL session of Parliament was opened by the King on Sept. 14 to pass for the second time through the House of Commons, before it goes once more to the House of Lords, the Parliament Bill which proposes to limit the power of the Lords to hold up legislation to a period of one year. As this measure is the only legislative business of the session the King's Speech was unusually short—74 words—but occasion was taken in the House of Commons in the debate on the Address to discuss matters of national and international interest.

Defence Measures

Mr. HERBERT MORRISON, Lord President of the Council, in his speech, for instance, made an important announcement on defence. All National Service men, he stated, due for release in the next few months who had not left their units by Sept. 14 must be retained for three months beyond the date on which they would normally have been released. In this way alone could the loss of trained men be halted. Releases in class B and on compassionate grounds would not be affected. This change would increase the strength of the Armed Forces by about 80,000. Mr. Morrison emphasised that the increase was in trained men who constituted the real need.

Mr. Morrison also assured the House that considerable progress had already been made with plans for assisting the population, for the reorganisation of the civil-defence services, and for the preparation of any legislation that might be necessary. While the measures which the Government were taking would have some effect upon our economy, it was hoped they would not jeopardise our recovery.

The Farm and the Factory

In the House of Lords on Sept. 16 Earl DE LA WARR moved:

> That this House is of opinion that plentiful food imports are not likely to be available in the foreseeable future, and that it is desirable that the emphasis of our Empire and national economic policy and the allocation of capital resources and man-power should be adjusted to meet this change in our circumstances.

So long as economists advised governments, he continued, that in the reasonably near future there was still a possibility of our being able to return to the good old days of dear exports in exchange for cheap imports of food and raw materials it was unlikely that any government would tackle the problem of making the most of our own soil and our own Empire. The Emergency Food Council's estimate that world production of grain would equal pre-war supplies assumed good harvests, 60% now came from America and Canada, Lord Warr pointed out, we were therefore dependent on weather in that hemisphere. Again, before th 6 million tons of fats and oils were available for this year it was hoped to reach 4 million tons. exports in 1948 were expected to be 40% above t 1947, but, even so, they would be only 40% of the war figure. The Emergency Food Council's figures showed a reduction of 10–15% in the production o

Lord De La Warr was further disquieted to great food producing countries increasing indu at the expense of agriculture. Their populations increasing, and they were tending to keep more themselves, and also making it more difficult for sell our exports. Where were our economists when they warned us against the danger of a too many of our resources to the development of own soil? He recognised that to implement his would mean refocusing our national economic o but it was, he held, a national approach to a problem fundamental to our very existence.

The Earl of HUNTINGDON, joint parliamentary tary to the Ministry of Agriculture, did not doubt danger of the situation, but he urged their Lord take a balanced view. We were not likely to anything like all the food we needed in these the problem therefore arose as to how we were to our food imports. If we were going to have so smoke and a reasonable cut from the Sunday could only get them by our own efforts and He could see no good reason why this nation produce an abundance of the services and other needed to pay for our imports. A more difficult was whether other countries could pay for our in sufficient volume to enable us to buy in Population was undoubtedly increasing, but added, was the scope for improvement of production. The Government recognised that the main and first essential and from the start devoted much of their energies to encouraging production in this country, in the Common Colonies and elsewhere overseas.

Viscount BRUCE of MELBOURNE thought that fo years we must act on the basis of sheer necessity quite apart from any question of balance of pa external payments or anything else. Britain would to achieve and remain on a much higher level of tural production than formerly.

Lord BEVERIDGE suggested that making the a bad job had become one of our major industr that the debate fell within the scope of that He believed that the long-term trend which thro the 19th century had made our position better and through our exchanging industrial products had reversed and would continue to be reversed. But we recognise the price of turning this country over man more to agriculture from industry. There was a sl of man-power, and if we had to grow a great deal of ourselves we should have fewer houses and other th we need. We must therefore take care not to dev agriculture unless it meant that we could get our food home production more cheaply in terms of labour t we could get it by exchange from abroad. Agric must prevail on its own merits, because we needed it, not by protection. He agreed, however, that we bound to make agriculture both more productive man and more attractive of men in relation to indu than it was at present. He also stressed that should be made to realise that our relatively prosperity had gone for ever.

Ending the debate Viscount ADDISON, Lord Pr Seal, said that according to our present progra which seemed likely to be attainable, we aimed at tonnage of bread grains of 2,750,000 tons, and a po yield of 7,250,000 tons. It was obvious, he said, more food must be produced in the sterling ar long-term contracts, leading it was hoped to incr production, had already been made with colonial c tries for wheat and flour, dairy products, meat and b eggs, vegetable oils, sugar, dried fruits, and coffee.

It was true that there was a world scarcity, th there might be here and there a successful harvest.

PENICILLIN IN DIPHTHERIA

RT OF A SUBCOMMITTEE OF THE PUBLIC HEALTH LABORATORY SERVICE*

is investigation the penicillin-sensitivity of 284 of *C. diphtheriæ* isolated in different parts of the was measured. An attempt was also made to t if penicillin treatment shortened the time of of *C. diphtheriæ* in acute cases of faucial diph- nd eliminated the organism in persistent throat . Information on the clinical effect of penicillin s of diphtheria was not sought. Though there is agreement that *C. diphtheriæ* is sensitive to in in laboratory tests, the evidence for this view rests on separate reports on a few strains (Long This criticism also applies to much of the work penicillin treatment of acute cases and chronic , though Karelitz et al. (1947) have treated te cases of diphtheria with encouraging results. e of the low incidence of diphtheria in this we tried to secure sufficient material for nation by carrying out our tests in eight tory areas.†

I—PENICILLIN-SENSITIVITY TESTS CARRIED OUT IN EN LABORATORIES ON 284 STRAINS OF *C. diphtheriæ*

ostatic el er ml.)	All strains	Gravis	Inter- medius	Mitis
)	2	2	—	—
5	32	14	6	12
3	65	34	15	16
2	125	40	27	58
1	38	4	12	22
·06	14	1	2	11
·03	8	—	—	8
ls ..	284	95	62	127

SENSITIVITY OF STRAINS TO PENICILLIN

hnique.—A standarised and stabilised penicillin on was distributed every fortnight by Dr. Joseph r, of Glaxo Laboratories Ltd., and this was used ll tests. The requisite amount of penicillin was l in bulk to nutrient broth (pH 7·5) which contained Lab Lemco,' 1% proteose peptone, 0·5% sodium ide, and 5% of a single batch of heat-inactivated -filtered horse serum : 5 ml. of this broth was used ach dilution of penicillin, which ranged from 0·6 ·03 unit per ml. of medium. For each strain of *iphtheriæ*, therefore, six tubes containing penicillin inoculated together with a broth tube without cillin. In addition a similar control series of tubes ulated with the Oxford staphylococcus accompanied strain under test, and when a batch of strains was d it was customary to put up controls inoculated stock strains of the three types of *C. diphtheriæ*.

ch tube was inoculated with an arbitrary standard ful ('Nichrome'-wire loop of internal diameter n.) of an overnight culture of the organism grown e broth medium. Tubes were then incubated at for twenty-four hours. After thorough shaking the s were examined and the turbidity was recorded. the tube at the visual end-point and from the containing the next highest concentration of illin a standard loopful was then spread on half a blood-agar plate. The number of colonies developing after overnight incubation was estimated and compared with the number obtained from a control tube. This control, with which it was intended to estimate the size of the original inoculum, was prepared by adding a standard loopful of an overnight broth-culture of the strain under test to 5 ml. of the broth medium, and plating out immediately. Subcultures from tubes yielding numbers of colonies greater than half the number from the control were, for the purposes of the test, considered not to show inhibition ; the first tube from which subculture gave less than half the number of colonies from the control tube indicated the penicillin sensitivity of the strain.

Results.—Most of the strains were tested in each of two laboratories, and only very occasionally was there more than a one-tube difference in the sensitivities recorded. Such differences were observed with twelve strains, and these were retested before they were recorded. Under the conditions of our tests the Oxford staphylococcus was inhibited by 0·1 unit of penicillin per ml. of medium. This relatively high reading may be associated with the size of the inoculum used in our tests ; with 1/500 of this inoculum the reading was 0·05 unit per ml. In two small batches of strains of *C. diphtheriæ* tested in two different laboratories where the bacteriostatic levels for the strains of *C. diphtheriæ* were above the average the Oxford staphylococcus was inhibited by 0·2 unit of penicillin, but the ratio was normal. Though it is necessary to mention these few discrepant results, the findings in the different laboratories were remarkably uniform. The results (tables I and II) show that gravis strains of *C. diphtheriæ* are rather more resistant to penicillin than intermedius, and that intermedius are more resistant than mitis strains. It is also clear that most of the strains tested required two or three times as much penicillin for in-vitro inhibition as did the standard strain of staphylococcus.

TREATMENT OF ACUTE CASES

All patients with acute diphtheria received antitoxin in doses depending on the severity of the case. A single batch of crystalline penicillin (sodium salt) was used to treat most of the cases. The standard adult dose was 60,000 units given intramuscularly four-hourly during the day-time only (daily dosage 240,000 units). Children aged 0–4 years received a third, and children aged 5–10 years two-thirds, of the adult dose. Children over 10 years were treated as adults.

A bacteriological check was kept on acute cases by swabbing the nose and throat every other day during

TABLE II—PENICILLIN-SENSITIVITY OF 284 STRAINS OF *C. diphtheriæ* EXPRESSED AS A RATIO* OF THE SENSITIVITY OF THE OXFORD STAPHYLOCOCCUS

Ratio	All strains	Gravis	Inter- medius	Mitis
10	2	2	—	—
6	22	12	3	7
3	75	36	18	21
2	125	40	27	58
1	38	4	12	22
0·6	14	1	2	11
0 3	8	—	—	8
Totals ..	284	95	62	127
Arithmetic mean	2·33	2·85	2·25	1·99
Geometric mean ..	—	0 270	0 206	0·165

* Ratio was obtained by the quotient :

$$\frac{\text{Units of penicillin per ml. of broth bacteriostatic for } C.\ diphtheriæ}{\text{Units of penicillin per ml. of broth bacteriostatic for Oxford staphylococcus}}$$

ROBERT CRUICKSHANK
E. H. GILLESPIE
WILLIAM GOLDIE
H. J. HARRIS
W. H. H. JEBB
Dr. G. J. G. KING
Dr. P. H. MARTIN
Dr. M. T. PARKER
Dr. ALEXANDER MACDONALD (secretary).

iff, Carmarthen, Ipswich, Leicester, London, Northallerton, orwich, and Oxford.

SELECTION OF NURSES FOR A MENTAL HOSPITAL

THE Cassel Hospital for Functional Nervous Disorders has a respectable tradition in the training of psychiatric nurses, and indeed offers a hospital certificate in psychological nursing. As the annual report for 1946 points out, the nursing of patients with neurosis makes considerable demands on the emotional maturity of the nurse; and in the last few years nurses joining the staff have been chosen by a selection procedure which endeavours to assess this quality.

The system was introduced by Dr. C. H. Rogerson (who was later succeeded as medical director by Dr. T. F. Main). He and his medical and nursing colleagues agreed that the personalities of suitable candidates would differ widely and that the one question to be answered was "how is she likely to perform in this hospital?" In the attempt to answer it each candidate is asked to attend for a whole day—from 9.30 A.M. till tea-time—as one of a group of eight.

Facts about her age, schooling, training, and experience are collected on the application form, as well as details relating to psychosomatic symptoms and general health. When she arrives she is received by the matron and a sister in the staff common-room, and is introduced to her fellow candidates over a cup of tea. Toward 10 o'clock the matron tells the group something of the hospital and its purpose, and the sister then takes them on a tour of the premises, introducing them to any members of the staff they meet, and answering their questions. At 10.45 A.M. they return to the common-room and meet the rest of the staff over morning coffee. At 11 A.M. they go to another room, and sitting in a friendly semi-circle round the sister begin their written tests. These aim at giving the candidates opportunities "to respond, in their own characteristic ways, to the same evocative emotional stimuli," and thus to reveal something of their own emotional patterns. Candidates are therefore asked to give an account of the scene portrayed in a picture (Murray's cards are used), and to write a series of sentences each containing a stimulus word (15 seconds being allowed for the composition of each sentence). Each nurse is invited to write a short description of herself as a person; to describe in two minutes the most exciting moment of her life; and to do an intelligence test of the kind which shows capacity to learn.

This carries the group to lunch-time, when they lunch in the cafeteria with staff and patients. At 2 o'clock interviews begin. Two psychiatrists are available, each interviewing four candidates, the interviews lasting 10–40 minutes; meanwhile the matron sees each candidate, as soon as she is free, for a quarter of an hour. The sister conducts them to and from the interviews and gossips with them between whiles.

At the end of the interviews the psychiatrist has in his hands much relevant material about each candidate: the details on the application form, the intelligence quotient, the summary of "personality pointers," and the material he has elicited in talk. The atmosphere throughout the test is made so easy and informal, and the candidate's self-respect is so carefully regarded, that she is usually ready at the interview to tell more about herself, and even in some cases to discuss "stress points" within herself. The matron decides whether she likes her or not—an important decision, since she must work with her.

At 3.30 the whole group meet again with one of the psychiatrists, who initiates a group discussion; here each candidate is seen, so to speak, in social action, and shows her capacity to form easy reciprocal relations with others. At 4.30 the candidates take tea with the matron and are given the opportunity to talk over and criticise the selection procedure; this enables them to leave the hospital on a note of professional respect and equality. The selection team—psychiatrists, matron, and sister—then discuss them, and the matron, aided by the selectors, makes her final choices. The results have shown the value of the tests, and the method has proved acceptable to nurses, whether engaged or not.

Committee on Social Workers in Mental Health

The Minister of Health has set up a committee "to consider and make recommendations upon questions arising in regard to the supply and demand, training and qualifications of social workers in the mental health service. The committee is to present an interim report on these questions in relation to psychiatric social workers." The members are:

Prof. J. M. Mackintosh (chairman); Dr. J. B. S. Lewis, Dr. R. M. Bates, Dr. R. H. Parry, Mr. Bryn Roberts, Dr. Kenneth Soddy, Miss S. Clement Brown, Miss Eileen L. Younghusband, Miss C. V. Barclay, Miss J. M. Mackenzie. Mr. A. Forbes of the Ministry of Health will act as secretary.

Charing Cross Hospital

Field-Marshal Viscount Montgomery will deliver inaugural address to the medical school on Thursday, at 4 P.M.

Welsh National School of Medicine

On Tuesday, Oct. 5, Prof. E. D. Adrian, O.M., F.R.S., deliver the opening address of the session at the 10, The Parade, Cardiff. He is to speak on the Medicine.

Society of Apothecaries

There has been an alteration in the programme course on modern therapeutics announced in our columns last week. Dr. Basil Parsons-Smith will now lecture on Oct. 25. He will speak on Hypertension.

Royal College of Obstetricians and

Dr. Emil Novak, associate in gynæcology in the Hopkins Medical School, Baltimore, will deliver the Anglo-American lecture on Friday, Oct. 1, at 2.15 P. 1, Wimpole Street, London, W.1 (and not at the co viously announced). He is to speak on Certain Fun Tumours of the Ovary.

Royal Society of Medicine

Dr. Philip S. Hench, of the Mayo Clinic, will give the Hyde lecture before the section of physical medicine society on Wednesday, Oct. 13, at 4.30 P.M. The ti lecture is A Critical Evaluation of Current R Rheumatoid Arthritis. The officers of the section those who are not fellows of the society, but who wish to apply for tickets to Dr. Doris Baker, the hon. of the section, at 1, Wimpole Street, London, W.1.

Institute for the Scientific Treatment of Del

Dr. J. D. W. Pearce is giving a course of 12 lectures Psychology of Delinquency, on Thursdays, at 6.30 P.M., ning on Sept. 30. Mr. Hermann Mannheim, DR. JUR Dr. Edward Glover will also give six lectures on and the Psychopathology of Crime, at 6.30 P.M. on T during November and January. Particulars of these other lectures to be given at the institute may be had secretary, 8 Bourdon Street, Davies Street, London, W.1.

Commonwealth Travelling Professorship

The Royal College of Physicians has nominated Dr. G. Pickering, professor of medicine in the University of at St. Mary's Hospital, as Commonwealth travelling for 1949. He will visit Australia and New Zealand in part of that year.

Mr. Arthur Sims, of New Zealand, endowed a Co travelling professorship, under the ægis of the Royal Surgeons of England, the Royal College of Physicians of the Royal Australasian College of Physicians, and the Australasian College of Surgeons, providing for the ment annually of a travelling professor to visit Australia, New Zealand, South Africa, and Canada to assist advancement of medical science either by lecturing, investigating, or engaging in research.

Sir Weldon Dalrymple-Champneys, F.R.C.P., will take as chairman of the council of the Royal Sanitary on Oct. 1.

ÇORRIGENDUM.—*Meningo-encephalitis in Man Due* *Louping-ill Virus.* On p. 454 the last line of the first c should read: ". . . total of 500,000 units. . . ." In the line of the second column, for Dec. 2 read Oct. 2.

Diary of the Week

SEPT. 26 TO OCT. 2

Tuesday, 28th

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mr Bloomfield: The Eugenics of the Utopians—the of the Eugenists.

Wednesday, 29th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn W.C.1
10 A.M. Mr. A. C. Deverell: Relationship of Dental Dis Diseases of the Throat, Nose, and Ear.

Friday, 1st

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
2.15 P.M. (1, Wimpole Street, W.1.) Dr. Emil Novak more): Certain Functioning Tumours of the (Anglo-American lecture.)

UNIVERSITY OF GLASGOW
3 P.M. (Chemistry building.) Prof. Geoffrey Jefferson, Contribution of Sir William Macewen to Neuro and its Sequels. (Macewen lecture.)

PENICILLIN IN DIPHTHERIA

›RT OF A SUBCOMMITTEE OF THE PUBLIC HEALTH LABORATORY SERVICE*

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hnique.—A standarised and stabilised penicillin on was distributed every fortnight by Dr. Joseph r, of Glaxo Laboratories Ltd., and this was used ll tests. The requisite amount of penicillin was d in bulk to nutrient broth (pH 7·5) which contained 'Lab Lemco,' 1% proteose peptone, 0·5% sodium ide, and 5% of a single batch of heat-inactivated -filtered horse serum ; 5 ml. of this broth was used ach dilution of penicillin, which ranged from 0·6 ·03 unit per ml. of medium. For each strain of *iphtheriæ*, therefore, six tubes containing penicillin inoculated together with a broth tube without cillin. In addition a similar control series of tubes ulated with the Oxford staphylococcus accompanied strain under test, and when a batch of strains was d it was customary to put up controls inoculated stock strains of the three types of *C. diphtheriæ*.

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Results.—Most of the strains were tested in each of two laboratories, and only very occasionally was there more than a one-tube difference in the sensitivities recorded. Such differences were observed with twelve strains, and these were retested before they were recorded. Under the conditions of our tests the Oxford staphylococcus was inhibited by 0·1 unit of penicillin per ml. of medium. This relatively high reading may be associated with the size of the inoculum used in our tests ; with 1/500 of this inoculum the reading was 0·05 unit per ml. In two small batches of strains of *C. diphtheriæ* tested in two different laboratories where the bacteriostatic levels for the strains of *C. diphtheriæ* were above the average the Oxford staphylococcus was inhibited by 0·2 unit of penicillin, but the ratio was normal. Though it is necessary to mention these few discrepant results, the findings in the different laboratories were remarkably uniform. The results (tables I and II) show that gravis strains of *C. diphtheriæ* are rather more resistant to penicillin than intermedius, and that intermedius are more resistant than mitis strains. It is also clear that most of the strains tested required two or three times as much penicillin for in-vitro inhibition as did the standard strain of staphylococcus.

TREATMENT OF ACUTE CASES

All patients with acute diphtheria received antitoxin in doses depending on the severity of the case. A single batch of crystalline penicillin (sodium salt) was used to treat most of the cases. The standard adult dose was 60,000 units given intramuscularly four-hourly during the day-time only (daily dosage 240,000 units). Children aged 0–4 years received a third, and children aged 5–10 years two-thirds, of the adult dose. Children over 10 years were treated as adults.

A bacteriological check was kept on acute cases by swabbing the nose and throat every other day during

TABLE II—PENICILLIN-SENSITIVITY OF 284 STRAINS OF *C. diphtheriæ* EXPRESSED AS A RATIO* OF THE SENSITIVITY OF THE OXFORD STAPHYLOCOCCUS

Ratio	All strains	Gravis	Inter- medius	Mitis
10	2	2	—	—
6	22	12	3	7
3	75	35	18	21
2	125	40	27	58
1	38	4	12	22
0·6	14	1	2	11
0·3	8	—	—	8
Totals ..	284	95	62	127
Arithmetic mean	2·33	2·85	2·25	1·99
Geometric mean ..	—	0·270	0·206	0·165

* Ratio was obtained by the quotient :

$$\frac{\text{Units of penicillin per ml. of broth bacteriostatic for } C.\ diphtheriæ}{\text{Units of penicillin per ml. of broth bacteriostatic for Oxford staphylococcus}}$$

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Dr. ALEXANDER MACDONALD (secretary).

ll. Carmarthen, Ipswich, Leicester, London, Northallerton, orwich, and Oxford.

TABLE III—RESULTS OF TREATMENT OF ACUTE CASES OF DIPHTHERIA WITH PENICILLIN

Type of *C. diphtheriæ*	No. of cases treated	Proportion of cases treated "successfully"*		No. in which treatment failed
		Three days	Six days	
Gravis ..	29	7/14	12/15	10
Intermedius ..	17	9/12	3/5	5
Mitis	19	10/11	8/8	1
Totals ..	65	26/37	23/28	16

* "Successful" = no positive swab later than four days from the end of penicillin therapy.

treatment and for a week thereafter. Subsequent swabs were taken at weekly intervals until the patient was discharged from hospital. All swabs were plated on tellurite medium and examined after twenty-four and forty-eight hours in the incubator.

The cases were divided into two groups: one received treatment for three days only, and the other for six days. Treatment with penicillin was considered successful if the patient had the first of a series of consistently negative swabs within four days of the end of the penicillin course. Results are shown in table III and compared in the figure with Wright's (1941) series in Liverpool.

Because of the very few cases available in most of the laboratory areas it was impossible to treat alternate cases with antitoxin alone. At one centre, however, 6 out of 13 cases were "successfully" treated with a three-day course of penicillin, whereas only 3 of 22 control cases treated in the same hospital with antitoxin alone had the first of a series of consistently negative swabs within a fortnight of admission.

TREATMENT OF PERSISTENT CARRIERS

For the purposes of the investigation a persistent carrier was defined as one known to have carried *C. diphtheriæ* in his throat for at least six weeks. Most of the carriers treated were not known to have had acute diphtheria, but a few were considered to be persistent carriers if after six weeks in hospital for acute diphtheria they still harboured the organism in large numbers At first penicillin treatment for throat carriers was given in the same doses as for acute cases. Later the dose of penicillin was increased to 500,000 units twice daily for three days. Throat and nose swabs were bacteriologically examined as for acute cases, and the test of successful treatment was the same. The results are shown in table IV.

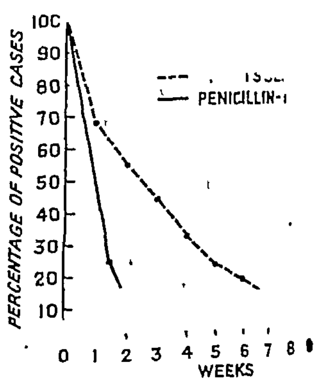
TABLE IV—RESULTS OF PARENTERAL PENICILLIN TREATMENT OF DIPHTHERIA THROAT CARRIERS

Type of *C. diphtheriæ*	No. of cases treated	"Successfully" treated	Failures
Gravis	14	3	11
Intermedius ..	3	2	1
Mitis	14	8	6
Totals ..	31	13	18

Most of the carriers treated with the same doses as acute cases were given a six-day course; but 9 carriers were given 500,000 units of penicillin twice a day for three days, with 3 successes and 6 failures, 5 of the failures being of the gravis type. Sensitivity tests were performed on 5 strains of *C. diphtheriæ* (4 gravis and 1 intermedius) isolated from carriers before and after penicillin treatment. None of the strains isolated after treatment showed an increased resistance to penicillin in the test-tube. Among the 18 carriers in whom treatment failed 7 were known to have diseased tonsils and of these 5 later had their tonsils removed, with subsequent cure of the carrier state. Besides the carriers listed in table IV, 2 nasal carriers were treated succ intramuscular penicillin for three days; 3 further anterior nasal diphtheria were treated three-hourly a local spray of penicillin solution containing a dose of 100,000 units. Treatment was given for days and all 3 cases satisfied the criterion of cur

COMMENT

Though penicillin-sensitivity tests are done in many laboratories, we found it at first difficult, even with a relatively simple culture to achieve a technique which would ensure quantitatively uniform from one laboratory to Preliminary investigation was carried out on such as the size of inoculum, the sample and prep horse serum used, clumping of certain strains of diphtheria bacillus, and the method of reading points. When these difficulties had been most of our strains of *C. diphtheriæ* were finally tested in two laboratories, and the results were very uniform.



Rate of disappearance of C. diphtheria of faucial diphtheria treated with

Most of the strains required two or three times as much penicillin for inhibition as does the Oxford staphylococcus. Only 2 strains were encountered which had a ratio greater than six. From table II analysis has shown that the differences in the mc tivity of each of the three types are all significant is little doubt that the gravis strains are more to penicillin than the mitis type. The scatt sensitivities of the three types, as measured by deviations, shows that *the mitis type differs* si from intermedius and gravis. This greater sca resistance of the mitis type of *C. diphtheriæ* is understandable in view of the greater biological in this group of strains. The results, however, clear *that strains of C. diphtheriæ* of all three tested are sensitive in vitro to concentrations of which can readily be reached in the body.

Because of the limited number of cases and our disposal we could not carry out the type of penicillin treatment which is obviously required rate of elimination of *C. diphtheriæ* from the throat of patients may depend on several variables, as the type or even the strain of *C. diphtheriæ*, the of the patient's tonsils, his age, and whether or not has been *immunised*. We have treated sporadic of diphtheria in different parts of the country, and results may therefore not be strictly comparable those of other workers. Table III shows that 75 65 acute cases treated with penicillin were free of infecting organism within ten days of starting trea and that 26 (70%) of 37 *acute cases treated for three* had become bacteriologically negative within a

In the figure we have compared *Wright's* (1941) L series of cases of acute diphtheria treated with anti alone with our penicillin-treated cases. Only 45 Wright's cases were bacteriologically negative fo days after admission to hospital, compared with of our penicillin-treated cases. Wright's figur differences in the rate of clearance of the three *C. diphtheriæ* from the nose and throat of acute gravis type tending to persist longer than mitis or medius. This suggests that the precise rate of ppearance of *C. diphtheriæ* in any series of cases be influenced by the type composition of that series. mparing our results with those obtained at Liverpool ust also be remembered that the two sets of figures obtained at very different times, and that our e is based on only a fifth of the number of cases ained by Wright. It is also possible that cross- tion may have prolonged the carrier state in some Vright's cases, though his investigation deals with type with which the patient was originally infected. ever, Wright's findings in children are essentially lar to those obtained by Hartley and Martin (1919–20) ldiers and by Thomson et al. (1926–27) in a London r hospital. Wright's curve being taken as an uate basis for comparison, the curve for the rate of ppearance of *C. diphtheriæ* in penicillin-treated cases much more steeply. Our series included a propor- of immunised patients, but there was no evidence immunisation affected the clearance-rate.

right's finding and our own small group of control s support the view that penicillin treatment tens the duration of carriage of *C. diphtheriæ* in e cases, and that our results would not have been ined in cases treated with antitoxin alone. The ll group of cases caused by the mitis type of *liphtheriæ* appeared to respond best to penicillin tment. Apart from any possible clinical benefit h penicillin treatment may confer, the early elimina- of *C. diphtheriæ* is desirable to reduce the risk of s-infection and, in many instances, to shorten the ent's stay in hospital.

enicillin treatment of persistent carriers has not, in doses used, given very encouraging results, but the ber of carriers treated was too small for definite lusions to be drawn. Of 31 carriers treated 13 eared to respond to penicillin, but possibly some of e would have become clear spontaneously during period of test. The higher doses of penicillin ocated by Long (1947) apparently gave in a few of carriers no better results than the smaller doses l earlier. Our records suggest that it may well be er to prevent with penicillin the acute case from oming a convalescent carrier than to cure the estab- ed carrier condition. If this is so, there is every son to begin penicillin therapy as early in the disease possible and not to wait until the diphtheria organism become firmly established in diseased tonsils.

SUMMARY

enicillin-sensitivity tests were carried out on 284 ains of *C. diphtheriæ* isolated in different parts of the ntry. Most of the strains tested were two or three es as resistant to penicillin as the Oxford staphylo- cus. Gravis strains of *C. diphtheriæ* were more istant to penicillin than intermedius, and intermedius re more resistant than mitis types.

Of 65 acute cases of faucial diphtheria treated with nicillin, 26 of 37 receiving a three-day course, and of 28 receiving a six-day course, became free from infecting organism within four days of the end of atment. In 31 persistent diphtheria carriers penicillin atment was followed by the rapid disappearance of organism from the throat in only 13 cases.

Ve wish to thank Dr. Joseph Ungar, of Glaxo Laboratories, supplying the penicillin for sensitivity tests; and nerous medical officers of health and clinicians who ted the cases and carriers.

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THYMINE, FOLIC ACID, AND VITAMIN B_{12} IN NUTRITIONAL MACROCYTIC ANÆMIA, TROPICAL SPRUE, AND PERNICIOUS ANÆMIA *

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WILLIAMS-WATERMAN FELLOW IN NUTRITION

THE rapidity with which the scientific and therapeutic advances on folic acid or pteroylglutamic acid (Spies 1947), thymine or 5-methyl uracil (Spies et al. 1946), and vitamin B_{12} (West 1948, Spies et al. 1948a and b) have been made is unparalleled. Within three years these three compounds have been found to produce blood regeneration in certain types of macrocytic anæmia. Each has offered the prospect of specific therapy with a pure chemical compound. The molecular structures of thymine and of folic acid are known, and much work is being done to elucidate the structure of vitamin B_{12}.

Under the scrutiny of physicians these materials must be appraised in respect to their effect on man. It is well known that the response of patients to liver extract or to folic acid is extremely variable. Some respond maximally to much smaller doses than do others. This extreme variation in the individual response under test conditions made it desirable to observe the effect of folic acid, thymine, and vitamin B_{12} in the same person in the same degree of relapse, under similar conditions, and on the same diet. The present report is limited to a study of the blood response to each of these substances in a patient with nutritional macrocytic anæmia, one with pernicious anæmia, and one with tropical sprue.

Using the diagnostic criteria and laboratory methods previously described (Spies 1947), we selected and studied three patients. Each was admitted to hospital in relapse three times and on each admission was given a different pure chemical substance, while the diet and the conditions of the study were kept constant.

CASE-RECORDS

Case 1.—A white man, aged 51, was admitted to the Jefferson-Hillman Hospital, Birmingham, Alabama, in April, 1946, complaining of extreme weakness. His family history and previous personal history were irrelevant. Three years before admission, while working as a coalminer, he developed shortness of breath, tinnitus, vertigo, "fluttering of the heart," "shimmering of the vision," and frequent bleeding of the gums. These symptoms progressed rapidly, and within two months of their onset the patient was forced to stop working and was admitted to a hospital, where he was treated with liver extract. He soon became asymptomatic and was discharged from the hospital. On returning home he resumed eating the same type of diet he had eaten as long as he could remember. It consisted of grits, bread, syrup, fat, two eggs, and two glasses of milk daily. He rarely ate meat,

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* Northwestern University studies in nutrition at the Hillman Hospital, Birmingham, Alabama, and at the General Calixto Garcia Hospital, Havana, Cuba.

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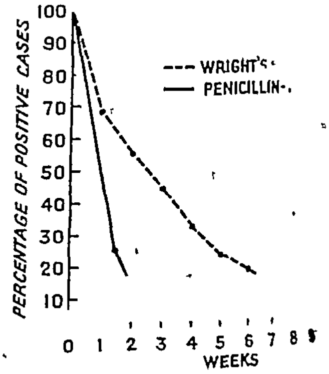

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l. Improvement continued, and he was discharged weeks after admission. Gastro-intestinal radiography nth after therapy showed a continuous barium n.

nd *Admission.*—He remained well until April, 1947, he again began to have diarrhœa and loss of appetite. s visiting in the country at the time and did not come to spital until a month after the onset of these symptoms. s second admission the clinical and laboratory findings similar to those on his previous admission, except he red-cell count was 1,170,000 per c.mm., Hb 5·1 g. 0 ml. (33%), and reticulocytes 2·2%.

was given 10 mg. (10,000 µg.) of synthetic folic acid by daily for fourteen days. The blood response is shown . 3. Clinical improvement began about the time the locytes began to rise on the fourth day of therapy; reness of his tongue was relieved, his appetite returned, e began to get stronger. By the ninth day of therapy wel actions had decreased from 10 to 3 daily, and the were better formed and more normal in colour. By me he was discharged, three weeks after admission, he ained 10 lb. and felt well.

rd *Admission.*—He had no recurrence of symptoms until 1948, when he developed severe bronchitis and lost ppetite. Within a week of the onset he began having rately severe diarrhœa, soreness of the tongue, and stric distress. He was in bed and unable to come to the tal for four weeks after he became ill. When he came and dmitted for the third time his tongue was moderately ned: he was very pale and weak and was having 5 soft or liquid yellowish-brown stools daily. His red- count was 2,500,000 per c.mm., Hb 7·8 g. per 100 ml.), and reticulocytes 1%. The other laboratory findings as on his first admission.

was given a single injection of 23 µg. of vitamin B_{12}. blood response is shown in fig. 3. His appetite oved and he felt well four days after therapy, and eadily gained in strength. Eight days after therapy wel movements decreased to 2 soft fairly well-formed s daily.

ise 3.—A white man, aged 46, was admitted to the man-Jefferson Hospital, in March, 1946, complaining of al weakness, dyspnœa, palpitation on exertion, soreness he mouth and tongue, swelling of the legs and feet, and sthesiæ of the extremities. His family history and previous onal history were irrelevant. A year before his admission oted that he became tired very easily, had difficulty in thing, and had palpitation on exertion. These symptoms ually became more severe. Six months after their onset his tongue, which he had noted to be abnormally red, began burning, especially when he ate "sour or hot" foods. About three months later he began to have numbness of his hands and feet and swelling of his feet and ankles.

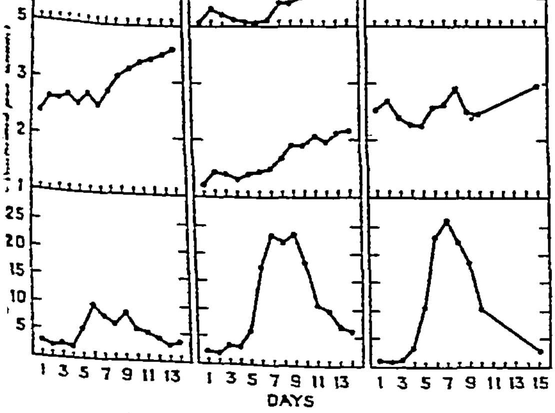

Fig. 3—Blood responses of case 2.

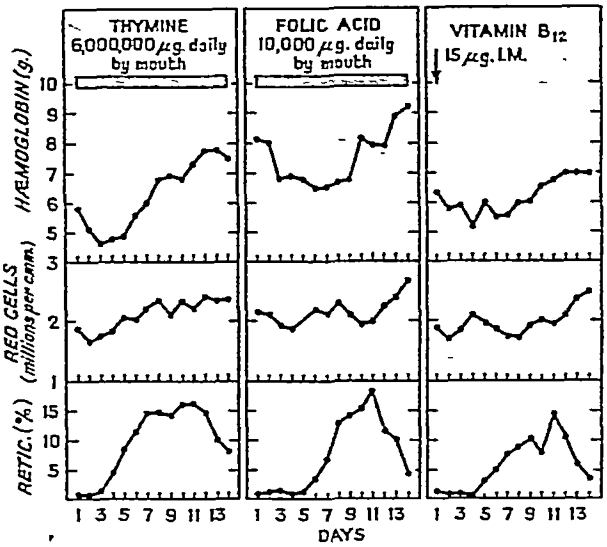

Fig. 4—Blood responses of case 3.

First Admission.—He was pale and looked weak but not acutely ill. The skin, nail beds, and conjunctivæ were very pale. His tongue was smooth and red; the buccal mucosa was red, and the gums were swollen and injected. Neurological examination showed sensory changes suggesting peripheral neuritis.

Gastric analysis showed no free hydrochloric acid after histamine stimulation. Gastro-intestinal radiography was normal. An oral glucose-tolerance test showed a flat curve. The urine was normal. The stools contained no ova, parasites, or occult blood. The red-cell count was 1,860,000 per c.mm., Hb 5·8 g. per 100 ml. (38%), and reticulocytes 0·3%. The sternal bone-marrow showed typical megaloblastic arrest. Pernicious anæmia was diagnosed.

The patient was kept on a diet devoid of meat and meat products. After the base-line determinations had been completed, he was given 6 g. (6,000,000 µg.) of synthetic thymine by mouth daily for fourteen days. The blood response is shown in fig. 4. Though the sternal bone-marrow just after the peak of reticulocytosis revealed a normoblastic reactive stage, his anæmia began to relapse soon after therapy was discontinued. Clinically his improvement was slight; the stomatitis, the glossitis, and the nervous symptoms did not improve.

Second Admission.—In December, 1946, the weakness and dyspnœa recurred, but he did not come to the clinic until May, 1947, when he had become too weak to continue working. On his second admission the physical findings were essentially the same as on his previous admission. His red-cell count was 2,150,000 per c.mm., Hb 8·1 g. per 100 ml. (53%), and reticulocytes 0·6%. The other laboratory findings were as on his first admission.

He was given 10 mg. (10,000 µg.) of synthetic folic acid daily by mouth for ten days. Fig. 4 shows his blood response. As his blood-levels rose he gained strength, and the glossitis and stomatitis improved, though they did not disappear entirely.

Third Admission.—In March, 1948, the patient developed very severe glossitis, stomatitis, and weakness, and was admitted for the third time. His red-cell count was 1,090,000 per c.mm., Hb 6·3 g. per 100 ml. (41%), and reticulocytes 1%.

He was given a single injection of 15 µg. of vitamin B_{12} intramuscularly. His blood response is shown in fig. 4. Definite fading of the hyperæmia of the tongue and the mucosa of his mouth was observed forty-eight hours later. Five days after the injection of vitamin B_{12} the colour of the mucosa was almost normal. Regeneration of the lingual papillæ was apparent by the thirteenth day. A remarkable improvement in his strength and vigour paralleled his blood response.

poultry, cheese, green vegetables, or fruit. Fig. 1 shows that his diet was deficient in many nutrients, particularly nicotinic acid and ascorbic acid. Except for moderate weakness he remained well until April, 1946, when he developed moderately severe diarrhœa and his weakness became severe. At that time he came to the nutrition clinic seeking treatment and was admitted to the hospital.

First Admission.—He was pale and seemed weak but not acutely ill. His skin was very pale and slightly icteric. The skin on the dorsum of the hands was moderately thickened, pigmented, furrowed, and inelastic. On the elbows, across the scapulæ and spine, and round the ankles the skin was thickened and wrinkled. The palpebral conjunctivæ were moderately pale. There was bilateral generalised injection of the ocular conjunctivæ. In each eye, on the nasal side, there was a severely injected pterygium, which extended on to the cornea. The buccal mucosa was pale and œdematous. The nail beds were extremely pale. Neurological examination showed nothing abnormal.

Gastric analysis showed free hydrochloric acid in the gastric contents. Gastro-intestinal radiography was negative. An oral glucose-tolerance test showed a normal curve. The urine was normal. The stools contained no ova, parasites, occult blood, or urobilin. The icteric index was 10·9 units. The red-cell count was 2,220,000 per c.mm., Hb 10·7 g. per 100 ml. (70%), and reticulocytes 2·4%. The sternal bone-marrow showed typical megaloblastic arrest. Nutritional macrocytic anæmia was diagnosed.

The patient was kept on a diet devoid of meat and meat products. After the base-line studies had been completed, he was given 6 g. (6,000,000 µg.) of synthetic thymine daily by mouth for fourteen days. The blood response is shown in fig. 2. The patient's strength gradually returned as his blood-levels rose and his diarrhœa subsided. When he was discharged from hospital three weeks after admission he volunteered that he felt better than he had for many months.

Second Admission.—He remained well until January, 1947, when he began having occasional diarrhœa, with watery stools, soreness of the tongue, bleeding of the gums, and a recurrence of weakness. On his second admission to the hospital his red-cell count was 2,170,000 per c.mm., Hb 8·8 g. per 100 ml. (58%), and reticulocytes 1·4%. The results of gastric analysis, glucose-tolerance test, stool studies, analysis of urine, and sternal bone-marrow study were essentially the same as on his previous admission.

He was given 10 mg. (10,000 µg.) of synthetic folic acid daily by mouth for ten days. The blood response is shown in fig. 2. His diarrhœa stopped six days after the start of therapy. He gained strength rapidly and was discharged two weeks after admission.

Third Admission.—In April, 1948, the patient rather suddenly developed anorexia, general weakness, and slight soreness of the mouth and tongue. These symptoms progressed rapidly for a week, and he came to the nutrition clinic. On his third admission his red-cell count was 2,020,000 per c Hb 6·5 g. per 100 ml. (42%), reticulocytes 3·6 results of gastric analysis, glucose-tolerance test, stool and urine analysis were essentially unchanged. examination revealed nothing remarkable except severe glossitis than had been observed during any pre relapse of his anæmia.

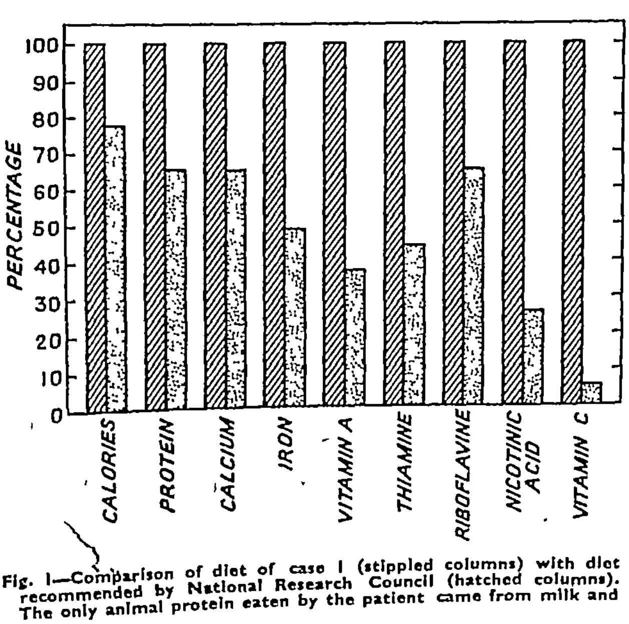

Fig. 1—Comparison of diet of case 1 (stippled columns) with diet recommended by National Research Council (hatched columns). The only animal protein eaten by the patient came from milk and eggs.

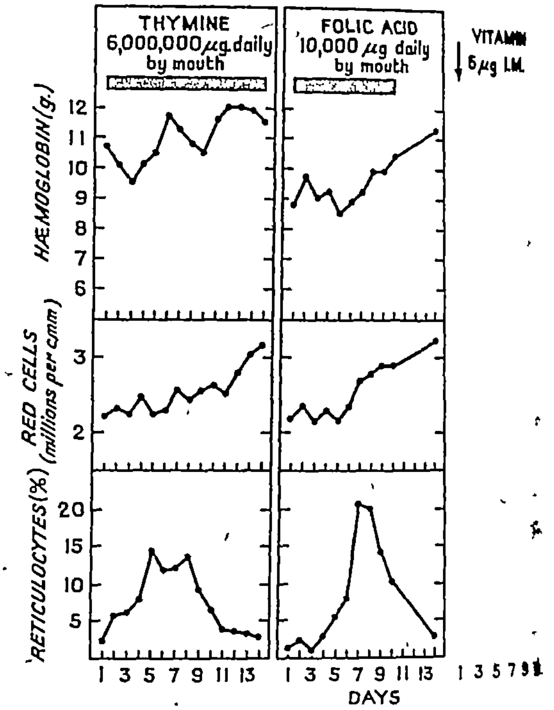

Fig. 2—Blood responses of case I.

The patient was given a single injection of 6 µg of B_{12} intramuscularly. The blood response is shown in The glossitis had disappeared by the fifth day injection, and he quickly and steadily gained strength.

Case 2.—A white Cuban farmer, aged 70, was to the General Calixto Garcia Hospital, Havana, 1946, complaining of loss of appetite, diarrhœa, and His family history and previous personal history irrelevant. Four months before admission he began have diarrhœa, consisting of 6–8 large watery yellow stools daily. Within a week his bowel movements to 11 or 12 daily; his tongue became very sore, began to have severe epigastric distress. He was eat anything but rice, soup, and milk. Ten days after illness began, weakness forced him to stop work; and then until he was admitted to hospital he spent most of time in bed. During the four months he lost 40 lb. in

First Admission.—He was pale and looked very weak ill. His skin was generally pale. His tongue was red slick. The buccal mucosa, conjunctivæ, and nail beds very pale. There were no other abnormal physical fin and neurological examination was negative.

Gastric analysis showed free hydrochloric acid in the contents. The stools were voluminous, liquid, foul- and whitish-yellow; they contained no ova, parasites, blood, or urobilin. On gastro-intestinal radiography barium column was not continuous but broken into isolated areas. An oral glucose-tolerance test show flat curve. The sternal bone-marrow showed typical m blastic arrest. The red-cell count was 2,390,000 per c Hb 9·3 g. per 100 ml. (60%), and reticulocytes 2·8%. Tr sprue was diagnosed.

The patient was kept on a diet devoid of meat and products throughout. After the base-line studies had completed he was given 10 g. (10,000,000 µg.) of synt thymine by mouth daily for fourteen days. The blood resp is shown in fig. 3. Clinical improvement began three after therapy was started; his appetite improved, and said he felt stronger. By the end of the first week he spending most of the day out of bed. The diarrhœa bega subside about this time; the stools became fewer and le s known that, if the infant is provided with a ntly high concentration of Rh-negative cells, sitive cells fall to a low level or disappear completely while, evidently because the stimulus to the pron of new cells has been removed (Mollison 1943). transfusion of Rh-negative cells will thus also a replacement of Rh-positive cells by Rh-negative ut will leave the infant to excrete a far larger r of Rh-positive cells.

CORRECTION OF ANÆMIA

discussing the treatment of hæmolytic disease of ewborn the impression must not be given that ation of tissue damage is the only object of treat-

Some deaths take place within 24 hours of birth, e believe that the mechanism in this group of deaths is different. Those infants who die soon birth are all profoundly anæmic and are usually sed. In a few cases in which we have measured nous pressure we have found it strikingly increased. ms likely that the syndrome displayed by this of cases is similar to the "hyperkinetic phase" bed by Howarth and Sharpey-Schafer (1947) in with chronic severe anæmia. In this group the of treatment must be to raise the hæmoglobin ut overloading the circulation, and this can be rationally accomplished by exchange transfusion. rtheless the prognosis in these cases is very bad, o form of treatment is likely to save many of ; there seems little doubt that they can be regarded rder-line cases of hydrops fœtalis.

ants who survive the first five days of life without ing any signs other than jaundice and perhaps pallor may later develop profound anæmia and one or more transfusions. If exchange transfusion be as simply carried out, and be shown to be as as an ordinary transfusion, it might prove to be nost satisfactory method of treatment for all cases molytic disease other than the mildest.

th the introduction by Diamond (1947) of the ique of carrying out exchange transfusions through stic catheter passed up the umbilical vein after , we felt that the needed simplification in technique been achieved, and since March, 1947, we have given method a fairly extensive trial.

METHODS

ion of Cases

e cases were selected from 63 infants seen by us $^1/_2$ years. All these 63 infants were Rh-positive were born to women whose sera contained Rh-anti-. The 33 infants not treated by exchange transfusion the umbilical vein included 6 born dead or moribund, reated by simple transfusion of Rh-negative blood a peripheral vein, and 14 so mildly affected as to ire no treatment.

Whenever possible, cord blood was examined. Other- a venous sample was taken as soon after birth as ible. The main examinations made were a direct mbs test, hæmoglobin, plasma-bilirubin, degree of hroblastæmia, and amount of free antibody. As the stigation proceeded, it became clear that it was ible to make reliable estimates of severity as a lt of these examinations, and we left untreated any nt whom we considered was mildly affected and kely to need a transfusion subsequently.

he 30 infants selected for exchange transfusion were nfants whose cord blood had either a hæmoglobin w the normal range, or a bilirubin value above the nal range, or both. Further details are given below.

nique

e have described elsewhere the technique of exchange sfusion via the umbilical vein (Mollison, Mourant, Race 1948). This technique is based on that described by Diamond (1947), though it is not known whether it differs from his in minor details.

The essentials of the technique are as follows:

Under aseptic conditions the umbilical cord is completely divided about $^1/_2$ in. from the abdominal wall. A fine transparent plastic catheter is passed up the umbilical vein until blood can be freely withdrawn (usually 2–3 in.), whereupon 20 ml. of blood is withdrawn and immediately replaced by 20 ml. of Rh-negative blood. An arrangement of stopcocks makes it possible to do this without changing the syringe. Thus 20 ml. amounts of blood are exchanged until about 350–450 ml. has been withdrawn and replaced by Rh-negative blood. In some cases an additional 50 ml. of blood is finally injected without any further withdrawal.

The whole procedure takes 1 or 2 hours. No heparin is injected into the infant, but the apparatus is rinsed with dilute heparin-saline solution from time to time.

The exchange transfusions were most often carried out within 13 hours of birth (23 cases). In the remaining 7 cases they were done 17–38 hours after birth. Occasionally in these later cases small clots were found in the umbilical vein, but these did not obstruct the passage of the catheter. In most cases there was no special difficulty in passing the catheter, once practice had been acquired.

We have used umbilical catheterisation for obtaining blood samples or carrying out tests on other infants, so that in all we have used this method in 77 cases. Though in the first few weeks, when we were acquiring experience with this method, we twice failed to pass the catheter we have since only once been unsuccessful. In this series of 77 cases we have not seen any umbilical sepsis, though only about 7 of the infants having exchange transfusions and none of the infants having simple tests were given prophylactic chemotherapy. Nevertheless, until experience has been acquired, we recommend that the infants be given prophylactic doses of penicillin for 48 hours.

In this series we have not seen any ill effects attributable to the procedure. One infant bled from the cord some hours later, but the hæmorrhage seemed to be coming from a small vessel and not from either of the umbilical arteries or the umbilical vein, and it seemed that the hæmorrhage might well have occurred in any event, simply from the unusual vascularity of the cord. Air-embolism has been reported as a danger of this method, but in the case concerned a rubber catheter was used (J. J. Van Loghem, personal communication). With the transparent polyethylene catheter that we have used throughout, minute air-bubbles can easily be seen and their introduction into the infant's circulation readily avoided.

Choice of Donor

At first ordinary stored blood was used, but it soon became clear that it had the disadvantage of being too greatly diluted with citrate. Subsequently, therefore, slightly concentrated suspensions of red cells were prepared by removing some of the supernatant plasma-citrate immediately before use. Whenever possible, donors were bled specially into relatively small volumes of anticoagulant. It was found convenient to use the mixture recommended by Ross et al. (1947)—i.e., disodium citrate 2·5 g., glucose 3 g. made up in 50 ml. of distilled water—and 500 ml. of blood was taken into a bottle containing this mixture. Alternatively the donor was bled into a bottle containing 1–2 ml. (2000 Toronto units) of heparin.

When supernatant plasma-citrate was removed, we were often left with only 400 ml. of donor's blood or even less. However, we found that, provided we had raised the red-cell count of the modified donor's blood to between 5 and 6 million red cells per c.mm., the injection of 300–400 ml. usually achieved at least an 85% exchange of red cells. Provided that the infant showed no sign of circulatory overloading, which we sometimes checked by direct measurement of venous

SUMMARY AND CONCLUSIONS

A comparative study of thymine, folic acid, and vitamin B_{12} has been made under controlled conditions on selected patients with macrocytic anæmia in relapse. One patient with pernicious anæmia, one with nutritional macrocytic anæmia, and one with tropical sprue were each admitted three times to the hospital and given a diet free from meat and meat products. Base-line determinations were made on each admission. Each compound produced a blood response and a definite clinical improvement.

The fact that three distinct chemical compounds have proved effective in each of three distinct syndromes suggests that we may learn a great deal about the pathogenesis of these diseases.

From these and other studies by us it appears that several thousand times the weight of thymine is required to produce a response similar to that produced by folic acid, and that several thousand times the weight of folic acid is required to produce a response similar to that produced by vitamin B_{12}. These findings suggest that vitamin B_{12} is by far the most potent antianæmic substance known.

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The thymine was supplied by Dr. J. A. Aeschlimann, of Hoffmann-LaRoche Inc.; the folic acid by Dr. Benjamin Carey and Dr. Stanton Hardy, of Lederle Laboratories Inc.; and the vitamin B_{12} by Dr. Augustus Gibson, of Merck and Company, Inc.

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EXCHANGE TRANSFUSION IN HÆMOLYTIC DISEASE OF THE NEWBORN

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In 1946 Wallerstein pointed out that the treatment of hæmolytic disease by repeated transfusion of Rh-negative blood did not prevent some infants from dying of "toxæmia," and he suggested that withdrawal of part of the infant's blood, with simultaneous replacement by Rh-negative blood, might be more successful by removing end-products of red-cell breakdown. He found that, if 250 ml. of the infant's blood was withdrawn from the sagittal sinus, and 250 ml. of Rh-negative blood simultaneously transfused into a peripheral vein, about a 65% replacement of blood was achieved.

Wiener and Wexler (1946) introduced the modification of bleeding the infant from the radial artery; they considered mathematically the effect on the composition of the infant's blood of simultaneous bleeding and withdrawal, and plotted a curve showing the percentage exchange after the withdrawal and injection of increasing amounts of blood. They concluded that, if the exchange were continued until an amount equivalent to twice the infant's initial blood volume—i.e., 2 × 250 ml.—had been withdrawn and replaced by Rh-negative blood, 86% of the cells remaining in the infant's circulation should be Rh-negative. Wiener et al. (1948) have since suggested that even more massive replacements should be performed, and state that an exchange of 1000 ml. leads to a replacement of about 98% of the infant's red cells.

MECHANISM OF TISSUE DAMAGE

Discussion of the treatment of hæmolytic the newborn is greatly handicapped by the any real understanding of the mechanism of the to the brain and liver which occurs in some causes all the unpleasant sequelæ and many deaths. Clearly, if this damage were fully at birth, little could be hoped for from su treatment. Vaughan (1946) and Parsons (1947) drawn attention to the fact that infants who damage to the liver and brain tend not to sho pronounced anæmia, and this has led them to that the damage may be due to a direct antibody on the tissues rather than to any indirect of blood destruction. However, the matter controversial, and the following points may above-mentioned observations in a slightly differen

First, though anæmia can be readily d examining cord blood, in which the range of values is fairly narrow, it is far harder to interpret globin estimations made in the few days after It is now accepted that at birth the infant variable amount of blood from the placenta to the time at which the cord is tied, and leads to a variable increase in hæmoglobin values birth (DeMarsh et al. 1942). This widens the range of values and may mask a moderate We have observed that an infant whose cord contains a concentration of hæmoglobin well normal range may receive a sufficient amount of from the placenta to acquire a value, a few hou birth, which lies within normal limits. Thus a hæmoglobin value during the first day or two can certainly not by itself be taken as exclu operation of a hæmolytic process.

Secondly, even the maintenance of a high hæ value for many days after birth does not possibility that a very rapid destruction of being fully compensated by a rapid regenera have observed a case in which an infant wi deep jaundice maintained a hæmoglobin 120% between the 4th and 7th days of life found by cell-survival experiments to be d 50% of transfused Rh-positive cells in two days.

Thirdly, in our experience, infants who are pr anæmic at birth are likely to die within 24 hours; less many are stillborn. Thus there is a tende infants who are severely anæmic at birth not long enough to develop kernicterus.

These three points make it possible that tissue may, after all, prove to be specially associated rapid blood destruction. That anti-Rh has a action on the tissues of a Rh-positive infant doubtful, since we have sometimes observed a amount of free Rh-antibody persisting in the of an affected infant for many weeks after treat a simple transfusion, without the development of signs of damage to the liver or the brain.

It remains doubtful whether the tissue sometimes associated with hæmolytic disease is esta at birth, and we believe there is some evidence it may, at least sometimes, mainly occur after It is possible that the poor excretory capacity of liver in the first few days of life is concerned, and of some interest that deaths from the "toxic st of hæmolytic disease take place at 2–4 days, just physiological hyperbilirubinæmia in the normal infant is at its highest. At all events there is su doubt about the cause of deaths at 2–4 days to it worth while to try the effect of removing as as possible of the Rh-positive cells very soon after and replacing them by Rh-negative cells by exch transfusion.

f Exchange

he accompanying figure are plotted estimates of umbers of Rh-positive and of Rh-negative cells in culation of an initially anæmic infant in samples at intervals during an exchange transfusion. The s blood had been artificially concentrated so that unt was 5,900,000 red cells per c.mm. The con- tion of the infant's own (Rh-positive) erythrocytes om 1,650,000 per c.mm. to 560,000 per c.mm., as the count of Rh-negative cells rose rapidly to a concentration of 4,500,000 per c.mm. At the f the exchange transfusion a further 40 ml. of gative blood was injected into the infant without rawing any more blood, and this raised the con- ation of Rh-negative cells to 4,900,000 per c.mm. far we have emphasised the exchange of red cells ave not mentioned the exchange of plasma con- nts, because we have been led to conclude that emoval of plasma constituents from the infant's ation is unlikely to play any considerable part in tcome. We have found that the amount of free tibody removed by exchange transfusion is less would be expected if the infant's total amount ibody were present in the plasma at the beginning transfusion. It seems that, as with other plasma- ns, there is an equilibrium between the tissues and lasma, and that removal of antibody from the a leads to the entry into the plasma from the s of a further amount so that a new equilibrium ched at a slightly lower level. The lowering of a-bilirubin by exchange transfusion is even less, ere there is evidently the possibility of further ction of bilirubin during the transfusion.

DISCUSSION

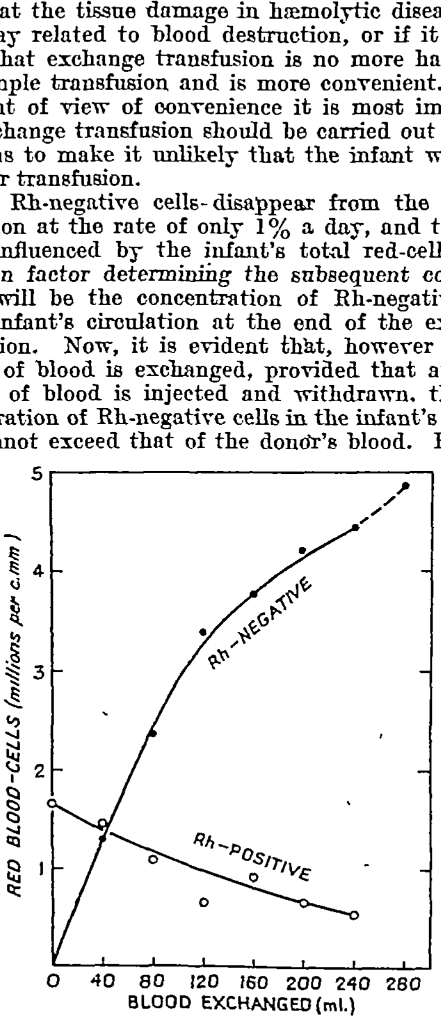
must make it clear that we do not intend, on the of only 30 cases treated by this method, to try to nstrate any effects on the morbidity and mortality molytic disease of the newborn. Cases of hæmo- disease vary from being so severe as to kill the in utero at about the 24th week to being so mild t to require any treatment. Moreover the severity nds on factors which cannot be assumed to operate e same extent in different series. For example, is the effect of a transfusion of Rh-positive blood to a Rh-negative woman on the severity of lytic disease in her subsequent offspring, which is shown by our present series. Among our cases we d 48 affected infants born to mothers who had iously only given birth to healthy children; 16 of mothers had, however, previously been transfused blood of unknown Rh type, and 8 of their ts died. Among the remaining 32 infants born nothers who had never been transfused there were 2 deaths. The difference between these figures is ly significant. This finding is in agreement with earlier observations of Diamond (1945) and Levine Waller (1946).

ow, it is clear that, if one is seeing cases of hæmolytic se in a district where, during the preceding few s, Rh typing has not been carried out before giving sfusions to women, one is likely to see more severe than if one practises in an area where few trans- ns are given or where Rh tests have been made many years. It is easy to think of other ways in h selection can lead to different kinds of cases seen by different observers. For instance, in an tric unit one certainly sees more mild cases and ably more very severe cases than in a pædiatric ; doubtless there are differences between places e families are large and those where families are l, for birth rank has some effect on severity. Also reputation of a unit for treatment might foster the fer of ca [illegible] an average severity to it.

There is little doubt that, if two observers were eacl to collect cases in different parts of the country anc to apply no treatment of any kind, a significant differenc in mortality between the two series might be found Moreover, it cannot even be assumed that the sam observer sees a similar selection of cases in two successiv years.

Apart from the above-mentioned factors one mus consider the effect of better methods of diagnosis, witl a resulting tendency to diagnose more mild cases. Thu at first sight it seems likely that the only way in whicl the value of exchange transfusion could be provec decisively would be by applying it to alternate case in competition with, for example, simple transfusion It might be possible to collect homogeneous group —e.g., infants born to mothers previously transfusec with Rh-positive blood, or, better still, infants with comparable changes in cord blood—and to treat alternat cases differently. Certainly it seems impossible t draw any conclusions from two different series unles one can be sure that the selection of the cases has beer closely similar. It may not be necessary to attemp statistical proof if further evidence can be collected t show that the tissue damage in hæmolytic disease is i some way related to blood destruction, or if it can b shown that exchange transfusion is no more hazardou than simple transfusion and is more convenient. Fron the point of view of convenience it is most importan that exchange transfusion should be carried out in sucl a way as to make it unlikely that the infant will neec a further transfusion.

Since Rh-negative cells disappear from the infant's circulation at the rate of only 1% a day, and this rate is not influenced by the infant's total red-cell count, *the main factor determining the subsequent course of* events will be the concentration of Rh-negative cells in the infant's circulation at the end of the exchange transfusion. Now, it is evident that, however large a volume of blood is exchanged, provided that an equal amount of blood is injected and withdrawn, the final concentration of Rh-negative cells in the infant's circulation cannot exceed that of the donor's blood. Further,



Estimates of concentrations of Rh-negative and Rh-positive cells in samples taken from an infant during the course of an exchange transfusion: initial red-cell count of infant 1,650,000 per c.mm.; final count of Rh-positive cells 560,000 per c.mm.; red-cell count of donor's (Rh-negative) blood 5,900,000 per c.mm.; count of Rh-negative cells in infant's circulation after exchange of 240 ml. 4,480,000 per c.mm. Thus, after the exchange of an amount of blood about equal to the infant's blood volume, an 88% exchange was effected in this case. Finally (broken line), 40 ml. of Rh-negative blood was injected without further withdrawal to secure a final count of 4,910,000 Rh-negative cells per c.mm.

pressure through the umbilical catheter, we made a practice of injecting about 50 ml. more than we withdrew.

Subsequent Investigations.—In most cases the percentage exchange at the end of transfusion was estimated by differential agglutination. In 2 cases the rate of exchange also was determined from estimates made on serial samples during transfusion.

RESULTS

Blood Examinations

The direct Coombs test was invariably positive. Very weak positives were noted in 6 cases out of 58, and these infants were all very mildly affected. However, a strong positive test was not necessarily a sign of severity.

Hæmoglobin values in cord blood were below the normal range in more than half the infants (in our laboratory the hæmoglobin level of cord blood in normal infants usually lies between 98% and 124%, 100% being equivalent to 14·8 g. of hæmoglobin per 100 ml.). The mortality was higher in infants whose cord blood was anæmic. Samples taken a few hours after birth usually showed higher values, as expected. The difficulty of diagnosing anæmia in an infant a day old is just that of trying to decide whether an adult with a hæmoglobin level of about 100% is anæmic, having been told that he may or may not have had a transfusion of three pints of blood on the previous day. (For data on the transfer of blood from the placenta to the infant see DeMarsh et al. 1942.)

The concentration of bilirubin was less than 3 mg. per 100 ml. in the cord blood of all mildly affected infants (the normal range in our laboratory is 0·5–2·5 mg. per 100 ml.). Severely affected infants had values of over 4 mg. per 100 ml., the highest being 8·1 mg. per 100 ml.

The higher bilirubin values were found in the more anæmic infants. Bilirubin values sometimes rose very rapidly after birth, and comparisons were more difficult in later samples than in cord blood.

Erythroblastæmia was invariable in anæmic infants but inconstant in mildly affected cases.

Free Rh antibody was almost invariably present in the infant's plasma, but the amount was not well correlated with the other findings.

Clinical Results

The accompanying table shows that, of the 30 infants treated by exchange transfusion, 7 died and 23 recovered. The infants that died were 1 with frank hydrops fœtalis; 3 with severe anæmia whose condition at birth was critical and who died within 24 hours of birth; and 3 less severely affected who developed profound jaundice despite exchange transfusion and died 2–4 days after birth. Only one of the 23 survivors shows signs of damage to the central nervous system.

Among the survivors are a few infants whose condition was very critical at birth. The following are examples:

Case 1.—*The mother had previously had 2 normal infants and an induced abortion. After the abortion she was transfused with three bottles of blood of unknown Rh type. This was followed by a severe hæmolytic reaction, and there is little doubt that she not only received Rh-positive blood but also was already at that time sensitised to Rh. The present infant was born 8 days before the expected date of delivery and was immediately seen to be pale and jaundiced; the spleen and liver were slightly enlarged. Blood examination 2 hours after birth showed red cells 1,150,000 per c.mm., Hb 35%, and bilirubin 11·6 mg. per 100 ml. A blood film showed that almost all the nucleated cells were erythroblasts or normoblasts, and there were 25% reticulocytes; the direct Coombs test was strongly positive. Exchange transfusion was carried out with Rh-negative blood, and at the end of the transfusion 90% of the cells in the infant's circulation were Rh-negative. However, the total hæmoglobin was only 57%, since ordinary diluted blood has been used, and a supplementary transfusion had to be given next day.* The infant's su progress was entirely satisfactory.

OUTCOME IN 63 CASES IN WHICH AN RH+ INFANT WA TO A MOTHER WHOSE SERUM CONTAINED RH ANTIBO

Type of case	No. of cases	Treatment	No. of deaths		No. of
			Within 24 hr.	At 48–96 hr.	Complete
Stillbirth and hydrops fœtalis *	7	Exchange transfusion *in 1 case*	7	..	..
Infants with initial anæmia †	18	Exchange transfusion	3	3	12
Infants without initial anæmia	11	Exchange transfusion	..	..	10
	9	Simple transfusion	..	2	7
Infants first seen after first 24 hr. of life	4	Simple transfusion	..	..	3
Infants very mildly affected	14	*No* transfusion	..	..	14
Total	63	..	10	5	46

* 5 infants born dead; 1 with hydrops lived ½ hr.: another 5 hr. and was treated by exchange transfusion.

† *Infants have only been included in this group if their hæm* was less than 65% in cord blood or less than 80% in a sample taken within 24 hr. of birth.

Case 2.—The mother's first infant was normal, but was then transfused with many bottles of blood of un Rh type. Her second infant died 4 or 5 days after b and it is recorded that it was very pale. In view of previous history the mother's third pregnancy was te at 37 weeks. The infant was pale and a little jau and examination of its cord blood showed direct test positive, Hb 59%, and bilirubin 5·5 mg. per 1 A blood film showed 20 nucleated red cells per 100 cells. At 3¼ hours after birth the plasma-bilirubi had risen to 9·3 mg. per 100 ml. An exchange tr was given, 470 ml. of blood being removed and 530 Rh-negative blood injected. By the 5th day of life infant's bilirubin concentration had fallen to 2·8 mg. *100 ml., and the infant was no longer jaundiced.* infant's hæmoglobin fell only very slowly after transfusi at 19 days of life it was still 86%; at this point no Rh cells could be detected in the circulation. By the 47th of life the hæmoglobin had fallen to 48%, but there were some Rh-positive cells present. The infant's hæm thereafter rose spontaneously, and by the age of 78 days it reached 70%. A few details are given in the following ta

Age	*Hb* (%)	*Bilirubin* (*mg. per 100 ml.*)	*Red cells* (*millions per c.mm.*)	*Rh negative cells* (*millions per c.mm.*)
3 hours ..	76 ..	9·3 ..	3·0 ..	None
5 ,, ..	121 ..	7·0 ..	5·0 ..	5·9
5 days ..	108 ..	2·8 ..	— ..	—
10 ,, ..	80 ..	0·7 ..	4·5 ..	4·5
47 ,, ..	48 ..	— ..	— ..	—
60 ,, ..	58 ..	— ..	2·0 ..	1·6
78 ,, ..	70 ..	— ..	— ..	—

At 60 days there were only 1,600,000 Rh-negat cells per c.mm. in the infant's circulation, and it m at first appear that the elimination of these cells significantly exceeded 1% a day. However, as Pick (1947) has pointed out, allowance must be made for infant's increasing body-weight. In the present c the infant had grown from 7 lb. at birth to 10½ lb the 60th day. Thus, to find the true survival-rate o must multiply 1·6 by 10·5÷7 and express this figure a percentage of 5·9. The corrected survival is then 41 which is very close to the expected figure.

INFLUENCE OF RESTRAINT ON AUTOMATIC MOVEMENTS

VALUE IN DIAGNOSIS

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RE is a functional unity in the movements of all mbs in quadrupeds and man. The fore limb (arm n) of one side and the hind limb (leg in man) of her side normally move simultaneously in the same on during bodily progression.* This has been strated also in reflexes obtained in decerebrate ls (Sherrington 1898). Arm-swinging is therefore tomatic accompaniment of walking; and Wilson observed in a case of largely right-sided parkin- n that "the left arm was always advanced to a tly greater extent than usual, and this corre- ed strictly to a slower advancement of the weak leg."

omatic arm-swinging in walking is often diminished lished in extrapyramidal lesions—e.g., parkinson- f which it is one of the earliest signs—but this also ns in severe spastic hemiparesis and in slight idal lesions. According to Monrad-Krohn (1938) novement is often absent in pyramidal and yramidal lesions.

have observed that healthy people walking while ng something heavy in one hand swing the free nore than when both arms are free; and that healthy person restraint of one arm increases the tude of swing of the other. In making this test it ntial to ensure that the restrained arm makes no ment whatever.

se observations led us to test arm-swinging in is pathological conditions, and we have found that, a patient with predominantly unilateral parkinson- alks carrying a book in his sound hand, or with hand in his pocket or resting on his back, the atic swinging of the unsound arm returns or is sed. When the sound arm is released, the swinging e unsound arm is decreased or disappears. We have the same thing in encephalitic pseudoneurasthenia, nham's chorea, and hemichorea. (In some cases of ed encephalitis, and even, in some cases of overt phalitis if the patient can walk, some days may e before this phenomenon can be observed.) But rkinsonism in which the unsound arm shows much rtonus, in cerebral hemiparesis with spasticity, in lteral pyramidal lesions without hypertonus, and in id central paralysis of the arm, restraint of the sound arm does not bring back these movements in the unsound arm.

Reflexes may be linked so that inhibition of one calls forth the other reflex. For instance, swallowing and breathing are associated reflexes in that one of them must be inhibited to allow the other to act. Now, the inhibition of breathing—e.g., in a high wind—calls forth reflex swallowing. One would therefore expect that, in walking, restraint of one of the two limbs functionally associated as already described would stimulate reflexly the action of the other pair of limbs. This has been shown to be true of the arms and is probably true of the legs also, but this is difficult to prove.

Lescenko's Phenomenon

Other associated reflexes provide similar examples. Reflex blinking of one eye in normal people is strongly linked, and takes place simultaneously, with blinking of the other eye. But Lescenko has shown that if, in some cases of parkinsonism, while the patient fixes his gaze on an object, the demonstrator lowers one of the patient's upper eyelids and lifts that eyelid again, the uncontrolled upper eyelid of the other eye is automatically lowered; and, when the controlled eyelid is lowered again by the demonstrator, the uncontrolled eyelid is automatically raised.

It seems that, the normal lowering and raising of eyelids (blinking) being extremely rapid, the slower movement of the patient's eyelids by the demonstrator constitutes a form of restraint. Now, we have shown that restraint on one side causes active movement on the other. Further, the raising of the patient's eyelid by the demonstrator restrains its lowering; therefore such restraint provokes lowering of the opposite (uncontrolled) eyelid. In harmony with this finding is the fact that, in normal people, if the demonstrator prevents the subject from closing his eyes, attempts to blink are produced which are more frequent than normal.

Abduction of Legs

Raimiste (1909) has described how, in cerebral hemiplegia, restraint of active abduction of the sound leg elicits abduction of the unsound leg. According to Walshe (1921) "diverse forms of voluntary movements against resistance may, in certain cases of hemiplegia, always elicit the same response, whereas in other cases the form of the associated reactions could be completely modified according to the form of the voluntary movement of the sound arm." In these latter movements, to which Raimiste's phenomenon belongs, two facts are important according to Walshe: "(1) in most cases of residual hemiparesis there is considerable voluntary power in the affected leg; and (2) it is impossible in these circumstances, and even in the normal subject, to adduct or abduct the extended limb without also bringing into action with equal force the corresponding muscles of the crossed leg."

We do not agree with Walshe's first remark, because we have seen Raimiste's phenomenon even when the leg has been completely paralysed. His second remark, however, is evidence that there is a certain functional connexion between the legs in symmetrical abduction and adduction, probably stronger than in other symmetrical movements of the legs.

Pathological Movements

On the other hand, involuntary pathological movements—e.g., parkinsonian tremors—can be checked, in some cases by voluntary or other synergic movements. Even tonic muscular spasm which cannot be inhibited voluntarily may sometimes be overcome by synergic movements—e.g., voluntary blinking inhibits oculogyric lateral rotation (Golmann, quoted by Astwazaturow 1929). The automatic upward rotation of the eyeball on blinking inhibits lateral rotation.

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ptionally, in animals, both limbs of one side are advanced imultaneously, as in ambling.

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the count will only approach this level after a large exchange transfusion. Thus a count of 5,000,000 Rh-negative cells per c.mm. *in the infant's circulation* could be achieved either by using donor's blood with a count of about 6,000,000 per c.mm. and carrying out an exchange of, say, 400 ml., or by using donor's blood *with a count of only 5,000,000 per c.mm., carrying out* an exchange of, say, 400 ml., and then injecting a *supplement of, say, 50 ml. of donor's blood*, without further withdrawal of blood from the infant.

It is clear that, though these are the factors which influence the concentration of Rh-negative cells in the infant's circulation at the end of transfusion, the concentration of Rh-positive cells remaining will depend on the infant's *initial* red-cell count and the volume of blood exchanged. Evidently the larger the volume exchanged the fewer will be the number of Rh-positive cells remaining.

Some of these effects are illustrated by the case reported above, where donor's blood with a red-cell count of 5,900,000 per c.mm. was used for an exchange transfusion in an infant with an initial red-cell count of 1,650,000 per c.mm. As an example, after the exchange of only 80 ml. of blood in this case, 65% of the cells in the infant's circulation were Rh-negative (see figure). According to a formula which only considers the exchange of blood in terms of volume (Wiener and Wexler 1946) this percentage exchange should only have been achieved after injecting and withdrawing an amount of blood equal to the infant's initial blood volume (probably a little over 200 ml. in this particular case).

Once an infant has been provided with a count of not less than 5,000,000 Rh-negative erythrocytes per c.mm., one can accurately predict the subsequent hæmoglobin levels by reckoning that 1% of the cells will disappear each day, and that the surviving cells will be diluted in a growing volume of plasma as the infant gains weight; an example has been given above. By the 30th day after transfusion the infant's hæmoglobin may have fallen to 60%, and it may subsequently fall a little lower. However, between the 30th and 60th days the infant's production of Rh-positive cells usually increases and no further fall in hæmoglobin occurs. Since the normal infant's hæmoglobin may fall to 70% between the 30th and 60th days values between 50% and 70% cannot be considered as very low, and it does not seem to be necessary to retransfuse infants at this stage unless the hæmoglobin falls below 50%.

Indications

The very mild course pursued by hæmolytic disease in all infants whose cord hæmoglobin was above 15 g. per 100 ml. and cord-bilirubin concentration below 3 mg. per 100 ml. and the stormy or fatal course pursued in infants whose cord blood showed anæmia or bilirubin values of over 4 mg. per 100 ml., has led us to conclude that the severity of a case of hæmolytic disease of the newborn can be assessed reliably from an examination of cord blood.

The value of examining cord blood for erythroblastæmia was stressed by Javert (1942), who also noted a slightly reduced hæmoglobin value and a considerably increased icteric index in a series of cases. Sadowski et al. (1947), who found bilirubin values between 4·9 and 8·1 mg. per 100 ml. in 3 severely affected infants, suggested that estimation of the cord bilirubin might be the best method of making an early diagnosis. Similarly, Pickles (1947) found plasma-bilirubin values between 3·0 and 7·5 mg. per 100 ml. in the cord blood of a series of affected infants.

We suggest that, if exchange transfusion is to be used as a method of treatment, it should only be carried out if the hæmoglobin of the cord blood is definitely below the normal range (say, below 14·5 g. per 100 ml.) or if the bilirubin value of the cord blood is 4 mg. per 100 ml. (normal range, say, 0·5–2·5 mg 100 ml.). When the hæmoglobin is only just below per 100 ml., or the bilirubin concentration is 3–4 100 ml., it is useful to examine a blood film. A excess of nucleated red blood-cells (say, more 10 per 100 white cells) should decide the issue in of an exchange transfusion. If cord blood has examined, the appearance of definite jaundice skin within 12 hours of birth in an infant whose gives a positive direct Coombs test is an in for exchange transfusion.

SUMMARY

There are three grounds upon which exchange fusion might be advocated for the treatment of hæmolytic disease of the newborn:

(1) To raise the hæmoglobin level rapidly increasing the blood volume. This might be in infants severely anæmic at birth, since found that these infants may have a raised pressure.

(2) To reduce to a minimum the amount of b of Rh-positive cells during the critical first of life, since it is possible that the blood d in this phase is indirectly responsible for the damage.

(3) To provide the infant with such a conce of Rh-negative cells by a single operation that no transfusions will be needed. In our experience proved to be a most substantial advantage. believe that, on this ground alone, exchange should receive widespread trial.

The percentage exchange effected by withdra infant's own erythrocytes and replacing Rh-negative erythrocytes depends on the infant's red-cell count and the donor's red-cell count on the total volume of blood exchanged. Thus, *infant is anæmic and the donor plethoric*, it easier to secure a good percentage exchange of and vice versa.

It is important not only to secure a good exchange of Rh-negative for Rh-positive cells to leave the infant with a high absolute con of Rh-negative cells to tide it over the period, which may extend to 40 days or more, which it is unable to maintain a satisfactory tion of Rh-positive cells. This objective is best by the use of donor's blood with a count of 5, 6,000,000 erythrocytes per c.mm.

The severity of a case of hæmolytic disease newborn can be assessed reliably from an ex of cord blood; some criteria are given.

A favourable impression has been formed clinical effects of exchange transfusion, but the of this treatment to lower mortality and mor must still be considered unproved. Meanwhile, we have not personally encountered any ill effects it, we consider that it can justifiably be used most convenient method of treatment available theless it is not a trivial procedure, and it should fore be reserved for cases where a single trans Rh-negative blood is not likely to suffice.

Most of the infants were treated in the obstetric de of the Postgraduate Medical School of London, but were treated in Kingston Hospital, and a few of the cases in St. Helier Hospital. We wish to thank the and nursing staffs of these departments for their Dr. L. K. Diamond, of Boston, for generous gifts of a and for supplying us with information about his te at an early stage of his own work; the donors of the Red Cross Society's Greater London Blood Transfusion and the North and South London Blood Supply De supplying Rh-negative blood at short notice.

References at foot of next page

an acid reaction. A trace of albumin be found in cases with much ascites lema of the legs. The stools may ne bulky, clay-coloured, and offensive.

thology.—Eggel (1901) found, in an sis of a series of cases, that 68% hepatomas and 32% arose from bile-duct epithelium (cholangioma); eas in Berman's (1941) series of 25 psies, 24 were hepatomas and 1 was olangioma, and in all cases micro- y showed cirrhosis of the liver.

Berman's series (1941) 57% had ahepatic secondary deposits—in the in 27 cases, and in the regional h-glands in 8. Metastases may be d in the ribs or the brain. Eggel) reports that 66% had extrahepatic stases, and that the spread may place along the lymphatics to the glands in the h, the upper part of the abdomen, or the thorax, ia the blood-stream by direct extension into the l and hepatic veins, giving rise to fresh growths e liver or to secondary deposits in the lungs. The cted series of children included 52 cases of hepatoma, 3 of cholangioma, 22 being unclassified. In 27% ese cases there were extrahepatic secondary deposits. *eatment* is purely palliative.

CASE-RECORD

boy, aged 15, born on June 4, 1930, volunteered with chool group for mass miniature radiography in March, and was recalled for a large film of his chest and for er clinical examination. I first saw him on April 11, when he was completely symptomless but admitted dull pain in the epigastrium six months earlier, which asted a fortnight and had not recurred. His weight was mary. He gave a past history of "influenza" in mber, 1945, but had recovered quickly from this.

examination.—He was thin but not anæmic. No ged glands could be detected in neck, axillæ, or groins. enlarged two fingerbreadths below costal margin; spleen alpable. A localised swelling in epigastric region moved the liver on respiration; it was hard and craggy, with egular and nodular surface. It was not cystic and did ulsate. Chest: grossly diminished breath sounds, with ushed vocal resonance over right lower lobe, anteriorly posteriorly; no adventitious sounds.

ysical signs of liver tumour suggested malignancy and patient was admitted to hospital.

vestigations (April, 1946).—Erythrocyte-sedimentation (E.S.R.) (Westergren) 126 mm. in 1 hour. Wassermann tion negative. Blood-count: red cells 5,181,000 per n.; Hb 92%; colour-index 0·9; white cells 4400 per m. (polymorphs 60%, large lymphocytes 8%, small phocytes 23%, large mononuclears 4%, eosinophils 5%). iography of chest (April 2, 1946) showed two large aded and clearly defined tumours in the anterior part of lower lobe of the right lung, suggesting hydatid cysts . 1 and 2). Rest of lung fields clear, with no evidence of ase.

dmitted to the Brompton Hospital on July 10, 1946, was febrile (temperature 100°F) and pale, with female s and gynæcomastia. There was a large slightly tender , moving with respiration, in the epigastrium, and the was much enlarged. Testes small: female distribution ubic hair. Poor air entry at right base of chest.

vestigations (July, 1946).—E.S.R. 140 mm. in 1 hour. d-count: slight hypochromic anæmia and a lympho- sis of 37%; Casoni test and Friedman test negative; ding and clotting times normal, and no abnormality utum. Radiography "showed an opacity in the right r zone situated anteriorly and also a rounded tumour he abdomen. It was suggested that, if the opacity in chest was intrapulmonary, hydatid disease should be idered, but primary mediastinal teratoma is the most y diagnosis." (L. G. B.)

iagnostic pneumoperitoneum suggested that the epigastric s was connected with the liver but not with the mass in lower zone of the chest on the right side.

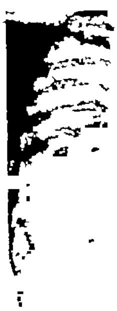

Fig. 1—Postero-anterior view (April 2, 1946) showing large round mass in lower lobe of right lung.

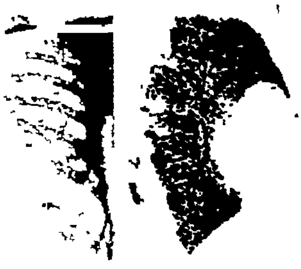

Fig. 2—Right lateral view (April 2, 1946) showing two rounded tumours situated anteriorly in lower lobe of right lung.

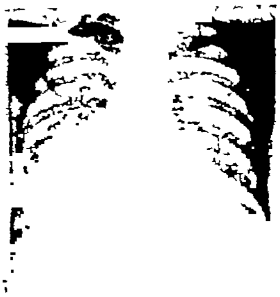

Fig. 3—Postero-anterior view (April 30, 1947) showing increase in size of tumour in lower lobe of right lung. Rest of lung field remains clear. Diaphragm is raised owing to enlargement of liver.

Aspiration biopsy of the mass in the abdomen produced tissue characteristic of primary carcinoma of the liver (hepatoma). Section was composed mainly of blood-clot. Tumour cells showed very considerable irregularity in shape and size and were closely packed together; some of them were binucleated.

Patient was referred for deep X-ray therapy, but this was ineffective and was therefore discontinued. He was discharged on Aug. 15, 1946, and the prognosis was considered hopeless.

Progress.—He remained symptomless and enjoyed good health but did not return to school. He spent a great deal of time motor-cycling and was leading an active life out of doors. His weight slowly increased, from 6st. 7¼ lb. on Oct. 31, 1946, to 6st. 10½ lb. on April 30, 1947.

In October, 1946, he had a short sharp attack of pleurisy on the right side, but quickly recovered. In November he was brighter and active, but had no symptoms apart from a recent gastric upset with vomiting and diarrhœa, and loss of 2½ lb. in 3 or 4 weeks. This weight was regained and at Christmas he felt very well, and was motor-cycling. At the end of April, 1947, however, he was much weaker, with anorexia and attacks of nausea and vomiting about once a week. He was now thin and apathetic, with no interest in his surroundings. He moved with difficulty, and it required great effort on his part to get on to the examination couch. The liver now almost filled abdomen, and the tumour in the epigastrium was larger and possibly slightly tender. A small amount of ascites was probably present.

Investigations (May 5, 1947).—van den Bergh and Fouchet's reactions negative. Blood-count: red cells 4,340,000 per c.mm.; Hb 68%; colour-index 0·79; hæmatocrit 34%; mean corpuscular volume 79·0 c.µ.; mean corpuscular Hb concentration 29·0%; E.S.R. (Wintrobe) 3 mm.; white cells 8200 per c.mm. (polymorphs 70%, lymphocytes 20%, large monocytes 9%)—a normocytic hypochromic anæmia.

The low E.S.R. is rather misleading in view of the malignant condition. Next day the E.S.R. was repeated by the Westergren method and was 120 mm. in the first hour.

Radiography of chest (April 30, 1947) showed that the secondary growths had not increased much (fig. 3).

The boy died on July 5, 1947, almost sixteen months after his first X-ray examination. Necropsy was refused.

COMMENT

There are several interesting features in this case: (1) The striking lack of development of male sex characteristics. (2) The misleading maintenance of body-weight, probably because the increase in size and weight of the liver balanced the obvious loss of flesh. (3) The long period before the development of symptoms, in spite of the two large secondary deposits in the lung. The first and single gastric upset appeared in November, 1946, seven months after his first clinical examination. It was not until April 28, 1947, a year after he was first seen, that he had regular attacks of nausea and vomiting at weekly intervals, and he died about two months later. (4) Comparison of the X-ray film of April, 1946, with that of April, 1947, shows that the two large secondary deposits had increased but slightly during the year.

DISCUSSION

If we consider the effect of restraint of the sound limb on automatic movement of the unsound limb, as already described, Raimiste's phenomenon, Walshe's second remark, and the fact that restraint of automatic arm-swinging on the sound side does not influence that on the unsound side in pyramidal lesions, we can conclude that restraint of either voluntary or automatic movements on the sound side elicits similar movements on the unsound side if those movements have been reduced or lost owing to a lesion of the motor tract (pyramidal or extrapyramidal) controlling those movements and when those movements are functionally connected.

Consequently the effect of such restraint is of diagnostic value where it is uncertain whether diminution or loss of movement is due to a pyramidal or to an extrapyramidal lesion. In pyramidal lesions, whether paresis of the arm is spastic or flaccid, restraint of the sound arm does not bring back the absent arm-swinging. Walshe (1921) found no sign of an associated reaction in arm or leg in flaccid paralysis, and concluded: "Some degree of hypertonus in a case of hemiplegia is an essential preliminary to the development of an associated reaction . . . the higher the degree of spasticity, the more forceful and the longer lasting will the associated reaction be."

In contrast to this, the absence of pronounced hypertonus in extrapyramidal lesions is a necessary condition to enable restraint of the limb on the sound side to bring back movements in the limb on the unsound side.

Most workers consider that the disappearance of arm-swinging represents a primary disturbance. There is no doubt that hypertonus also impedes these movements. Froment and Gardère (1921) consider that even in cases without evident hypertonus there is latent rigidity. Noica (1936) holds the same opinion and says that, where arm-swinging has been lost and yet hypertonus is not evident, hypertonus will develop later, at first only in walking and only in the proximal parts.

The fact that arm-swinging can disappear in unilateral pyramidal lesions with minimal paresis and no evident hypertonus might be regarded as supporting Wilson's (1928) opinion that arm-swinging is not purely automatic. But against this assumption is the observation that, in unilateral parkinsonism, deliberate swinging of the unsound arm inhibits arm-swinging by the sound arm. This harmonises with the fact that, in normal people, automatic movements are inhibited by attempts at voluntary control, and with our observation that, in unilateral parkinsonism, deliberately increased arm-swinging on the sound side does not affect arm-swinging on the unsound side.

These investigations cannot be regarded as complete. It would be especially interesting to study cases of post-concussional Mann's syndrome. In unilateral cerebellar lesions Wartenberg (1930), Marburg (1936), and Holmes (1946) find that arm-swinging disappears, whereas Grinker and Levy (1943) seem to think that it increases because of hypotonus. In a patient with a bilateral cerebellar lesion, more pronounced on the left side, we found that arm-swinging was diminished on the left side and that when the right arm was restrained arm-swinging increased in the left arm.

SUMMARY

Restraint of automatic arm-swinging on one side in normal people reinforces arm-swinging on the opposite side.

Restraint of arm-swinging on the sound side in unilateral extrapyramidal lesions—e.g., incipient parkinsonism, chorea minor, and encephalitic pseudo-neurasthenia—brings back the arm-swinging on the affected side if there is not much hypertonus.

In unilateral pyramidal lesions such restraint such effect, regardless of the state of muscular tone.

This test is of diagnostic value where it is de whether loss of arm-swinging on one side is due pyramidal or to an extrapyramidal lesion.

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PRIMARY CARCINOMA OF THE L

IN A BOY AGED 15

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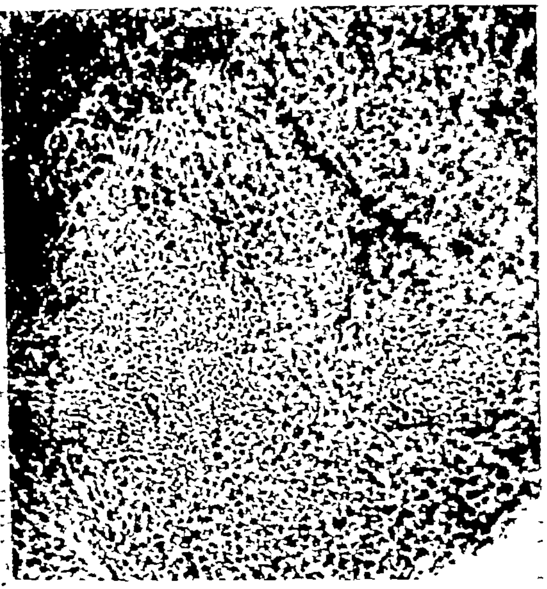
The ratio between primary and secondary c of the liver has been estimated as between 1: 1 : 40. In 18,500 necropsies at Guy's Hospital (White 1908) 24 cases (0·13%) of primary car of the liver were found, and the incidence in necropsies at the General Infirmary, Leeds (1922) was the same. Data from several Ame European hospitals revealed 144 cases (0·21%) in necropsies, and reports collected from Asia and give 416 cases (1·05%) in 39,701, and from a hospital 134 cases (0·76%) in 17,664 necropsies. (1940) estimates that primary carcinoma of the over forty times more frequent in some of the p races than in the European.

The disease occurs mostly in or after mi and is said to be rare before 40 years of age. recorded case was in a baby girl aged 5 weeks (1912). Berman (1940), in a series of cases in natives, found that 82·6% of the patients were of age or less, while the highest incidence was age-group 21–30. Steiner (1938), in a critical of the literature, found 77 proved cases in up to 16 years of age, 53% of them in children the age of 2 years.

This disease is seen more often in men than in and of affected children Steiner (1938) observed 68% were boys.

Symptoms.—There are no characteristic sym Dull pain is a frequent feature and is referred to liver region. *Usually there are* gastric upse anorexia, nausea, vomiting, diarrhœa, or consti Jaundice and ascites are uncommon. The a duration of life after the onset of symptoms is months. No recovery has yet been reported. incidence of symptoms in Berman's (1940) 42 cases abdominal pain in 90%, asthenia in 86%, and d especially on exertion, in 26%; but this was a symptom.

Physical Signs.—Most patients do not lose before admission to hospital but when bedridden weight rapidly. The liver is always enlarged and t Jaundice was noted in 43% and ascites in 55% cases (Berman 1940). Dilated superficial abdominal and œdema of the ankles and legs are found commonly, and hæmatemesis rarely. Usually the perature is either normal or subnormal, but *some* pa are febrile. The urine is unaffected in the early but later is diminished in amount and of high



1—Liver-biopsy specimen showing focal granulomatous lesions. (× 95.)

lers containing beryllium were prepared, ground, and ed in his laboratory, only a few feet from his bench. undoubtedly increased the risk to which he was exposed. r December, 1942, his contact with phosphors was gible; for the next two years he worked in other rooms only occasionally chanced to walk through the laboratory. November, 1945, three years after his last significant sure, he had a feverish cold, and a dry cough developed n he returned to work three days later. After another th the cough became productive, yielding a little yellown sputum, and he began to be dyspnœic on exertion; ould neither run for a bus nor climb a hill. At the same he began to lose weight rapidly, and by February, , was already 23 lb. below normal. Radiography of his t then led to a tentative diagnosis of miliary tuberculosis. could walk only about 30 yards on the level. He was itted to hospital, where miliary tuberculosis was excluded pulmonary sarcoidosis diagnosed. All of many sputum minations were negative for tubercle bacilli; a Mantoux at 1:1000 dilution was positive; and a blood-count wed 6,000,000 red cells per c.mm. and Hb 130%. The ient continued to be seen at various hospitals for a year and alf after his discharge. During this time his weight was still ing, his appetite was poor, and he had to be absent from rk repeatedly because of attacks resembling acute bronitis. His chief symptom, which varied in severity, was ays dyspnœa on exertion and at rest.

n examination in February, 1948, I found that he weighed ly 7 st. 5 lb., having lost 51 lb. in all. He was dyspnœic rest and slightly cyanosed, but there was no clubbing of fingers. The cardiovascular system was normal except an accentuated second heart sound in the pulmonary a. The chest expansion was only 1 in. The percussion te of the chest was resonant, but multiple rhonchi and rse crepitations could be heard in all areas. The liver edge s palpable 1½ in. below the costal margin, but the upper it of hepatic dullness in the chest was displaced downwards. e spleen was not palpable, and only one small lymph-gland s felt in the neck. No glands were discovered elsewhere, l the parotids and uveal tracts were normal.

He was again admitted to hospital. During a stay of three ks there was no fever, but the respiratory-rate at rest ied remarkably, between 18 and 38 per min. On the htest exertion he was dyspnœic to the point of distress.

ital capacity: 1470 c.cm. A healthy man of this patient's ght and weight might have had a vital capacity of 3800 m., calculated from surface area by the formula of West 20). The capacity recorded was only 39% of this.

Sputum: repeatedly negative for *Myco. tuberculosis*.

Erythrocyte-sedimentation rate: 7–13 mm./1 hour (Wintrobe).

Mantoux test: 1/10,000 negative and 1 1000 negative.

Blood-count: Hb 112%, red cells 6,412,000 per c.mm., white cells 5300 per c.mm. (polymorphs 44%, eosinophils 1%, lymphocytes 45%, large hyaline cells 10%).

Electrocardiogram: some right ventricular preponderance.

Circulation-time: arm to breath (ether min. 5) = 7–9 sec., arm to face (histamine phosphate 0·1 mg.) = 25–28 sec.

Glucose-tolerance test: within normal limits.

Liver-function tests: van den Bergh, indirect reaction 0·5 mg. bilirubin per 100 ml. Alkaline phosphatase, 6 units. Thymol turbidity, 6 units. Cephalin cholesterol flocculation, 1. Serum colloidal gold, 0.

Plasma-proteins: total 6·6 g. per 100 ml. (albumin 4·4 g. and globulin 2·2 g. per 100 ml.)

Beryllium in urine (spectrographic technique): on admission, nil detected. After a course of dimercaprol (BAL), nil detected.

Radiography: X-ray films of the patient's hands and feet in April, 1946, and April, 1948, showed no abnormality.

Radiography of his chest four months after the onset of his illness showed a fine punctate or granular marking scattered throughout both lung fields, the lesions being 0·5–1·0 mm. across. The cardiac outline was normal. Eight months after the onset there was a similar uniform fine punctate marking, with some evidence of a reticular pattern. Seventeen months after the onset there was more definite appearance of reticulation in all areas with some small scattered nodules, 2 mm. across, at the periphery of the mid-zones. The right interlobar septum had been drawn upwards. There was broadening of the upper half of the cardiac shadow, especially in the region of the pulmonary artery; the hilar vessels were prominent. Twenty-one months after the onset more definite fine nodulation was apparent in the upper mid-zones, though the other appearances were unchanged. Thirty months after the onset there was some clearing of the lower zones, where the appearances suggested emphysema. In the upper and mid zones there was a coarse reticular pattern with much increase of linear striæ, suggesting fibrosis; nodulation was less in evidence. The diaphragm was flattened in the shape of a cone, the mediastinal shadow was broad, and the hilar vessels were very prominent. There was no enlargement of the left auricle on screening in the oblique positions with barium emulsion in the œsophagus.

Drill biopsy of liver showed focal granulomatous areas scattered throughout the tissue. These areas consisted mainly of macrophages and small round cells, with a few fibroblasts and occasional epithelioid cells, but no giant cells. There was no necrosis or fibrosis. The surrounding liver parenchyma was normal (figs. 1 and 2).

Ultraviolet microscopy showed aggregates of sharply defined spiculate particles with a bright white fluorescence in the middle of some of the granulomatous lesions. These were seen only in the abnormal tissue. In specimens of normal liver obtained from necropsies and examined by this method,

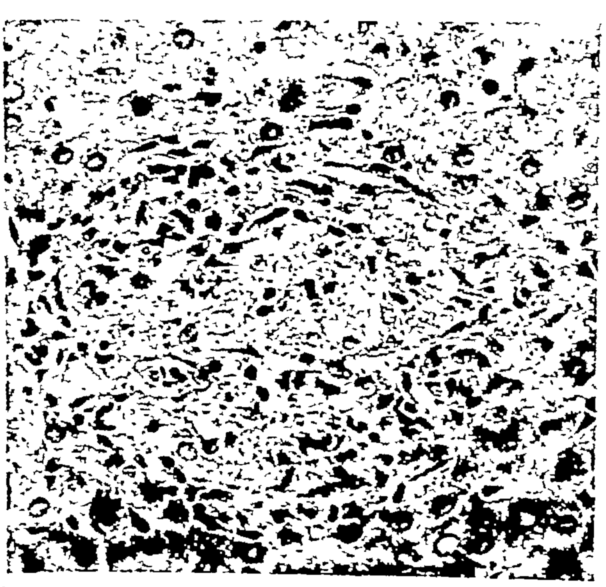


Fig. 2—The smaller of the two granulomatous lesions shown in fig. 1. (× 450.)

(5) The absence of icterus throughout, both clinically and by van den Bergh reaction.

SUMMARY

A case is reported of primary carcinoma of the liver detected in a schoolboy aged 15 by a mass miniature radiography unit.

Radiography showed two clearly defined tumours in the lower lobe of the right lung. The rest of the lung fields was clear. An apparently malignant tumour of the liver was found on clinical examination. Aspiration biopsy confirmed the diagnosis.

The boy led a normal symptomless life for about a year, but then his condition rapidly deteriorated, and he died about sixteen months after the original radiography. There was no jaundice, and the metastases in the lung increased but slightly.

I wish to thank Dr. T. H. Gillison, of Ilkeston, Derbyshire, for his keen coöperation and the case-record; Dr. W. D. Brooks for allowing me to quote the findings while the boy was under his care in the Brompton Hospital; and Dr. L. G Blair for the radiological reports.

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DELAYED PNEUMONITIS IN A BERYLLIUM WORKER

REPORT OF A CASE

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RECENT reports from the United States show that the handling of beryllium compounds is attended by a risk of dermatitis or of respiratory disease. This had already been discovered by Weber and Englehardt (1933) in Germany; and Gelman (1936) in Russia, and Marradi Fabroni (1935), experimenting with animals, had suggested calling the lung disease "berylliosis," but no reports appear to have come from Europe since 1943. American writers have lately helped to clarify the clinical picture, and to some extent the pathology, of these diseases as they affect man. Nevertheless, some of the ætiological factors have still to be discovered.

In the 'twenties and early 'thirties negligible quantities of beryllium compounds were used in the United States, but during and since the late war the consumption has risen steadily, and with it the incidence of these occupational diseases. Two of the principal industries now concerned are those in which fluorescent lamps and copper alloys are made. To supply them, several factories have been engaged in extracting beryllium from ore, and it was here that the hazards were first encountered.

In Great Britain the use of beryllium has lagged somewhat behind, especially in war-time, for reasons of expediency. A few of the compounds, however, have been used experimentally here from about 1936 onwards. Developments in the British fluorescent lamp industry have been rapid of late, and the commercial use of the phosphorescent powders which contain beryllium has already begun. The more this element is used in this country, the more likely are we to have to share the American experiences of its toxicity.

Van Ordstrand et al. (1943) described "chemical pneumonia" in 3 men extracting beryllium oxide from ore. The disease came on soon after exposure, was acute, and was characterised by cough, mild pyrexia, and dyspnœa. Van Ordstrand et al. (1945) reported 38 similar cases and 90 others of nasopharyngitis and tracheobronchitis; most of these came from the industry, but in some there had been exposure and fumes in the preparation of pure be and the making of beryllium-copper alloys. 5 deaths.

Hardy and Tabershaw (1946) described, as a clinical entity, "delayed chemical pneumoni occurrence of 17 such cases in one fluo factory in Salem, Massachusetts, suggested phosphorescent powders used there were to the one chiefly handled was a mixed silicate beryllium, and manganese. There were 6 deat important series, and several survivors were left incapacitated. Pascucci (1948), in a later f which also included 15 fresh cases, reports of the patients have died and 30% are still The remarkable feature was the delay between to risk and the appearance of symptoms. In one the interval was three years. Wilson (1948) s the delay may be as long as six years.

In September, 1947, an exchange of info the Sixth Saranac Symposium of the Edward Foundation, Saranac Lake, N.Y., indicated that any of the beryllium compounds in use in indu be handled with absolute safety. The soluble sal as sulphate, fluoride, and oxyfluoride, had already held responsible for the dermatitis and for much of acute respiratory disease (Gelman 1936 and workers). But fresh evidence now suggested that of both acute and delayed respiratory disease had from working with beryllium compounds, solu insoluble, in most of the industries concerned. most but not all of the acute cases had come factories where beryllium oxide was extracted fro whereas *most but not all of the delayed* cases had from the lamp industry. Recent or past expos beryllium compounds was the one factor com all the many cases then under discussion. The also reason to think that certain people were un susceptible, for "neighbourhood cases" were d in which the victims could only have been ex very slight risk, because they lived close to fact had never been inside them. The diagnosis in least of such cases was supported by necropsy

Gardner (1946) had already estimated that the of authentic cases of delayed pneumonitis was 60. referred to typical cases from the radio-valve neon-sign industries besides those already mentio

Stimulated by these accounts and by the lack of reports from the United Kingdom, I began to inquiries in some British factories, and was soon a man who had once worked with beryllium comp and who was now said to be seriously incapacitated b "sarcoid." Further investigation suggested that his was one of delayed pneumonitis as just described; may be the first to have occurred in Great Britain.

CASE-RECORD

A physicist, aged 30, was engaged in research on fil and mercury-vapour lamps from his graduation in until 1941. He was slightly exposed to dust between *and 1941, when he was filling some 200 lamps* with pow sulphides of zinc and cadmium. He noted no ill effects this. Between December, 1941, and December, 194 worked on the development of tubular fluorescent He handled about *500 tubes, which had* already been internally with the phosphorescent powders containing beryllium manganese silicate and magnesium tun He had to clean the last 3 inches of each tube with a du from time to time he shook out the *duster and* a cloud of arose. The next stage—the sealing-in of electrodes exhaustion of the tube—was not without risk, because sometimes had to suck at a side tube, and could have in powder. He was working in a small *laboratory*, but the co processes were all done in a separate room. During Oc and November, 1942, small quantities of these ph

egree of exposure needed for this dust to cause harm
ich less than that usually needed to bring about
ational pulmonary disease. Cough, dyspnœa, and
ne loss of weight were the chief clinical features.
graphy revealed extensive bilateral pulmonary
e. Granulomatous lesions were found in the liver
ut biochemical evidence of liver disorder.

commercial use of beryllium has expanded so
in the last three years that further cases may be
ted in Great Britain. If the onset of the disease can
layed as long as six years, the ætiology may not be
cted unless an adequate history is taken of the
nt's occupations.

here possible, substitution of other compounds in
of those of beryllium is clearly the best preventive
ure. In processes where this element must still be
vigorous suppression of all dust and fumes, and
ar medical supervision of workers are necessary.
prognosis of this disease is poor and treatment
ctual; the disability that is left, as in the present
may be serious and permanent. Legislation to
de for compensation might perhaps be considered
before the occurrence of any *extensive outbreak of*
in Great Britain.

ish to thank Dr. Donald Hunter, director of the Depart-
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; Dr. James Maxwell for allowing me access to the
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ute for Medical Research, for the photomicrographs.

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. . Many thousands of hours of the time of the school
cal officers and nurses have been lost due to our failure
ke the family as the unit. In all our work the golden
would be to do what is best for the family, for instance,
e question whether the child should attend a nursery
l should be judged on its merits—in some cases the
y life would be benefited by a child attending, in others
the reverse. The pros and cons must be measured
he individual child and family. With the exception of
parents with diseased minds who are deliberately cruel;
most any cost, the family should be kept together.
e must intensify our efforts to help the problem families
ir own homes, as is done by the Family Service Units.
must teach the mother—this does not necessarily mean
ing her—we must help her by showing how she could
ge better in her (perhaps) poor home, use the existing
n range and the defective tools with which she has
her jobs; or perhaps she may need help and rest
a rehabilitation centre, such as Brentwood, can give,
she may take her children and where she will be taught
raft in the right way, by the right people, and be
ready to make a fresh start. Our aim must be to
ure the mother'—to use the greatest force in the
, mother love. If we teach the mother rightly she will
e job of teaching the children for us, and we must
mber that the teaching she gives goes on all the time."
J. L. BURN, *J. R. Inst. publ. Hlth*, October, 1947.

Reviews of Books

Treatment of Heart Disease

WILLIAM A. BRAMS, M.S., M.D., PH.D., associate professor of medicine, Northwestern University, Chicago. London: W. B. Saunders. 1948. Pp. 195. 17*s*. 6*d*.

WRITING as a practical clinician, and basing his work upon his own experience, Professor Brams has produced an excellent textbook. Dogmatic without being intolerant, comprehensive yet never diffuse, he gives the medical student and the general practitioner the information they need for dealing with patients with heart disease. One of his great merits is that, unlike many writers of textbooks on therapeutics, he has restricted himself to his subject and avoided unnecessary discussions of clinical and diagnostic problems. A long first chapter on the "pharmacologic action of drugs used in the treatment of heart disease," saves much unnecessary repetition in the sections dealing with individual disorders.

Major Endocrine Disorders

(2nd ed.) S. LEONARD SIMPSON, M.A., M.D., F.R.C.P., physician, Willesden General Hospital. London: Oxford University Press. 1948. Pp. 552. 42*s*.

THIS is not a textbook of endocrinology: and indeed there is no reason why it should be, except that no British author has yet attempted to write one, which is perhaps a pity. Since he is not writing a textbook, Dr. Simpson is under no obligation to give a carefully balanced account of the subject, with much space for the common or important aspects, and little for rarities, museum pieces, or details of tests performed in this country by perhaps no more than a score of specially trained experts. Instead he treats the specialty from the personal point of view, emphasising aspects in which he is specially interested, such as the adrenal cortex. Other aspects—such as recent work on the œstrogens—in which he has no particular interest are treated summarily and with less care for accuracy. It is as though he had set himself to clarify his own views by putting down the product of his own clinical experience and of his wide reading of the literature. Unless the reader appreciates this personal approach he may be slightly irritated by the frequent use of the first person singular. The autobiographical exposition, however, has advantages as well as disadvantages. Dr. Simpson has taken an active interest in endocrinology for many years, and this account of his experience represents very fairly the views of an enlightened physician who keeps abreast of recent advances in the subject. Though it is a second edition, the book has been virtually rewritten and is now at least four times as big as it was in 1938. There are many excellent illustrations and the standard of production is high.

Surgical Treatment of the Abdomen

Editors: FREDERICK W. BANCROFT, M.D., F.A.C.S., professor of clinical surgery, New York Medical College: PRESTON A. WADE, M.D., F.A.C.S., associate professor of clinical surgery, Cornell University. Philadelphia and London: J. B. Lippincott. 1947. Pp. 1026. £5 10*s*.

THIS large, and in many ways admirable, American textbook of operative surgery has a misleading title. It includes sections on anæsthesia, on the principles of surgical treatment, and on the mouth and œsophagus; but it does not cover the abdomen completely, because the urogenital systems, male and female, are not considered, nor is the abdominal wall. This may perhaps be because it is one in a series of volumes on operative surgery; but it means that the surgeon who wants information on nephrectomy or the treatment of hernia will not get it here. The section on anæsthesia seems too short for the specialist anæsthetist and too theoretical for the man who is compelled by circumstances to administer an anæsthetic and who wants information on how to do it. The chapters on local and regional anæsthesia, however, will be useful to the general surgeon. The section on general topics carries an excellent chapter on the fundamental principles of surgical technique, by Stevenson and Reid, but elsewhere is inclined to give single fluorescent bodies were sometimes seen in the sinusoids and small aggregates in the region of the portal vein, but these bodies were rounded and often had a yellowish tint. Possibly the particles within the lesions in the present case consisted of the original fluorescent powder, but the test cannot yet be considered conclusive.

Progress.—The patient has not improved at all since his admission to hospital. He is remarkably dyspnœic, can do light laboratory work, but is often absent as a result of minor respiratory infections which drive him to bed.

CLINICAL PICTURE

Hardy and Tabershaw (1946) originally reported 17 cases from one factory. Since then, others have occurred there, and men and women engaged in all the stages of fluorescent lamp making have been affected. The original 17 were variously exposed to zinc beryllium manganese silicate for from 5 months to 5 years. The present patient was exposed to just the same risk for a year, and there was a delay of 3 years before his first symptoms appeared; this is also in keeping with the other cases. Hardy and Tabershaw observed that loss of weight at the onset, dyspnœa on exertion, cough, and fatigability were present in nearly all their patients. They wrote of weight losses of 20, 34, and even 40 lb. within the first year of illness. Adventitious sounds were heard in the chest in 13 of their cases, tachycardia was present in 10, and an accentuated pulmonary second sound in 6, and an abnormally high resting respiratory-rate was found in 10 out of the 11 cases in which it was recorded. The liver was enlarged in 2 cases, and the spleen in 2. In only 2 patients could adenopathy be found, and in 2 there were skin lesions which later proved to be granulomatous. The clinical findings in the present case agree very closely. Though anorexia was not an outstanding symptom, weight loss, dyspnœa, and cough were; indeed, the patient had lost 23 lb. in the first three months, and 51 lb. within 2 years. He had no generalised adenopathy and no splenomegaly, but the edge of his liver was palpable, and a biopsy specimen contained granulomatous lesions. Hardy and Tabershaw refer to one necropsy in which granulomatous tissue was found in the liver, lungs, and hilar glands, and Hardy (personal communication 1947) found similar granulomata in liver-biopsy material from a later case.

The radiographical appearances in Hardy and Tabershaw's series of cases were described (by Wilson and Sosman) as being in three stages: (1) "granularity," (2) a superimposed reticular pattern, and (3) nodulation. The appearances in the present case do not correspond exactly to these stages; for, though there are signs of "granularity" and reticulation, the nodular stage is less pronounced than in some of the original films which I have seen. However, Wilson (1948) now allows that not all cases progress in the three stages originally described, and he adds a further stage of coalescence of lesions in the upper zones, with emphysema at the bases, just as was seen in the later films in the present case.

The chronicity of the disease in this case, and the serious residual disability, are typical of many. In short, there appears to be a sufficient resemblance between this case history and those of others who had delayed chemical pneumonitis to justify making the same diagnosis. Consequently, the disease must be attributed to the patient's former occupation.

DIAGNOSIS

The present case was first tentatively diagnosed as one of acute miliary tuberculosis on radiological grounds; later it was called Boeck's sarcoidosis. This is of interest because these diagnoses were made at first in the earliest American cases. Indeed it was only when a number of alleged cases of "sarcoidosis" occurred together in one factory that this diagnosis was questioned occupational ætiology suspected.

Miliary tuberculosis may be excluded by the of the typical pyrexia or other evidences of a gro process, and eventually on the course of the The resemblance to Boeck's sarcoidosis, ho undeniable, and a differential diagnosis may easy to make, particularly since both disease granulomatous hepatic lesions. Schaumann (Nickerson (1937), van Buchem (1946), and oth described these lesions in necropsy material from of sarcoidosis, and Scadding and Sherlock (1 found them in biopsy specimens.. In the pre the radiographical appearances also could hav taken for those of pulmonary sarcoidosis, though latter disease there is usually a contrast between subjective symptoms and the grossly abnormal findings (Reisner 1944). Moreover, in the pre there were no skin or ocular lesions, no ad and no abnormalities of salivary glands or of the loss of weight was remarkably severe, and t weakness, tachypnœa, and a residual disa greater than would be expected in sarcoidosis clinical features therefore make the latter unlikely, and a positive Mantoux reaction is and normal radiograms of the extremities are evidence against it.

Finally, there is the histology of the granulom the liver, in which there is pleomorphism and th consist main [illegible] and fibroblasts, considerable [illegible] but no giant In the lesions of sarcoidosis it is usually reported the cells are mostly epithelioid cells, with giant but with less round-cell infiltration.

The other differential diagnoses to be considered generalised carcinomatosis, the pulmonary mycoses, the pneumonoconioses. The last-named could be exc by the occupational history. The acute pneum beryllium workers, too, is differentiated by the its onset, which is never much delayed, and by that it usually resolves satisfactorily if the p given rest and removed from exposure. Valvul disease with failure may be suggested by the c dyspnœa, and radiographical appearance of the but in the present case the other typical sig absent.

The urine of this patient contained no beryllium when tested by the most sensitive method known. however, more than 5 years had elapsed since his exposure, it is reasonable to assume that any ber not fixed in the tissues would have been excreted before. The total absorption is unlikely to have ex a few milligrammes.

This disease always presents clinically as one affects the lungs, but granulomata have also been det in liver, glands, and skin; hence the pulmonary l appear to be only part of a more generalised patholo condition. Experiments on animals may event explain the process involved. It is of interest to spe whether beryllium compounds elicit this respon direct action or by sensitising the tissues to some o agent. In some respects lung diseases due to beryl resemble infections. On the other hand, Grier e (1948) have described granulomata in the skin cuts from broken fluorescent lamps; these granulo contained epithelioid cells and giant cells, and in case beryllium was detected in excised tissue.

SUMMARY AND CONCLUSIONS

A laboratory worker developed a chronic pneumon three years after exposure to a phosphorescent pow (zinc beryllium manganese silicate) used in mak fluorescent lamps. The patient inadvertently exp himself to risk, for it is not generally understood t osed of water, this means that there will be a pondingly greater absorption of energy by the s. The local heat produced in the body by this of energy brings about an increase of venous return a vasodilatation through local reflex mechanisms lirect metabolic effects. The heart-rate may be ased by speeding up the generation and propagation pulses through the sino-auricular node. On the of the experimental tests, the Mayo Clinic have carrying out clinical studies with microwaves for ast year.

NEUROSURGICAL SERVICE

their new organisation by regions, the British tal services form a clear pattern, in which each ent gathers strength from, or gives support to, its bours. Even so, there are still dangerous gaps, ularly in the services which are least often called r most difficult to supply; and perhaps the most le of these is neurosurgery.

e Society of British Neurological Surgeons, like the ty of Thoracic Surgeons,[1] has produced its own n for the future[2]; and this shows how pitifully ent are the present resources. The expansion of surgical work, like that of chest surgery, has been ; and this means that there are neither enough tal beds nor enough trained surgeons. The late brought a great increase in the number of beds side for this specialty; but even now large areas no neurosurgical centre whatever. The report sts that the aim should be to supply for every on people a centre having 50–60 beds (though some that 80–100 are needed). The regions named as ally needy are South Wales, the eastern counties, land. Northern Ireland, and London; and in tion area centres, with some 25 beds each, are osed for the East Midlands, the East Riding of shire, north Lancashire, and the south-west. New res, says the report, should be placed on land shared a teaching, or at least a general, hospital. For se of resources, convalescent beds should, if possible, the same hospital; but, if this advantage can be only by the exclusion of the whole unit from the ral hospital, then it should be foregone. The mittee, insisting that surgical neurology is a proper ject for the undergraduate's clinical training, holds t units of not less than 25 beds should be installed aching hospitals.

onsiderable thought has been given to the training future neurosurgeons. This, in the committee's view, uld be in two stages. The first is that of general ining in which the young graduate spends a year in ior resident appointments, a second year in whole- e study of the basic sciences, and a third as senior se-surgeon or R.S.O. After taking the F.R.C.S. he will, report points out, become a better recruit by doing other year in general surgery. "We say this from the owledge that the best and most telling experience in neral surgery is not usually to be had until this loma has been acquired." The second stage—that special apprenticeship—would take at least a further r and a half years, the trainee spending a year each work as senior house-surgeon in neurosurgery; in urophysiology or an alternative subject (including months in medical neurology); in neurosurgery as egistrar; and finally as a registrar with work outside hospital as a domiciliary consultant.

Not all neurologists, and perhaps not every neuro- geon, will agree with the committee in maintaining t head injuries should necessarily be treated in the gical unit. In the late war the largest Service hospital for medical and surgical neurological cases adopted the practice of admitting all closed head injuries to the medical wards. The virtue of this arrangement was twofold: it saved surgical beds; and from the start of treatment these cases were in the hands of the physicians, whose interests perhaps qualified them better to take charge up to and including convalescence. The occasional intervention by the surgeon—for example, to make a burr-hole—which is cited as a reason for surgical control, was seen as an incident in a disorder which was essentially medical; and, since the committee visualises medical and surgical units working side by side in a single specialised department, there seems to be no practical reason why this view should not prevail in the future. The further contention that few physicians have displayed much interest in head injuries should make neurologists look to their laurels.

WAR RESEARCHES ON THE CORNEA

SOME of the work undertaken for urgent reasons during the war is only now being published. Two monographs appearing within the last few months describe investigations, by teams in the United States and in England, on the mode of action of war gases on the eye.[1] Both reflect the high academic standard of research favoured by the Allied policy of employing civilian scientists to study Service problems. Though largely concerned with the effects of substances unlikely in ordinary circumstances to come in contact with the eye, the thirteen authors have done much to set knowledge of the biochemistry and histopathology of the cornea on a sounder basis. The Americans directed their attention mainly to biochemistry, and the English mostly to cellular reactions; but both groups start with fundamentals applicable to the study of any chemical injury to the cornea. They point out that the action is determined not only by the toxicity of the material, but also by its physical power of penetration. They emphasise the importance of SH groupings in reaction with proteins, and by bringing the problem of injury into the realm of enzyme inhibitions and activations they have advanced ophthalmic pathology far beyond its previous boundaries.

The metabolism of the cornea has been studied in great detail. The functions of its various layers have been separated. Attention has been drawn to such phenomena as the inability of the stroma to take up oxygen or to utilise lactate or pyruvate, the great capabilities of the epithelium, and the existence of a hydrogen transport system from stroma to epithelium. The epithelium-stroma boundary, probably a protein-lipoid multilayer, is the seat of many important activities, and the circumstances in which the epithelium becomes loosened have been carefully examined. Oxygen is essential for this loosening, which does *not* occur anaerobically even after poisoning of enzyme systems with various toxins. The effects of chemical and physical agents (e.g., mustard gas, colchicine, ultraviolet light, and X rays) on the mitosis and on nuclear fragmentation have also been worked out, and so have the effects on the stroma and epithelium of a large number of chemicals not related to war.

The English team, who began work nearly three years before the Americans, gave its attention largely to the clinical appearances of chemical injuries and to the histology of various types of healing. The problem of avascular healing of the corneal stroma and of the epithelium has puzzled ophthalmologists for many decades and the experiments described in the *British* too much detail: it is doubtful, for example, whether the 4 pages illustrating technical apparatus for serum drying are worth their room in a book designed for practising surgeons. The section on the mouth and œsophagus is notable for J. H. Garlock's article on the œsophagus; and the magnificent section on the abdomen, occupying two-thirds of the book, contains chapters by men as well known in England as in America—R. Schindler, A. W. Allen, F. W. Rankin, A. O. Whipple, and others. Perhaps the best chapter in the book is by the late Roscoe Graham on the surgery of the stomach and duodenum: its wisdom, lucidity, and illustrations will commend it as much to the expert in gastric surgery as to the novice.

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[1] See *Lancet*, 1948, i, 801.

[2] Society of British Neurosurgeons, Planning Committee 1945–47: Notes on the Neurosurgical Needs of the Population and the Training of the Neurosurgeon.

[1] Studies on the Physiology, Biochemistry, and Cytopathology of the Cornea in relation to Injury by Mustard Gas and Allied Toxic Agents. *Bull. Johns Hopk. Hosp.* 1948, 82, no. 2. An Experimental and Clinical Study of the Reaction of the Anterior Segment of the Eye to Chemical Injury with special reference to Chemical Warfare Agents. *Brit. J. Ophthal.* monograph, 1948.

Nouvelles techniques des traitement de fractures

H. GODARD: R. MICHEL-BECHET. Paris: Doin. 1948. Pp. 406. Fr. 1500.

THIS book gives a full account of recent Continental methods of fracture treatment, which make use of a variety of ingenious mechanical aids to reduction, and various wires or nails of the Küntscher type. Initial chapters describe animal experiments carried out by the authors, which seem barely to prove that the medullary nail is harmless: but the results they record from their practice seem to justify a freer use of the method than is usual in this country. For any surgeon starting to employ it, this book (if it can be obtained) can be strongly recommended, for the authors describe their techniques for almost every fracture of the body with much detail and clarity. They also give full references to other methods of treatment, and in many cases their preference is for the more conservative methods. Far from being rabidly biased in favour of novelty, the book appears to be an earnest account of the methods which the authors, who obviously have great experience, find to give the most satisfactory results.

Hodgkin's Disease and Allied Disorders

HENRY JACKSON, Jr., M.D., assistant professor of medicine, Harvard Medical School; FREDERIC PARKER, Jr., M.D., associate professor of pathology in the school. New York and London: Oxford University Press. 1947. Pp. 177. 45s.

A SPATE of writings bears witness to the fascination which Hodgkin's disease continues to exert. The most recent addition is this monograph from the Harvard Medical School, in which Professor Jackson and Professor Parker analyse a series of cases. Knowledge of the causation of these diseases has not advanced; their clinical and pathological descriptions make no fresh contribution to the mass of factual data already accumulated, a review of which they do not attempt; and they essay no interpretation and offer no general notions to clarify our ideas. Thus it is to their views on the relations between lymphadenoma and allied disorders that their monograph owes its chief interest.

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too much detail: it is doubtful, for example, whether the 4 pages illustrating technical apparatus for serum drying are worth their room in a book designed for practising surgeons. The section on the mouth and œsophagus is notable for J. H. Garlock's article on the œsophagus; and the magnificent section on the abdomen, occupying two-thirds of the book, contains chapters by men as well known in England as in America—R. Schindler, A. W. Allen, F. W. Rankin, A. O. Whipple, and others. Perhaps the best chapter in the book is by the late Roscoe Graham on the surgery of the stomach and duodenum: its wisdom, lucidity, and illustrations will commend it as much to the expert in gastric surgery as to the novice.

Nouvelles techniques des traitement de fractures

H. GODARD; R. MICHEL-BECHET. Paris: Doin. 1948. Pp. 406. Fr. 1500.

THIS book gives a full account of recent Continental methods of fracture treatment, which make use of a variety of ingenious mechanical aids to reduction, and various wires or nails of the Küntscher type. Initial chapters describe animal experiments carried out by the authors, which seem barely to prove that the medullary nail is harmless: but the results they record from their practice seem to justify a freer use of the method than is usual in this country. For any surgeon starting to employ it, this book (if it can be obtained) can be strongly recommended, for the authors describe their techniques for almost every fracture of the body with much detail and clarity. They also give full references to other methods of treatment, and in many cases their preference is for the more conservative methods. Far from being rabidly biased in favour of novelty, the book appears to be an earnest account of the methods which the authors, who obviously have great experience, find to give the most satisfactory results.

Hodgkin's Disease and Allied Disorders

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ed of water, this means that there will be a
ondingly greater absorption of energy by the
The local heat produced in the body by this
energy brings about an increase of venous return
vasodilatation through local reflex mechanisms
ect metabolic effects. The heart-rate may be
ed by speeding up the generation and propagation
ulses through the sino-auricular node. On the
f the experimental tests, the Mayo Clinic have
rrying out clinical studies with microwaves for
t year.

NEUROSURGICAL SERVICE

heir new organisation by regions, the British
l services form a clear pattern, in which each
t gathers strength from, or gives support to, its
urs. Even so, there are still dangerous gaps,
larly in the services which are least often called
most difficult to supply; and perhaps the most
of these is neurosurgery.

Society of British Neurological Surgeons, like the
of Thoracic Surgeons,[1] has produced its own
for the future[2]; and this shows how pitifully
it are the present resources. The expansion of
rgical work, like that of chest surgery, has been
and this means that there are neither enough
l beds nor enough trained surgeons. The late
ought a great increase in the number of beds
le for this specialty; but even now large areas
no neurosurgical centre whatever. The report
s that the aim should be to supply for every
people a centre having 50–60 beds (though some
hat 80–100 are needed). The regions named as
y needy are South Wales, the eastern counties,
d, Northern Ireland, and London; and in
h area centres, with some 25 beds each, are
ed for the East Midlands, the East Riding of
ire, north Lancashire, and the south-west. 'New
, says the report, should be placed on land shareinic
teaching, or at least a general, hospital. Irious
of resources, convalescent beds should, if possanisers
he same hospital; but, if this advantage ced only
nly by the exclusion of the whole unit frc that the
l hospital, then it should be foregoneatment is
ittee, insisting that surgical neurology is this basic
for the undergraduate's clinical traintork in 1947
units of not less than 25 beds should bn, a medical
hing hospitals. nd a clinical

for medical and surgical neurological cases adopted the practice of admitting all closed head injuries to the medical wards. The virtue of this arrangement was twofold: it saved surgical beds; and from the start of treatment these cases were in the hands of the physicians, whose interests perhaps qualified them better to take charge up to and including convalescence. The occasional intervention by the surgeon—for example, to make a burr-hole—which is cited as a reason for surgical control, was seen as an incident in a disorder which was essentially medical; and, since the committee
visualises medical and surgical units working side bne
side in a single specialised department, there seemsade.
be no practical reason why this view should notsiagrams
in the future. The further contention that few rquested as
have displayed much interest in head inj—e.g. chronic
make neurologists look to their laurels. on—the patient
to be returned to

WAR RESEARCHES ON TH

een eradicated. In
SOME of the work undertaken urine examinations.
during the war is only now bchemical investigations
monographs appearing within ion to the disease process.
describe investigations, by teplasma viscosity, gold floc-
and in England, on the mcine phosphatase are estimated
the eye.[1] Both reflect thy 17-ketosteroids in suspected
research favoured by J. Thus in the first visit to the
civilian scientists to estigation is made.
largely concerned wi visit, for which an appointment is
in ordinary circuesults of the various tests are to hand.
eye, the thirtees finally assessed, and treatment prescribed
ledge of the nbers of the team in consultation. If an
cornea on course of physical therapy is indicated, the
their atte is taken over by the medical officer in charge
mostly ysical medicine, who follows the case through his
fund partment, sending the patient back to the central
in clinic from time to time for review. Special courses
such as chrysotherapy or vaccine therapy, or general medical treatment, are arranged in the same way. From the appropriate specialist the patient receives the treatment prescribed by the arthritis team, and returns for review periodically. Those on chrysotherapy are seen weekly, and routine blood tests are made every three weeks, or more frequently if need be. Urine examinations are carried out weekly before each injection of gold or heavy metal. Patients requiring manipulation, splintage, or acidification of joints (Waugh) are seen by the surgeon and medical officer in charge of physical medicine together, and what may be termed a tactical plan of attack is drawn up.

By this method a period of one week usually elapses between the patient first being seen at the clinic, and the commencement of treatment.

Owing to the shortage of beds and nursing staff, fewer than 1% of the patients passing through the clinic are admitted to hospital; but our experience shows that however desirable it is to have inpatient accommodation, a great deal can be done for a very large proportion of patients attending only as out-patients. In the acute cases which need admission the same routine of preliminary investigation by the team, and planned treatment by the team, is strictly followed.

When the patient has passed through the clinic and received a course of treatment he or she is asked to return periodically for review. Attached to the clinic through the physical-medicine department there is a resettlement officer of the Ministry of Labour. Where a change of employment is indicated, or where return to the original occupation is impossible, the resettlement officer is consulted and an attempt is made to re-employ the patient, or to retrain him so that he can once more be a useful member of the community.

We hope later to publish the findings of this clinic, assessing the value of the various methods of investigation and treatment.

ation. Central abdominal pain associated with a ; of the occlusion type generally means spasm, pain—often milder—in the iliac fossa or at the neans occlusion. Dr. SWYER said that Newman ot been able to confirm Rubin's claim that the re waves in the kymogram derive from the tube, iss MOORE WHITE stated that after removal of t 1 in. of tube on one side, and all but $1^1/_2$ in. e other, she has still seen peristaltic waves in ymogram, which could hardly have originated tubes. Mr. SNAITH would not hesitate to do a 's test on account of transitory inflammation of ervix—except perhaps in the case of gonococcal itis. Dr. JACKSON and Miss MOORE WHITE men- that repeated patency tests must be done before ibes are regarded as occluded; and Dr. Jackson isised that use of the volsellum on the cervix may he tubes into spasm. The cervix should be handled .

Hysterosalpingography

s JOSEPHINE BARNES, F.R.C.S. (London), described osalpingography with water-soluble radio-opaque . Iodised oil, she said, is not absorbed from the or peritoneum; if it becomes inspissated in the it may conceivably cause stricture, while iodised-oil lomata have been known to form in the peritoneum. erg, in a monograph on *Hystero-salpingo-pelvi- ie*, describes the use of diodone injection ('Per- il') which, he claims, injected in dilute solution, es the pelvic organs and makes possible the osis of ovarian tumours and some other lesions. Barnes uses a watery solution of diodone. A viscous on has been tried but caused severe pain. The of viscosity is not a serious drawback, however, the watery solution does not cause spasm. An ntaneous radiogram is taken at the very moment the fluid is injected, and 20 minutes later another ken off the whole abdomen. The first shows the taken up rapidly into the tubes, and demonstrates lockage; the other shows excretion of dye already ining in the kidneys. The whole procedure is lete in about half an hour.

. ERNST FRIEDMANN (London) said that he had used cyazol' in nearly 50 cases without ill effects or plaint from patients. This preparation, which is diodone, will shortly be on the market in this itry.

Sims Test and Male Infertility

iss GERTRUDE DEARNLEY, F.R.C.O.G., reviewed briefly development of the subfertility clinic at the Royal Hospital, London. It was begun in her department Miss Moore White in 1937, and now carries seven tors and a part-time registrar.

r. MARY BARTON (London) said that she chose to the Sims test in the late follicular or ovulatory phase. ing mucus from the upper as well as the lower portion the cervical canal. The normal picture 24 hours r intercourse is of mucus densely invaded by spermat- a, many showing rapid movement. This picture out serious oligozoospermia and asthenozoospermia, not some other forms of male infecundity. The ical mucus allows only strong and well-differentiated matozoa to pass—apart from a few lively forms, microsperm. She noted that the head of the matozoon changes, when it enters the mucus, from ulate to olive-shape. A positive Sims test may k pyospermia, since polymorphs in the semen do penetrate the mucus; nor does the test reveal liative conditions of the testis. A couple may give ated positive Sims tests without conception taking e, even when no other recognisable infertility factors present, yet conception may occur after a focus sing pyospermia has been eliminated. For this and other reasons the Sims test should be supplemented by semen analysis. Spermatozoa may be found in the fornix in reasonable quantities when none are found in the cervical mucus; this does not imply male infecundity, however, since the mucus may be specially resistant to invasion. This finding should therefore always be followed by a cross-invasion test, the husband's semen being tested against the cervical mucus of another woman, and the wife's mucus against the sperm of another man. Sometimes the spermatozoa invade the test mucus, and conversely the wife's mucus may admit the strange spermatozoa. Such incompatibility is not necessarily permanent. In other cases, though the husband's spermatozoa invade the wife's mucus they quickly become immotile. Cervical mucus contains reducing substances which may be used to nourish the spermatozoa; and possibly the supply may be insufficient to meet the needs of a dense invasion. The Sims test may also reveal a curious condition in which no spermatozoa at all are found in the cervix or vagina, even though the semen obtained by masturbation is rich in them, and can be used successfully for artificial insemination.

Testicular Biopsies

Dr. FRIEDMANN discussed the technique of testicular biopsy. He takes the specimen with the patient under gas, and uses the type of instrument designed for liver biopsy. The specimens give valuable information about the state of the seminiferous tubules, and repeated biopsies can be used to check progress under treatment.

Testosterone Implants

Miss MOORE WHITE reported on the results of a series of testosterone implants made by Mr. George Qvist at the Royal Free Hospital. He implanted 200 mg. of testosterone, and in a few cases the semen showed improvement, but results on the whole were not encouraging. In one couple who did not report back the wife conceived and miscarried; no others conceived. Biopsies might have shown that some of these cases were unsuitable for implants, and in future it is hoped to do biopsies as a routine.

Vitamin E

Mr. NORMAN WARREN (London) had given vitamin E to 50 cases of oligospermia in doses of 30 mg. twice daily; semen analyses were done beforehand. There was an increase of density of spermatozoa in 23 cases, in 18 an improvement in motility and viability, and in 17 an increase in volume of semen of more than 0·5 ml.; and a lower percentage of abnormal forms was found in all cases where there was improvement in any of the other three factors. He concluded that this group showed some response to vitamin-E therapy.

Dr. H. A. DAVIDSON had treated 42 subfertile patients over twelve weeks with 'Ephynal' tablets, 10–14 mg. daily; 12 received methyl testosterone in addition. In 29 cases there were normal variations only; 6 showed some improvement, and 7 some deterioration. Two pregnancies were reported, one of which ended in abortion. Comparable results, he said, could have been found in a similar group receiving no treatment. Lest synthetic vitamin E is less effective than the natural product he proposes to treat a similar group on wheat-germ oil.

Dr. JACKSON had treated 50 subfertile men over periods ranging from three weeks to two years with 'Fertilol,' 'Viteolin,' or ephynal capsules in dosage roughly comparable to that of Dr. Davidson. Half of them received some other treatment as well. Some had large numbers of specimens examined and 35 had at least three such examinations; so it should have been possible to demonstrate any improvement. There was little evidence that vitamin E had any effect, good or bad, and most of the variations could be matched among men who had received no treatment. Of the wives,

INFERTILITY

FAMILY PLANNING ASSOCIATION'S CONFERENCE

A conference on infertility, arranged by the Family Planning Association, was held at Exeter on Sept. 25 and 26.

Congenital Absence of the Vas

Mr. DONALD H. YOUNG, F.R.C.S.E. (Liverpool), described cases of congenital absence of the vas deferens. In the first he had seen, the semen was found to contain no spermatozoa, though biopsy of the testicle showed that spermatogenesis was normal. At cystoscopy, the bladder and ureteric orifices appeared normal, but no ejaculatory ducts were visible; and at operation the vasa deferentia were found to be represented by thin fibrous cords. Fructose is normally present in semen, and is formed in the seminal vesicles; its absence implies disease of the vesicles or absence of the vas. Up to 1940 some 30 cases were noted in Germany among patients undergoing compulsory sterilisation under the Nazis; these amounted to 0·5% of the total number sterilised. A few cases have been reported in the United States since 1945. Cases of obstruction of the ejaculatory ducts give the same seminal findings but can be distinguished by the fact that the vas is palpable.

Similar cases were described by Dr. G. L. FOSS (Bristol), Dr. H. A. DAVIDSON (London), and Mr. LINTON SNAITH, F.R.C.S. (Newcastle); and by Dr. T. MANN, (Cambridge), who added that human semen contains, besides fructose, something under 1% of citric acid. This derives, in man, from the prostate, and might, he suggested, be used as a measure of prostatic secretion. Mrs. CLARE HARVEY, who has been doing fructose estimations in semen since last February, said that in five or six specimens showing azoospermia which she examined fructose was present, whereas the only specimens without fructose showed normal sperm counts. Dr. MANN pointed out that if an occlusion is above the seminal vesicles fructose will be present in the semen: *moreover human semen is not of a constant* chemical composition; it varies, in the same subject, from specimen to specimen.

Supravital Staining

Miss ANITA MANDL described a method of supravital staining with buffered soluble blue, by which living spermatozoa are stained pink, and dead ones bluish-purple. Motility, she said, is not necessarily a measure of viability. Mrs. HARVEY said she has used the method, with semen incubated at 37°C. Though all motility ceased after 24 hours it was 4–5 days before all the spermatozoa took on the blue stain, though the proportion of blue-staining spermatozoa increased steadily during the period of incubation. Dr. MANN pointed out that motionless spermatozoa are not necessarily dead, and may revert to motility; and Dr. G. I. M. SWYER (London) summed up the action of the stain as differentiating the irreversibly immotile spermatozoa from those which are motile and reversibly immotile.

Mr. A. WALTON, D.SC. (Cambridge), noted that the motility centre is in the middle-piece and tail; the head takes no part in it. Dr. SWYER said that the different parts of the spermatozoa take up the stain differently, the tail dying first and taking the blue stain while the head is still pink. "They die from the tail upwards."

Blood-supply of the Testis

Dr. R. G. HARRISON (Oxford) described the blood-supply to the testis in various animals, and showed a number of beautiful X-ray photographs of animal testicular vessels injected with colloidal bismuth. In most of those examined the testicular artery was a single vessel which formed a number of convolutions before reaching the testis. The wallaby, man, pilot whale offer exceptions to this usual arra In the wallaby the artery, instead of convoluting, into a sheaf of small vessels which later unite vessel supplying the testis; and the veins pampiniform plexus which collects up into four In the pilot whale there are no convolutions splitting—the artery plunging straight into the before it breaks up. In man the artery runs straight, giving off branches to the cord and epi and then divides into two branches, one to the and one to the posterior border, which ramify o surface of the testis, sending in, towards the medi branches which loop back on themselves. It d as the textbooks say, run directly into the medi and this is important since in the treatment of c chidism one of the main branches may get ca There is some relation between arterial coiling fall in temperature between abdomen and test the ram the veins surround the artery, sugg arrangement for the exchange of heat. A rise perature affects fertility: when the testicles are to the abdomen in animals they become ste the continuous application of heat to the t injurious to fertility. Short hot baths are harmless, but evidence is needed about the e repeated hot baths, of warm underclothing, and occupations as stoking.

Mr. YOUNG asked whether varicocele, which to be associated with subfertility, raises the t temperature; and other speakers discussed the of elastic suspensory belts often worn by *especially footballers.* Dr. MARGARET HADLEY J (Exeter) remarked on the large number of fo among husbands of women attending the Exet fertility clinic; and Dr. R. G. CROSS (Dublin) that the British are supposed to be sterilising the by hot-bathing, and the Americans by wearing tight pants. It is time, he said, that we pa attention to the kilted races.

Mr. SNAITH said that there is no evide correlation between varicocele and subfertili patients believe that there is, and they need re Dr. WALTON mentioned that the largest varicoce ever seen was in a very fertile ram. Dr. W. J. noted that the chemical output of the gonads is by temperature: if they are transplanted to *the output of hormones is increased.*

Uterotubal Insufflations

A paper by Mr. ALBERT SHARMAN, M.R.C.O.G. (was read in his absence by Miss M. MOORE F.R.C.S. (London). He reminded the meeting importance of using carbon dioxide rather tha *oxygen for the Rubin insufflation test,* and s he has not encountered any ill effects from using a of 250 mm. Hg as a routine. Tubal spasm is a cause of negative findings, and he has found t 32% of cases showing non-patency in a single t occluded tubes. If, after a negative result, th is dilated and a second insufflation is done, th may be resolved. Insufflation, or even dilatatio may be followed by *pregnancy, and this* i attributed by Rubin to the establishment of removal of the cervical mucous plug, or dilatatio tubes, or possibly to a psychic effect. Mr. S believes that the addition of a kymograph insufflation apparatus makes it possible to di between tubes which are normally patent an which are the site of spasm, stenosis, or adhesion the tube.

Dr. JACKSON said that it is often possible to tiate spasm from stenosis by the type of pain not to the radiographic appearance of silicosis the degree of emphysema present.

V. C. DREESSEN (U.S.A.) surveyed the develop- nd trends of studies of pneumoconiosis in the States during the past decade. Physiological h and clinical investigations have opened up many lds; but further basic studies are needed, since it ming apparent that other air-borne particulate ls besides silica and asbestos are causing serious ary disease.

eat paper by Dr. A. J. VORWALD (U.S.A.) on aceous earth pneumoconiosis was memorable if ecause it showed how an investigation should be

maceous earth is a fine-grained material composed siliceous residue of diatoms and other microscopic that live in water. Clinical and experimental evidence at both crude and fluxed calcined diatomaceous earth able of producing pulmonary fibrosis, the latter more he former. Though there are scattered foci of sation and necrosis, not unlike the pulmonary response ded quartz, the fibrosis is more diffuse and cellular in d involves more especially the alveolar walls in addition periarterial and peribronchial tissue. The alveolar are either obliterated, greatly distorted and small, or d to form emphysematous areas. The diffuse cellular ary fibrosis is more serious than the discrete nodular of uncomplicated silicosis, and is perhaps responsible pronounced shortness of breath seen in this disease. sed calcined product, which contains more cristobalite of free silica) than the crude material, has a deleterious n any associated tuberculous infection. Dr. Vorwald that he has not yet finally identified the specific nent of diatomaceous earth responsible for the observed l and experimental effects.

A. BRUUSGAARD and Dr. K. B. SKJELBRED- SEN (Norway) described cases of silicatosis in a mill, and Dr. F. BARTÁK and Dr. M. TOMEČKA hoslovakia) showed that a pneumoconiosis, which called stannosis, can develop after inhalation of the of tin oxide. They did not, however, make it very whether they regard the dust of tin oxide as noxious ert, though they did point out its radio-opaque ties. They also drew attention to the "euphoric of those even gravely affected"—presumably those ing conspicuous X-ray changes—and mentioned acrophagic but no other type of reaction in the lung e. (All of which suggests that the dust of tin oxide t very harmful and that "stannosis" can be classed e of the benign pneumoconioses, of which siderosis e best-known example.)

e physiological aspects were discussed by, among rs, Dr. TORSTEN BRUCE (Sweden) who dealt with cise-tolerance tests and spirometry. He stressed fact that the dyspnœa of silicosis has a physiological ground and that the lungs have several mechanisms reby they can adapt themselves to the strain pro- d by the destruction of air cells. In addition to nical stimuli he mentioned the significance of the ous regulation of both ordinary and the forced thing in silicosis. Dr. P. PELNAR (Czechoslovakia) ribed a new method of examining respiratory and ulatory functions with special reference to silicosis. method consists in continuous measuring of the gen and carbon-dioxide equivalents at rest, during cise, and during recovery from exercise. In silicosis finds that his results do not correlate well with X-ray findings, but there is a correlation with the e of dyspnœa and the degree of incapacity.

Science reporting and interpretation does not accomplish urpose . . . if it does not bring about an appreciation and ilization of the method of science in everyday life. . . . e great mass of the people, through accurate and interest- accounts of the successes and failures of science, can pse and understand that essence of science, its trying, ng, and trying again, if they build their own convictions this is a good, sensible, successful, and useful method, there is hope that they will apply it more widely to yday life, to our human relations, to running our busi- es, to our governments, to everything that we do."— rson DAVIS, *Science*, Sept. 3, 1948, p. 241.

THE NEW ZEALAND HEALTH SERVICE

FROM OUR CORRESPONDENT

THE report of the Medical Services Committee has been tabled in the House, and discussed in the press, but not so far by profession or parliament. The committee was composed of four members from the British Medical Association, and three (two medical) from the health department, with a legal chairman. Its object was to advise the government about the present medical scheme, which has been seven years in operation, and to suggest ways and means of overcoming admitted abuses. It thus represents the first major effort to overhaul the system; but it does not deal with many large aspects such as hospital reform, nursing, medical education, and the health department.

Administration.—Committees for continuous advice in policy, discipline, and ethics are proposed for the first time, the onus to be placed largely on the medical men.

General-practitioner Services.—The present fee-for-service scheme is to be retained, a number of minor adjustments and simplifications being recommended. The report debates capitation, salaries, and combinations of these, but for various reasons finds them unacceptable.

Specialist Services.—These represent the only major gap remaining in the New Zealand scheme. The report proposes a fee-for-service system, an extension of "open" (part-time) hospital appointments to help to attain the greater number of specialists alleged to be required, and the construction of a roll of acknowledged specialists based on higher qualifications, experience, &c. Many details are left for negotiation.

Pharmaceutical Benefits.—Reasons for soaring costs are examined, and the imposition of a partial payment on the patient is proposed.

It will be interesting to observe the reception given to these proposals by parliament and profession, and what, if anything, will be done. The difficulty of such piecemeal repair work is obvious to anyone who takes a broad view of the whole system of health services. There never has been any attempt to synthesise and coördinate plans for the whole; and until this is done, essentially to the satisfaction of the parties concerned, there is little prospect of progress.

MEDICAL DEFENCE UNION

AT the annual general meeting, held in London on Tuesday, Mr. St. J. D. Buxton, the president, recalled that last December the union decided to admit dental practitioners to membership and to provide advice, indemnification, and protection for practitioners overseas. He warned members to consult the secretary as soon as they find themselves in any medicolegal difficulty, for successful defence is often prejudiced by action taken before seeking advice. During the year, he said, the union had conducted nearly 1600 cases, a rise of 14% on 1946. Previously the highest annual figure for indemnity and law expenses was about £21,000; but "this year we have already committed ourselves to a sum in excess of £40,000 and there remain more cases to be settled or fought in the courts." Of the annual subscription, still at £1, over 13*s*. went in law charges and indemnity claims.

The annual report shows that, with 32,075 members on July 20, 1948, the deficit was £1344 on last year's working. One case cost it £15,791, the member having paid £10 in subscriptions. The total funds available, inclusive of the guarantee fund, amount to £189,736.

Referring to the 49 cases of alleged negligence dealt with, the report discusses the trend of judicial opinion and says that it is becoming easier for claimants to succeed in any class of action arising out of insurable risks—e.g., traffic and workmen's compensation cases. "Therefore, the tipping of the scales in favour of plaintiffs in cases in which the union is involved is only part of a larger whole." Though the doctrine of *res ipsa loquitur* has not yet been wholly applied to a case involving medical negligence, some recent cases have come close to casting on the defendant the burden of proof that negligence was absent. Certainly, the courts have felt justified in accepting as proof of negligence evidence which would not have satisfied them before the war. Probably (the report suggests) this leniency is only temporary, and judges may presently recognise that the pendulum has swung too far.

14 (28%) conceived, which does not compare favourably with 33% of conceptions among 324 wives attending the clinic during the same two years. She concluded that though there is little evidence that spermatogenesis can be improved by vitamin E, it is possible this vitamin may prevent further degeneration in an already damaged testis.

Basal Temperature Charts

Dr. JACKSON said that the morning rectal temperature chart helps the doctor to sort out irregular cycles, to prognosticate the day of menstruation, and to diagnose pregnancy, sometimes in advance of a report on the Aschheim-Zondek test. Persistence of the high "luteal" temperature beyond fourteen days strongly suggests pregnancy. In 2 cases she has been misled: both patients were obsessionally anxious for a child and induced a state of phantom pregnancy. Their periods were inhibited for some months; their rectal temperatures were raised, and they insisted on remaining in bed for weeks. The temperature did not fall until they were made to get up and go about their business. Such cases, however, are rare.

Impotence and Fertility

In the general discussion on the foregoing group of papers, Dr. DOROTHY TAYLOR asked for advice on the treatment of partial impotence. Miss MOORE WHITE said that successful artificial insemination of the wife with the husband's semen often resulted in the husband's recovery from impotence. Dr. DAVIDSON mentioned a syringe which he and Dr. Joan Malleson had devised for taking up the semen from nocturnal emissions, for the artificial insemination of the wife; the number of emissions can be increased by giving testosterone. Dr. JACKSON had found one husband who recovered on being directed to do so by the doctor, while Dr. JOHN HOLT (Holland) finds a successful method is to forbid the husband to have intercourse with his wife.

Dr. A. C. CROOKE (Cambridge) said that one group of steroids, which includes testosterone, is androgenic, while another group is spermatogenic. He has had promising results in 3 out of 4 cases treated with androstenediol dipropionate, which he synthesises himself.

Miscarriage Related to Seminal Characteristics

Mrs. HARVEY discussed the relation of seminal characteristics, especially oligospermia and high numbers of abnormal spermatozoa, to abnormal development of the fœtus resulting in miscarriage or stillbirth. Her figures refer to a group of over 700 husbands attending the Exeter subfertility clinic who were responsible for 745 conceptions ending as follows: 409 live births with 15 neonatal deaths, 261 spontaneous miscarriages, 24 stillbirths, 5 ectopic pregnancies, 2 induced abortions, 27 pregnancies still in progress, and 17 doubtful early conceptions. Moreover, 371 wives have had no known conceptions. She showed that the number of spermatozoa, and their motility and morphology, but not their viability, are correlated with the chance of conception. There is little evidence that any single factor in semen conduces to miscarriage or stillbirth; but the miscarriage-rate, contrary to expectation, is highest among the wives of men in the 3A group [1]; which implies that the maximum chance of miscarriage is associated with a density of 40–59 million sperm per ml., and falls off on either side of this range.

Assessment of Infertility Data

Dr. SWYER gave a survey of papers on infertility published in four American and two British journals in 1946–47 to show how exceedingly inaccurate, and even unscrupulous, authors sometimes are in the presentation of their papers. In the subsequent discussion editors were criticised for publishing such misleading work.

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[1] Harvey, C., Jackson, M. H. *Lancet*, 1945, ii, 99, 134.

PNEUMOCONIOSIS

SOME FURTHER COMMUNICATIONS

AT the International Congress on Industrial which we reported briefly last week, four whole were devoted to pneumoconiosis, and these separate notice.

A paper by Dr. J. DANTIN-GALLEGO (Spain), New Ideas on the Ætiology and Pathogenesis of. was based on the premise that until recent times has not been studied scientifically and that nc yet considered the effect of the environment development of the disease. He thinks that too attention has been paid to the chemical effect of and that the radiographic appearances have correlated with the pathological anatomy. For part he assigns great importance to the constitution and physical properties of inh particles on the one hand and the human the other.

Prof. JETHRO GOUGH and Dr. J. E. W presented a new technique for cutting thin the whole lung and mounting them on paper, which constitutes a distinct advance in the lung lesions. The focal emphysema of coal trimmers is shown with great clarity, and the logical features can be correlated with the rad appearances.

Dr. A. BRUUSGAARD (Norway) described some of pneumoconiosis in workers exposed to silicon dust, which has been thought to have little effect lung tissues. Of 32 workers in a carborundum 10 showed radiographic lung changes, some of nodular in character. In the more advanced was slight disability. Most of the affected worked in a dusty atmosphere for more than fift (In the absence of pathological evidence it is not to be certain about the cause of the X-ray some might be due to deposits of carbon fibrous changes might account for the incapac in some cases.)

Pneumoconiosis in coalminers was the subj number of papers. Prof. E. J. KING with HARRISON and Dr. S. C. RAY dealt with the aspect, while Dr. I. DAVIES and Dr. K. J. MA a classification of coalminers' pneumoconiosis X-ray appearances. In the South Wales area X-ray abnormality consists of minute c 1·5 mm. in diameter, circular in outline and density. These may remain discrete or ag form larger granular opacities. Two stages of coniosis, simple and complicated, are recognised. stage is subdivided into categories, three in the type and four in the complicated.

Progression of the X-ray shadows in c described by Dr. C. M. FLETCHER. Two groups studied: in one the men had had no further coal dust after the first radiograph, and in the they had continued to work in the mines. In the no increase in the characteristic generalised of simple pneumoconiosis was seen, whereas in the the opacities increased in number rather than In both groups, however, a majority had de localised coalescent or massive shadows associated a raised erythrocyte-sedimentation rate at the examination. It is concluded that this type of pro is not dependent on continued exposure to coal du to an additional factor which may be infectio tuberculosis.

Prof. J. LECLERCQ, with Dr. E. BAIG Dr. BONTÉ, and Dr. G. DECLERCQ (France) demo the value of tomography in localising the masses pseudotumoral form of silicosis, and Dr. G. C. E. (Netherlands) discussed the efficiency of mass min radiography in the detection of reticulation and tion. A practical trial with patients suffering fro earliest stages of granulation proved that, when with large films, the 40 mm. miniature films re the changes well. Studies of the electrocardiogr silicosis by Dr. F. LAVENNE (France) showed the most important changes were those usually asso with right ventricular hypertrophy and that they

Letters to the Editor

ENTAL INTRA-ARTERIAL INJECTION OF DRUGS

—May I make some comments on Mr. Sol. Cohen's of Sept. 4 and 11 ? begins with the assumption that the phenomena scribes are due to intra-arterial injections, which vascular damage and thromboses, but he does not that all the injections actually occurred by this In a high proportion of cases no evidence of rterial injection could be found at operation. ct that arterial thromboses developed in some of is no proof that the drug was injected into an . Indeed, there is much evidence that Mr. Cohen's ptions are unjustified :

ccording to several authors he quotes, thiopentone en injected into arteries without pain or other ill effects.

ith thiopentone the symptoms began with local or peri- pain immediately on beginning the injection ; but bi take time to form.

n some of the cases there were no changes in blood- re, and no clinical signs of arterial or venous obstruction, t operation thromboses were not found in the blood- s (e.g., case 7). In fact, the radial pulse may be full, case 3. The same is true of the case of gangrene ing 'Myanesin' injection which he mentions.

n his own showing, the initial symptoms in the thio- ne mishaps are completely relieved by sympathetic block, which indicates that they cannot be due to sible pathological changes in the blood-vessels, such as boses.

n the thiopentone cases, the pain which comes on iately after injection may be followed by vasodilatation e side, or in the whole of the hand and forearm, or by te hand and cyanosed fingers. These are the signs of ve arteriolar vasoconstriction. The vascular and other es were relieved by sympathetic block, indicating that originated in changes in the activity of vasomotor nerves. patient later developed Raynaud's phenomena, which result from purely neurological lesions, such as gomyelia. Two patients developed severe generalised otor reactions and poor pulse in the opposite limb. e are the effects of alterations in the activity in motor nerves.

In the affected limb, in addition to the pain, there later ar muscle spasm and sensory disturbances, such as ng, a sensation like a tight band round the limb or that rm is being broken, vascular changes, œdema, blisters, punctured sloughing sores. In case 1 the hand and rm were completely anæsthetic and the hand tingled. se 3 the entire hand and ulnar aspect of the forearm were sthetic, and extension, pronation, and supination move- ts were impossible. In case 5 there was complete loss oluntary movement of the wrists and fingers, but passive ements were possible and painless: case 8 showed ove " anæsthesia. In cases 4 and 8 anæsthesia and phy of the intrinsic muscles of the hand appeared, and two cases carpopedal spasm. All these symptoms are iliar to neurologists and are identical with those resulting n irritation of peripheral nerves—e.g., in brachial neuritis causalgia—and with the initial effects of injection of octocaine ' into a nerve.

n Schmuttermayer's case quinine was injected into the er arm producing the signs of a radial nerve palsy ; but Cohen states that this also caused symptoms suggestive ntra-arterial injections.

ll these facts suggest that the author is confounding effects of intraneural and intra-arterial injection. t the effect of thiopentone is primarily on the nerve s and fibres is also shown by its very use as an sthetic and by the following case under my care :

miner, aged 42, had a thiopentone injection into left arm for a hernia operation. During the injection had some pain in the upper arm and shoulder, and r this he developed pains in the whole limb, with e tingling, and the signs of a brachial neuritis, lting in marked weakness and wasting of the deltoid, ati, rhomboids, and upper-arm muscles, winging of the scapula, and weakness of the trapezius muscle causing the shoulder to drop on this side. A glove anæsthesia was present, but the pulse-pressure and blood-pressure were normal and equal on the two sides of the body and the symptoms gradually improved. It is difficult to explain such a case as due to arterial damage.

As Mr. Cohen says, intra-arterial injections are often painless unless the artery is covered with a network of sensory nerves. This suggests that sudden severe local pain following injection of drugs is due to their injection into the sensory nerves around the vessels or into the main nerve trunks. (The former probably occurred in case 1, in which blood was found around and in the adventitia of an artery.) Injections into nerves may produce marked peripheral vasodilatation, through liberation in the blood-vessels of acetylcholine from the vasodilator fibres in the nerves. Acetylcholine has been shown to accelerate blood-clotting, and excessive vasodilator nerve impulses may therefore eventually precipitate thromboses. It is unnecessary to imagine that thromboses in the arteries supplying the nerves of the limb are responsible for the neurological symptoms. It is much more reasonable to suppose that the arterial thromboses follow the neurological lesion.

The arterial thromboses which later occurred in some of the cases Mr. Cohen describes were no doubt important in causing the onset of gangrene. Nevertheless gangrene may occur as a trophic lesion, resulting from damage to nerve-fibres (as in tabes, leprosy, and bed-sores), without vascular lesions being present.

London, W.1. R. WYBURN-MASON.

DIETARY FAT

SIR,—Your leading article of Sept. 18 gives a fair account of our present knowledge of dietary fat. You will perhaps allow me to comment on it and on Dr. Walker's letter on p. 476 of the same issue.

Most of us will agree with Dr. Walker that it is unwarranted to define the deficiency symptoms of a nutrient, the minimum requirement of which is not yet known. However, the comparisons of our rations with the fat intake of other countries are not accurately quoted. Thus he states, on the authority of Fleisch,[1] that the daily fat intake in Switzerland during the war period was 40–50 g. A glance at the curves on p. 891 of Fleisch's paper shows that these figures held good only for the period from the end of the first quarter of 1944 until the end of the second quarter of 1945. Six months later the fat consumption went up by 50–60%. Even this summer, 3 years later, visitors could see that the Swiss public was still as eager a consumer of butter and whipped cream as the holidaymaker from Britain. It is perhaps fair to add that food rationing was introduced in Switzerland in 1942 and that light, moderate, and heavy workers obtained 600, 1200, and 1800 extra calories daily, consisting mainly of meat, cheese, and fats.

Your leading article enumerates the probable reasons underlying a craving for fat. Experience indicates that fat consumption depends more on living standards and national food habits than on geography, climate, or race. The average daily fat consumption in England rose from 99 g. per head in 1909–13 to 124 g. in 1934.[2] Similar rises occurred in other western industrial countries and also in the United States; and the fitness of the South African Bantu or of the Japanese, with a daily fat intake of 30 g. or less, will be of little help in establishing our minimum requirement.

In dealing with this problem the importance of the non-caloric functions of dietary fat have not always been sufficiently recognised. In a properly balanced diet[3] not only is the absorption of fat-soluble vitamins and of calcium and phosphorus dependent on adequate fat intake, but the fat also exerts a sparing action on many of the B vitamins. Another important relation of dietary fat to the economy of food utilisation was recently demonstrated in animals.[4] A mixed diet containing an adequate amount of fat secured extra calories for work, growth, and

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1. Fleisch, A. *Schweiz. med. Wschr.* 1946, p. 889.
2. Brandt, K. *Ann. Amer. Acad. Polit. Soc.* 1943, 225, 210.
3. Leitner, Z. A. *Med. Pr.* 1948, 219, 215.
4. Forbes, E. B., Swift, R. W., Elliott, R. F., James, W. H. *J. Nutrit.* 1946, 31, 203.

In England Now

A Running Commentary by Peripatetic Correspondents

A FRIGHTENED young man of six met me in the duty room that night. I was told he had swallowed some berries, so for once having thoroughly read my journals, I seized a tube and washed him out. That sounds easy, but I have had difficulty in penning this, for my index finger has still not recovered from the bite he gave me. By now he had fixed dilated pupils. *Atropa belladonna, thought I, until I saw green berries.* I called a colleague. Of course, when he got there the boy's eyes were normal, his adrenalous fear having passed.

By this time the boy had recovered from his treatment, and (I feel with malice) stated that his playmate had eaten more than he had. But we were loth to wash out more stomachs until we knew what the berries were. So two porters and I, very shady-looking characters all, trailed the boy's parents through hosts of doctors, all of the same name and all very sleepy, and finally got a description of the berry-bearing area. Armed with a torch, and keeping a wary lookout for the copper on his beat, I scaled the fence of the park, and crept like a felon through scrub and semi-desert until I found a good strong growth of berried weed in the place described. Tearing off a large portion of bush, I returned to the hospital. There, with the aid of the *Lancet* for Sept. 11 and one forlorn berry on a large mass of vegetation, we identified *Solanum dulcamara*, or Woody Nightshade.

While the radio blared "Woody Woodpecker," we waited for the boy's pal, a wee thing of 4, to get to the hospital. As soon as she arrived I again passed the tube. It blocked. So my colleague, asking her to open her mouth, tickled her tonsils with a spoon. She vomited. He told her it was not enough. So she obligingly vomited again. He then said "Open wide," and made her sick again. A much better method, thought I, massaging my finger.

My colleague now rang up a toxicologist of repute to ask him for an antidote. "An antidote?" quoth he. "What a question to ask me. I only know what killed *'em, not why they got better." A pleasant outlook . . .*

As the nursing staff had only kept the non-berry-bearing residue, I finished the evening's entertainment by sorting through the whole dirty linen of the ward for *twelve hours (3 incontinents!), to find at last a berry* from the boy's stomach. If this proves anything, it is my pet theory that children love to be made sick. What else can swings, roundabouts, and synthetic sweets do to make them *feel and look so happy?*

Please, dear *Lancet*, continue to publish accounts of rarities just a week before I need them.

* * *

In the present emergency, a number of practitioners have approached me for notes on the plastic surgery of the cigarette, and these I now give (I'm sure the Medical Research Council won't mind).

Dislocation, due to sale without the usual container, is readily reduced by running through the fingers several times.

Fracture is invariably compound, and occasionally comminuted. Neither plaster nor Unna's paste should be used as occlusive dressings. Collodion is all right if you don't mind the smell of shoeing horses. The treatment of election is recapsulation by the method described under plastic reconstruction (below).

Herniation of the contents at both ends is incurable, though in early cases I always put it back with an eye spud.

Plastic reconstruction by the Wandsworth-Dartmoor technique is rapidly gaining popularity *even in Harley Street*; the opportunities for it, in general practice, can be supplemented by putting out more ashtrays in the waiting-room and looking underneath the grate in the rooms to which patients have access. *Messrs. Fiddle and Flog of New Ravenish St.* will shortly advertise a portable steriliser for the squeamish, and the operation should then become a routine procedure throughout the profession. In its simplest form, it is undertaken by *selecting* a suitable former, of a diameter slightly greater than that of your own or your patient's favourite brand. Old metal catheters matched to the size of a Weight, a Player, and a Churchman's No. 1 make a suitable *armamentarium*, or a convenient set may be turned up from aluminium rod. A suitable c rolled on this, the length of the implants is carefully to provide a clean surface at each end, and the f withdrawn in stages, being replaced by the implants, are slightly reduced in diameter by rolling between and thumb. This operation may with practice be c in the privacy of the pocket. A single strand of fine wire passed longitudinally *down the middle* of the article protects the operator's clothes from any po hazard during consumption.

Exsanguination-transfusion, with dilution of the *rarely meets with success, practical* or social. Some who must have impaired powers of olfaction, reco a diluent:

℞ Tussilag. fol. exsicc.
Rubi fol.
Lavand. flor.
Trifolii flor. aa part. aeq.
M. Trit. secundum artem.

I don't use any of these techniques myself. I saved all fifteen of my tobacconist's kids from of external auditory meatitis—I should worry.

* * *

I *must* warn my *fellow peripatetic* who wrote heartedly about patterned American neckties that least one city of the United States (Omaha, to be he is probably a marked man. He certainly has the feelings of the mayor of that ancient and de city. According to the *New Yorker* his Honour ruling passion and that is neckties. He has h carried unique distinction as a tie-fancier. started collecting them at the age of 18, by Fe of this year he had collected some 1000 ties. number has no doubt increased since then, for w he or his scouts see a new pattern he does not until he owns it. All he asks is that it shall be ciently colourful and capable of filling up the bosom. He has paid as much as 35 dollars exclusive design. How exclusive they can be judged from the fact that one tie carries a po his Honour himself while another features a hand-picture of a lady ice-skating star. The most ex however, must be one made of the skin of an calf presented to him by a Texan cowboy. He l made of doe-skin and several of leather; tho might be expected, the bulk are of silk.

All this is set down to impress on my fellow spondent that he must keep *away* from Omaha. of course, he goes in his yellow waistcoat and some very special gift to propitiate the mayor— from one of Picasso's pictures; or (perhaps ch a nice logarithmic phonocardiogram in glorious Techn

* * *

I recently acquired a practice; so the local ance committee, as was the custom, circulated a to all the panel patients informing them of the c of doctor. However, owing no doubt to recent events, the insurance records are not always up to as the following letter shows.

Dear Dr.—The person on the form sent in was father, and he died April, 1940, so I don't think *needs any attention from anybody.*—Yours truly, Mrs. —

* * *

Nearly three months has passed since the fate day and the world goes on. Patients recover, patie *die, babies are born, and we are still here.* To be Mrs. Jones has cast aside great-aunt Mary's old gl and is the proud possessor of a pair of her own "m to measure," and Mrs. Smith, who has found her moth *discarded dentures are all very well for* weddi funerals, and such like festivities, though of course for eating, is beginning to have doubts about whet naked gums are the best implements for tackling *post-war food, now that you can get new* teeth "on the panel." But apart from a decided increase my ink expenditure there is little change. The roari torrent of E.C.40 has changed to a modest trickle an up to now life isn't so bad. I've given up scanning th advertisements for a new line in belts: "small size wi extra notches, allowing for further reduction, especiall designed for the medical profession." Perhaps th won't be necessary after all.

nsfusion, though a previous attempt at transfusion "needle technique" had failed because of this. heless, it is felt that a light splint might be used dvantage in the case of a restless or sleeping

ing has never been observed, despite the fact ie introducing needle is much larger than the r. No case has shown any bruising. No phlebitis urred so far, and in one case the same vein was iently employed for transfusion by "needle ue."

ks are due to the medical and nursing staff of the in which these transfusions have been performed. catheters extruded to our specification were supplied La Rue Insulation Ltd., of Tynemouth, who have been most helpful.

Victoria Infirmary, WILLIAM WALKER.
wcastle-on-Tyne.

NTANEOUS RUPTURE OF THE RECTUM

—I was interested to see the recent reports of d "spontaneous ruptures of the rectum." One help wondering whether such can indeed occur f a blue sky" or whether some previous ulceration ys present.

ntly I had a similar case in which laparotomy d a pelvis full of solid fæces which had escaped h a perforation about the size of a half-crown d in the lower sigmoid colon. At operation the appeared otherwise normal, and I was able to rise the affected area. The patient's condition, er, was very poor from the start, and he unately came to autopsy.

areful search showed evidence of considerable iculitis, and the presence of marked engorgement d the perforation led us to believe that it was t certainly the floor of a stercoral ulcer which had way.

rd County Hospital, ROBIN BURKITT.
Middlesex.

LETTER TO A NEPHEW

—I was a little perturbed by the views of the ctionate uncle" in your Students' Number. I t understand why the vocational urge to be a good r should be regarded as unhealthy, or why high should be incompatible with being a "wise, y, reliable human being."

e two attributes are surely independent of each . True, many idealists are extremely bigoted and w-minded; but there are others, of whom the William Temple may be taken as an example, who he most human of men. I am sure that if the ctionate uncle" were to delve into his experience ould find far more neurotics and other unstable nalities among those with low ideals than those with

is condemnation of idealists as freaks is deplorable. re would the drive for achievement in any walk of e found if it were not for ideals? The world would through sloth and idleness to its own destruction faster than it is drifting now. The man of ideals t the very person of integrity to whom the distressed d turn in time of trouble. Although the idealist es his wagon to a star, the wheels of his wagon are the less firmly placed upon the ground, and the that he has acquired in guiding them through the journey of life makes his advice all the more ble in helping those who are not so successful. ism and realism are complementary.

would suggest that the delightful picture that the ctionate uncle" drew of the trusted family doctor demands a definite vocation. He sets an ideal in cal practice that requires from the doctor unremit- service to his patients at all times of the day and . I believe that most men are idealists. They oth to admit it, however, because of the unfor- te association in men's minds of idealism with w-minded fanaticism.

X.Y.Z.

PRIVATE PATIENTS NOT ADMITTED

SIR,—In your last issue you take exception to my letter to the *Times* of Sept. 15 in which I uphold the decision of the Minister of Health to exclude private patients from the new health centres because, in my opinion, this is bound to lead to either preferential, more considerate, or better treatment for them. You say—

> "The truth seems to be that the great majority of patients remaining as private patients do so in order that they may suit their own convenience as to when, where, and how often, they consult their doctor."

But surely if private patients coming to the health centre are permitted to "suit their convenience" as to when they see their doctor, whereas other patients, except emergencies, have to make appointments between certain hours, they are receiving preferential treatment, and here of course I am using the term treatment to imply service and not medical treatment for disease.

It is quite permissible to argue that to admit private patients to health centres might have compensating advantages to the doctor or even to the service as a whole by saving the doctor's time, but to deny that it would involve two standards is absurd.

London, S.W.1. SOMERVILLE HASTINGS.

SELECTION OF TEACHERS

SIR,—Your Students' Number (Aug. 28) contained a concerted attack on the problem of selecting medical students. A scarcely less important problem is the selection of clinical teachers. The present system is very inefficient—so many teachers are dull and incompetent, so few brilliant and inspiring. Your peripatetic correspondent's son (Sept. 11) might be quoted.

I do not know how teachers are selected, but it seems that teaching ability is rarely considered. For those who have to make the choice it is indeed very difficult to assess; yet they never take the obvious step and ask students. Only his audience can judge whether a teacher is lucid and capable of holding its interest. Surely, Sir, there is some way of fairly estimating a man's ability to teach by asking those whom he has taught? This should apply as much to the promotion of a registrar to a chief assistant's post as to the appointment of an honorary at a teaching hospital. It is true that there are not enough good teachers to go round, but part of the reason is that many potentially good ones stop teaching when they have finished as registrars. If medical school authorities could judge which of the registrars were able teachers, they could encourage them to continue to teach. Provided their clinical and scientific ability was sufficient, an improvement in the general standard of teaching should result. CLINICAL STUDENT.

THE CASSEL HOSPITAL

SIR,—May I make two corrections to your account last week of the procedure used in selecting nurses for the Cassel Hospital for Functional Nervous Disorders?

Your heading described "The Cassel" as a mental hospital; it is a hospital for neurosis and it has never been a mental hospital nor admitted psychotic patients. The point is important in so far as your note may affect our recruitment of State-registered nurses for the year's course and certificate in the nursing of neurosis, or may discourage applicants for the Cassel bursaries, which permit a general trained nurse to obtain three months' intensive experience in this work, and then to return to her own hospital.

Secondly, Dr. C. H. Rogerson, my predecessor, is innocent of responsibility for the procedure, which owes much to War Office Selection Board methods. The system was introduced by the Matron, Miss D. Weddell, with the technical assistance of myself and my colleagues.

T. F. MAIN
The Cassel Hospital, Ham Common, Medical Director.
Richmond, Surrey.

". . . The great epidemic diseases are seven in number, malaria, plague, cholera, smallpox, typhus, yellow fever, and influenza. Others have had episodes of widespread activity, but these seven have been the great killers. . . ."—Dr. F. M. BURNET, F.R.S., *Med. J. Aust.* Sept. 11, 1948, p. 283.

storage. These extra calories were not available after omission of fat from the diet although an isocaloric mixture of carbohydrates and proteins was substituted. Lack of more detailed knowledge led Burr[5] to conclude: "There are ample reasons for recommending that the fat intake be not reduced much below the normal established habits."

London, W.1. Z. A. LEITNER.

SUPERNUMERARY NIPPLES

SIR,—While performing routine release medical examinations in the R.A.F. in 1946, I noted the incidence of supernumerary nipples in all cases. I also noted, by questioning and examination of the medical records, the cases of neurotic illness. I can thus present figures, tabulated below, of both a "neurotic" and a "non-neurotic" series examined under identical conditions. I had no idea of finding a connexion between supernumerary nipples and neurosis as the two factors were observed for different ends. The two series are selected only in that all subjects had passed a medical board on entry and had not been discharged on medical grounds —i.e., those severely handicapped by neurosis do not appear. I found no supernumerary nipples among 139 W.A.A.F. personnel, but the whole milk-line was not examined in their case.

—	—	No. of men	No. and per cent. with accessory nipple
Men without obvious neurotic illness	—	643	48 (7·5%)
Men with neurotic illness at some time during their service	Downgraded on this account	24	2 (8%)
	Not downgraded on this account	40	3 (7·5%)
	Total	64	5 (8%)

My figures do not show any significant difference in the incidence of accessory nipples between the neurotic and non-neurotic members of this group.

London, W.2. GORDON HESLING.

POLYARTERITIS NODOSA

SIR,—In connexion with the statement by Dr. Tonkin and Professor Pulvertaft (Aug. 21) that more than half of the cases of polyarteritis nodosa survive for a considerable time, the following report may be of interest.

A married man, aged 36, was admitted to St. Charles' Hospital on April 12, 1946, with loss of weight, persistent pyrexia, asthenia, pain in joints, cough, and occasional small hæmoptyses. He had been subject to "rheumatic" pains, but had had no serious illnesses. Three years previously he was in another hospital on account of hæmoptysis, pyrexia, night sweats, and a "red eruption" on the legs; blood-count normal and blood-culture negative; provisional diagnosis was meningococcal septicæmia. From 1943 till April, 1946, his health was fairly satisfactory except for occasional severe attacks of pain in the joints, legs, and arms, unrelieved even by complete rest.

On admission.—Thin, pale, and wasted. Temperature 99·2° F; pulse-rate 96 per min.; blood-pressure 190/70 mm. Hg. Urine: no albumin. He complained of blood-stained sputum, and pain in knees and lower back. Cardiovascular, respiratory, digestive, and central nervous systems clinically normal. Skin normal except for a few purpuric spots on the legs.

Investigations.—X-ray examination: evidence of bronchitis at base of right lung; lumbar spine normal. Sputum: no tubercle bacilli on examination. Blood-cultures negative. Urine: microscopical examination showed an occasional leucocyte. Blood Wassermann and Kahn reactions negative. Blood proteins normal. The only positive findings were: (1) constant moderate polymorphonuclear leucocytosis, with no eosinophilia; and (2) increased blood-sedimentation rate.

Progress.—After two weeks the temperature settled to normal, but the patient still looked ill and had joint pains. The diagnosis was obscure until the discovery of small hard nodules in different parts of the body on May 1. The nodules were dermo-hypodermic and mostly on forearms and thighs. A tentative diagnosis of periarteritis nodosa was confirmed later by histological examination of an nodule, the report on which read: "Periarteritis Chronic inflammation around and in the walls of vessels, with in places numerous polymorphs, and one contains a thrombus."

Unsuccessful attempts were made to demonstrate and/or infective ætiological factors. However, the atology suggested a chronic low-grade infection, patient was given empirically a course of parenteral from May 14 to 30. While this was being admini temperature rose each day to 99–102° F, although it normal in the two previous weeks.

The patient's general well-being improved rei and on May 24 only one small nodule on the inner of the right forearm could be seen. He was di home on June 10, and afterwards resumed his occupation of club steward. I heard recently t still well.

St. Charles' Hospital, London. A. I. SUCHETT-

POLYTHENE TUBING IN BLOOD-TRANSF

SIR,—Having read the article by Dr. Farq Dr. Lewis in your issue of Aug. 14, I conclud polythene catheters would be useful in blood-tr particularly for patients requiring fairly large of whole blood or packed red cells at a very Using a needle as an introducer, I have found it to insert polythene catheters, of 1 mm. bore, into The method is as follows:

A suitable length (about 9 in.) of polythene tubing, outside diameter of approximately 1·5 mm., is used will pass through a standard blood-taking needle (diameter approximately 1·75 mm.). The end of the is bevelled to coincide with the bevel of the needle. a side opening was also made in the catheter, but found that this weakened it so much as to make it to introduce. The catheter is inserted into the ta until the bevels of needle and catheter almost Under local anæsthesia, the needle, with contained is then inserted into the vein. The catheter is now through the needle for about 6 in. and the needle is w Where possible, the needle has been introduced into of the upper forearm and the catheter has been upwards until it is an inch or two beyond the el

If a tourniquet is used to produce venous dist should be released as soon as the needle has been Failure to do this may result in a leak at the si puncture when the needle is withdrawn. To ex blood is allowed to run down the catheter, which attached to the standard drip apparatus by me suitable cannula. This can be prepared by cutting needle so as to leave the shaft, approximately 1 with a smooth tapered tip. In all cases this has been to give a firm joint that does not leak. Suitable must be selected individually, for there appears to siderable variation in the outside diameter of the A sterile gauze dressing is applied at the site of p and the whole is held in position with a length of 2 in. st completely encircling the arm. The tubing of the is strapped to the arm in the form of a loop so as to direct traction on the catheter, but the cannula con should be left exposed so that any leak may be easily det The rate of flow can be easily regulated between 120 drops per minute, while greater rates may be by using positive pressure.

With this method whole-blood and packed-cell fusions have been easily maintained at a rate of drops per minute for periods of up to 60 hours.

Only in the first case did a transfusion stop of it accord. A needle was used in the catheter connexion, t with a very short catheter. The patient was restless a catheter was forced up until the needle was also in the Both catheter and vein were punctured and a hæm resulted. This difficulty has been overcome by the a longer catheter and the modified cannula already de

In one case we have given by this method th cells from 6 pints, and in another, 7 pints of whole Splinting has been unnecessary and the drip con to run when the patients' arms are folded. One n patient twice got out of bed without interfering cases where application has been made, dollars have forthcoming.

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[5] Burr, G. O., Barnes, R. H. *Physiol. Rev.* 1943, 23, 256.

F. J. ERROL: As the Member referred only to equip- for cancer research, does his reply, therefore, imply o dollars are to be available for the purchase of equipment ncer treatment as opposed to cancer research?— ALL: As to treatment, no application has been made. application is made, dollars will be found.

Extra Food for Blood Donors

LOUIS COMYNS asked the Minister of Food if he would ler the possibility of granting extra food points as an ragement for blood donors.—Dr. EDITH SUMMERSKILL d: Blood donors are never asked to give blood sufficiently ntly to impair their nutritional state. They are, of , given refreshments at the blood-transfusion centres. he Ministry of Food makes allowances of tea, sugar, and biscuits to the centres.

Tuberculosis in the Navy

plying to a question Mr. W. J. EDWARDS, parliamentary ary to the Admiralty, gave the following figures of the nce of tuberculosis in the Royal Navy.

rs and Men invalided for Pulmonary Tuberculosis ing the years 1940–46	9010
accepted by the Ministry of Pensions during the rs 1940–46	9614*
ttributable	3777
gravated	5837
s during service	430

ndes post-discharge claims from men invalided for reasons ther than tuberculosis.

Health Benefits for Foreigners

ptain JOHN CROWDER asked the Minister whether his ations entitled foreign nationals on a short visit to t Britain to full benefit under the National Health me, including the replacement of dentures or spectacles.— BEVAN replied: Yes.

Visitors to Ulster

r RONALD ROSS asked the Minister what arrangements d made for those registered under the National Health of Great Britain and Northern Ireland, respectively, h in that portion of the United Kingdom to which the under which they are registered does not apply.—Mr. AN replied: So far as Great Britain is concerned, the fits of the National Health Service are fully available ersons from any parts of the United Kingdom or else- re. As regards Northern Ireland, where the health ice is provided under an Act of the parliament of Northern and, I understand that arrangements have been or are g made for the service to be available to persons normally dent in Great Britain.

Health Centres

Sir HENRY MORRIS-JONES asked the Minister how many lth centres had been set up under the National Health vice Act; and whether he had any plans for the establish- of further centres in populous areas.—Mr. BEVAN replied: dispensaries from which general medical and dental vices were provided before July 5 are continuing as health ntres under the Act. I have approved a proposal to build centre on a developing housing estate in London; and the ovision of centres in other populous areas is under nsideration.

Fees for Ophthalmologists

Sir ERNEST GRAHAM-LITTLE asked the Minister if he was are that by the regulations S.I. 1273, 1948, and the state- nt specifying fees and charges for sight-testing opticians, e specialist ophthalmic surgeon, with at least ten years' dy before undertaking practice, would be at a monetary advantage as compared with the optician, who had had no mparable training, as in the example submitted to him; d if he would reconsider this position.—Mr. BEVAN replied: do not accept the assumption underlying the question. e remuneration of ophthalmic medical practitioners taking rt in the supplementary eye service has been fixed, in agree- nt with the profession, in the light of the Spens report the remuneration of consultants and specialists. The muneration of opticians for the supply and fitting of glasses approximately equal to the remuneration they received for e same services under the National Health Insurance heme.

Cost of Prescriptions and Spectacles

Sir HENRY MORRIS-JONES asked the Minister whether he would state the estimated cost of prescriptions dispensed under the National Health Service Act, and also the cost of supplying spectacles.—Mr. BEVAN replied: The estimated cost of prescriptions dispensed from July 5 to Aug. 5 is nearly £1,500,000. The amount paid from July 5 to Aug. 31 for sight-testing and supplying glasses under the supplementary ophthalmic service was £237,433, though this figure does not represent the full liabilities incurred during the period.

Cost of Dental Treatment

Sir ERNEST GRAHAM-LITTLE asked the Minister the cost to date of dental estimates submitted or approved by the Dental Estimates Board.—Mr. BEVAN replied: The board has authorised payment of a total of £708,307 up to Sept. 17.

Artificial Insemination

Mr. T. E. DRIBERG asked the Minister what facilities for artificial insemination were provided at clinics under the National Health Service; if such facilities included both A.I.(H.) and A.I.(D.); what information he had received from such clinics regarding the physical and mental health and development of children born as a result of artificial insemination; and if he would also make inquiries on this subject from private clinics.—Mr. BEVAN replied: No such facilities are provided. On the last part of the question I am not advised that such an inquiry would be justified.

Foot Clinics

Mr. SOMERVILLE HASTINGS asked the Minister why he had decided to discourage local authorities from opening foot clinics seeing that section 28 (1) of the National Health Services Act empowered these authorities to make arrangements for the purpose of the prevention of illness and that chiropody was essentially a preventive service.—Mr. BEVAN replied: I do not want to plunge into a general chiropody service without more advice. But I have told authorities that if experience shows the need they can put in proposals to me.

Spate of Prescriptions

Sir WALDRON SMITHERS asked the Minister if he was aware that the dispensation of doctors' prescriptions had, since the introduction of the health service, increased by more than 100%; and what steps he was taking to meet this situation.— Mr. BEVAN replied: I am not aware that chemists generally are experiencing difficulty in coping with the increased volume of dispensing.

Obituary

WILLIAM FREDERIC HARVEY

C.I.E., M.A., M.B. EDIN., F.R.C.P.E.

Lieut.-Colonel Harvey, who died in Edinburgh on Sept. 11 at the age of 76, was one of the original members of the Medical Research Department in India, where he gained a solid reputation both as investigator and administrator. Soon after his retirement in 1925 he joined the staff of the research laboratory at the Royal College of Physicians of Edinburgh, and for the many remaining years of his life he went on doing valuable work, especially on the structure and classification of new growths.

Born in 1873, he spent his childhood in India, where his father was an educational missionary in Travancore State. He returned to this country to go to school at Dollar Academy, and he continued his education at Edinburgh University and University College, London. In 1897 he graduated in medicine, with first-class honours, at Edinburgh, and two years later he joined the Indian Medical Service.

The following 27 years, which he spent in India, coincided with a time of widening opportunities for research in tropical medicine, and Harvey took full advantage of them. As an officer on probation he had already met Almroth Wright, who then held the chair of bacteriology at Netley, and later while on leave he worked in Wright's laboratory at St. Mary's. He was a great admirer of Wright's method, and when appointed deputy sanitary commissioner in the Punjab in 1902 he made many improvements in the manufacture and distribution of

Parliament

Army Cadets' Deaths from Heat-stroke

A STATEMENT circulated by Mr. EMANUEL SHINWELL, Secretary of State for War, includes the following information about the death from heat-stroke of two officer cadets at Aldershot after a physical-training exercise held on July 26, 1948.

The exercise was the fourth of a graduated series of physical-endurance exercises which formed a normal part of a physical-training syllabus designed, among other things, to make the cadets physically tough. Exercises of this type (though more severe) were introduced in 1942. They were made somewhat less exacting in 1944 and again in 1946, the latter change being the result of a fatality somewhat similar to this one. No other fatality has been reported during the last six years.

The exercises have been carried out in the past in all sorts of weather. The heat on this occasion, though exceptional, should not, taken by itself, have justified any major modification. Certain factors, however, combined to make the other conditions unusual. A strenuous morning's work, which took longer than was expected, was followed by a late lunch. The exercise was delayed and one instructor only—instead of two—could be made available.

The exercise started shortly after 3 P.M. The instructor, a sergeant, led the troop. After six miles they became somewhat strung out, and the instructor, hearing that one officer cadet had collapsed, called a halt; but, being informed that assistance had been summoned from barracks, he continued the exercise. An ambulance was summoned by telephone, but by an unfortunate chance was deflected to deal with another accident, and by the time it picked up the officer cadet some 35 or 40 minutes had elapsed. In the meantime a second officer cadet had collapsed. Cadets who were with him summoned help, and he was also collected by ambulance. Both cadets died the following morning, the cause of death being heart-failure due to heat-stroke.

"I am satisfied," Mr. Shinwell said, "that no officer or man can be charged with culpable negligence. It has been my object, however, to see that the instructing staffs at these schools should be specially picked and should realise that they have a special and important relationship to the young men in their care. I came to the conclusion that certain officers who were directly responsible for the exercise showed lack of judgment in allowing the exercise to proceed in the afternoon of such a hot day, after a strenuous morning and a rushed midday meal, and without the proper complement of instructors. I have accordingly ordered that they shall be replaced in their appointments."

A third officer cadet died after an exercise at Ripon.

The exercise was one of the standard physical-efficiency tests which are carried out once a year by all officers and men of Service units who are under 35 years of age and physically fit. This cadet had been passed medically fit for all duties on June 19.

July 28 was an unusually hot day, and in view of the heat the officer commanding the officer cadet squadron to which he belonged ordered that the officer-in-charge of the test was to take it easy and not to force the pace at all or allow the men to try to complete the course ahead of time. Also because of the heat the cadets were allowed to carry or wear steel helmets as they wished. The cadets had had an easy morning, chiefly lectures, and were not at all rushed.

The party undergoing the test consisted of about 40 cadets under an officer, assisted by a physical-training instructor and one sapper who was under training to become an instructor. The party marched for the first 5 or 6 miles; after this the officer-in-charge thought that a number of cadets would not finish the course in the time allotted, and allowed them to fall out and follow independently or to make their own way back to camp. Two cadets were sent back to the camp by car, and on arrival there an ambulance was sent to collect those who had fallen out.

Meanwhile, after about 8 miles, this officer cadet, who was among those who were straggling behind, became very distressed and collapsed. He was left under the charge of the instructor, who took him by ambulance to the camp reception station, where he arrived 45 minutes later. The medical officer-in-charge decided that the only course was to get him to York Military Hospital as quickly as possible. Emergency treatment was begun at once and was continued medical officer in the ambulance all the way to York, he arrived at 6 P.M., some two hours after he had He died of heat-stroke shortly after midnight.

Mr. Shinwell concluded that "no-one was to b the tragic death of this officer cadet."

Adjournment

On Sept. 24 Parliament adjourned until M Oct. 25.

QUESTION TIME

The Common Cold

Mr. JOHN LEWIS asked the Lord President of the to what extent the Medical Research Council and similar organisations had been concerned during t year with investigation into the cause and cure of the cold; what sums had been expended on this research what results had been attained.—Mr. HERBERT M replied: The Medical Research Council, with the of the Ministry of Health, have continued to maintain into the nature and transmission of the infection human volunteers, at the Harvard Hospital, The cost to the council during the last financial approximately £9500, exclusive of hospital acco and services provided by the Ministry of Health. progress has been made, but there are as yet no capable of practical application. Mr. LEWIS: Is totally inadequate sum being spent on investigation this matter, which quite obviously is costing the many millions of pounds every year?—Mr. MORRI I was quite sure that by going to the Treasury and for a substantial addition we would automatically problem, I would do so; and I agree that it w But money spent upon research must be governed likely practical results from the expenditure. We all we can. Mr. LEWIS: How can one possibly say the likely results will be unless money is spent on —Mr. MORRISON: That is a very wasteful philoso

World Health Assembly and Mental He

Mr. FRANCIS NOEL-BAKER asked the Minister of whether he was satisfied that the composition of the delegation to the World Health Assembly was su enable it to play an adequate part in discussions re psychiatry and mental health; and whether l consider strengthening British delegations to future of the organisation by the inclusion of experts in subjects.—Mr. ANEURIN BEVAN replied: This assem little concerned with technical discussion of psychia mental health. I shall certainly have in mind i an expert in these subjects in any future delegations I am clear the probable subject matter warrants it.

Compensation on Resignation from N.H.S.

Sir ERNEST GRAHAM-LITTLE asked the Minister w in the event of a doctor electing to resign from the N Health Service shortly after entry, and having giv necessary three months' notice of resignation, his compe for loss of practice goodwill will be payable; and withi waiting period.—Mr. BEVAN replied: Payment will be as soon as the information is available on which the a due can be calculated. Meantime, a payment on a will be made if hardship would otherwise be involved

Apparatus for Cancer Research

Air Commodore A. V. HARVEY asked the Chance the Exchequer if he was satisfied that sufficient U.S cu had been made available to enable modern equipmen purchased for the treatment of cancer.—Mr. GLENVII replied: It has been agreed with the British Empire Campaign that dollar exchange will be made availa the purchase of any scientific apparatus essential for research which can only be obtained from the United Air Commodore HARVEY: Is the Minister aware tha is a feeling in the medical profession that for much equ which is required dollars are not available, and i requests are made to the Bank of England will he i the Bank to deal with these applications favoura Mr. HALL: My information is that everything is v very smoothly. We have had no complaints wh

NTILE GASTRO-ENTERITIS TREATED
VITH STREPTOMYCIN BY MOUTH

RSULA JAMES   IVOR R. H. KRAMER
B. Lond., M.R.C.P.   L.D.S. R.C.S.
SISTANT PHYSICIAN   ASSISTANT PATHOLOGIST
SS LOUISE CHILDREN'S UNIT, ST. MARY'S HOSPITAL,
LONDON

With a statistical analysis of results by

P. ARMITAGE
B A.

Medical Research Council Statistical Research Unit, London School of Hygiene and Tropical Medicine

n outbreak of gastro-enteritis investigated by us winter 1946–47 and reported to the British tric Association (James 1947) *Proteus vulgaris* was d from the stools in every case and believed to part in the ætiology. *P. morganii* and organisms salmonella and shigella groups were excluded.

iew of these findings and of reports from elsewhere treptomycin given by mouth produces bacterio- throughout the gut, and that naturally occurring s of *P. vulgaris* are usually sensitive to streptomycin, ned logical to give streptomycin by mouth in cases of -enteritis associated with *P. vulgaris* in the stools were not responding to routine treatment. It emed important to establish whether streptomycin by mouth was of any value in cases where *lgaris* was not found in the stools. Therefore such its were given streptomycin by mouth when routine nent was unsuccessful and the prognosis was grave. tiological factors in these cases were not known.

April, 1947, as a preliminary investigation, strepto- was given by mouth to two infants with mild œa associated with *P. vulgaris* in the stools. was done solely to determine whether the organism be eliminated from the stools by this method, he enteritis was so mild that these cases are not led in the present series.

is report is based on thirty treated cases, which are dered in three categories :

up A : cases from an outbreak of epidemic diarrhœa newborn.

up B : cases from an outbreak of gastro-enteritis in a ntial nursery.

up C : cases of gastro-enteritis in this Children's Unit, ding patients critically ill on admission and cases not nding to routine treatment.

outine treatment of all cases, except those in group C cally ill on admission, consisted of an initial period tarvation for 24 hours, during which sterile water e was given by mouth, followed by the gradual ding up of milk feeds at the rate of 60 calories a When possible, expressed breast-milk was given ; rwise half-cream or full-cream National Dried Milk used according to the age of the child. All feeds e made up to 20 calories to the ounce, and extra r was given as needed. Sugar was not added to feeds until the 3rd or 4th day. When intravenous s were indicated, one-fifth physiological saline with glucose or a quarter physiological saline with 2·5% ose was used ; and, if intravenous therapy was inued for longer than 24–48 hours, protein hydro- te solution supplemented the glucose-saline solution. mins by mouth were not given until full feeds had reached.

osage of Streptomycin by Mouth.—To maintain a tant bacteriostatic concentration, the total daily of streptomycin was dissolved in sterile water, and an l fraction was given immediately before each feed.

ases 10 and 20 were given a total of 2 g. in 4 days. iew of the scarcity of streptomycin and the early disappearance of *P. vulgaris* from the stools it was hoped that a smaller dose would be adequate, and cases 12 and 13 received 1 g. in 4 days. However, the organism reappeared in 2 days ; therefore all other cases were treated with 2 g. in 7 days : 0·5 g. in the first 24 hours, and 0·25 g. in each subsequent 24 hours for a further 6 days. The higher initial dose was given because of the known tendency of organisms to become resistant to streptomycin in a short time.

It was found convenient to make up the streptomycin solution so that the fraction of the daily dose to be given before each feed was contained in 1 ml. The solution was given with a spoon or a pipette, or direct from the hub of a syringe, and appeared to be palatable. No vomiting could be attributed to the streptomycin.

We found that the children having streptomycin tolerated milk feeds well, and that these could be increased at the rate of 100 calories a day. When streptomycin was started during the later stages of routine treatment, no further period of starvation was necessary, and the feeds could be increased at the rate of 100 calories a day from the level already reached.

GROUP A : EPIDEMIC DIARRHŒA OF THE NEWBORN

An epidemic of diarrhœa broke out in a maternity hospital. Fig. 1 shows the progress of four treated cases compared with that of twenty-three control cases occurring in the same period and receiving routine treatment only. The four cases selected for streptomycin therapy were the most severe in the outbreak. Jaundice had developed in three of them on the 18th, 34th, and 7th days of life.

CASE 1 was a premature infant weighing at birth 3 lb. 3 oz. Diarrhœa started on the 20th day of life, the latest onset in this group. Stool cultures were negative, and after 19 days' routine treatment (two periods of starvation followed by increasing feeds with an interval of 7 days during which she had full feeds) there was a sudden deterioration in her condition, and she appeared moribund. Her response to streptomycin was dramatic, and she regained her greatest previous weight (a gain of 13 oz.) in 10 days.

CASES 2 and 3 were selected for streptomycin treatment because of the severity of the gastro-enteritis, the lack of response to routine treatment, and the development of jaundice.

CASE 4 did not become jaundiced, but the combination of dehydration with œdema and the lack of any response to routine treatment prompted the administration of streptomycin.

The average number of days taken to regain the greatest weight reached before the illness was 12 in the treated cases compared with 25 (minimum 12, maximum 43) in the twenty-three less severe cases (fig. 1).

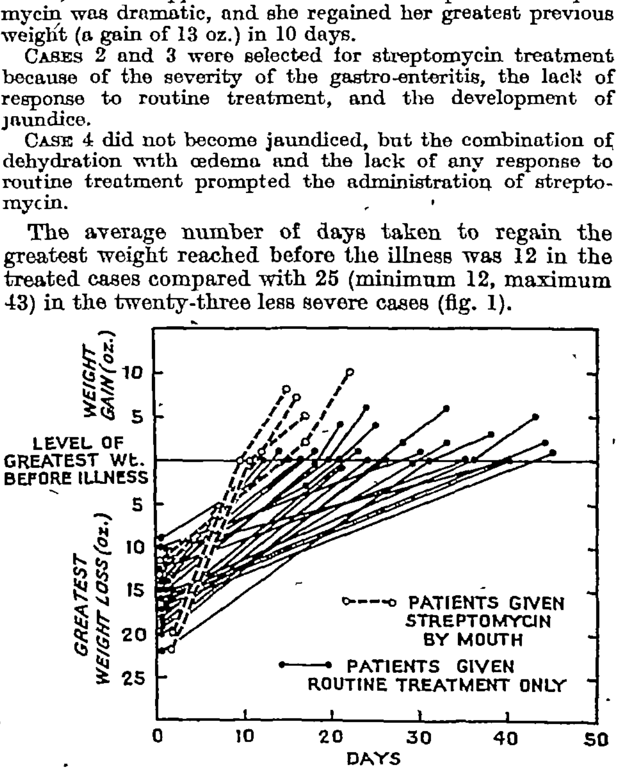


Fig. 1—Rates of return from points of greatest loss of weight to greatest weight reached before illness in epidemic diarrhœa of newborn (group A).

vaccine lymph and introduced glycerinated lymph into the province. Another lasting influence on his approach to medical problems was Karl Pearson, from whom he derived his critical approach to research.

When the government of India constituted the Medical Research Department (or Bacteriological Department as it was first called), Harvey was one of the first group of officers, which included Bannerman, Semple, Lamb, Lieut.-Colonel Glen Liston, Sir Rickard Christophers, S. P. James, and A. G. McKendrick who became his lifelong friend. His first post in the new department was as assistant director of the Pasteur Institute of India, and in 1905 he succeeded Lamb as director. McKendrick became his assistant and together they carried out the researches into the prevention of rabies which led to the introduction of Semple's carbolised vaccine.

In 1911 Harvey was appointed director of the Central Research Institute at Kasauli, where he devoted himself largely to bacteriological and immunological problems, particularly methods of technique. On these subjects he published many papers in the *Indian Journal of Medical Research*, of which he was the first editor when it was founded in 1913. His work was interrupted by the first world war; for in 1916 he was recalled to military service and appointed an A.D.M.S. in Mesopotamia. There he was one of the officers called upon to reorganise the medical side of the Army after the earlier campaigns, and his work won a mention in despatches. After an attack of paratyphoid fever he was invalided to India and he returned to Kasauli till he retired in 1925. He was appointed C.I.E. in 1921. Of this part of his career a colleague says: "Harvey was very much liked by all who came in contact with him, and his advice was freely sought and readily given on all subjects connected with research in India. He was always constructive in his criticisms of any work on which his counsel was sought."

'Settling in Edinburgh, Harvey in 1927 succeeded James W. Dawson as histopathologist to the laboratory of the Royal College of Physicians of Edinburgh. The results of this new work appeared in the next 20 years in his papers in the *Edinburgh Medical Journal*, on such subjects as the standardisation of blood examination, irradiation effect on the skin, carcino-sarcoma, and chordoma. His series of studies, in collaboration with E. K. Dawson and J. R. M. Innes, on debatable tumours in human and animal pathology, were later issued as a monograph. For a short time he took Colonel McKendrick's place as superintendent of the laboratory, and he continued the heavy routine reporting involved by war conditions until 1946 when he was freed to continue his tumour studies.' For his work the college awarded him the Lister and Freeland-Barbour fellowships and in 1946 the Cullen prize. He represented the college on the Imperial Cancer Research Fund committee and he was also a vice-president of the Royal Society of Edinburgh and a section editor of the *Tropical Diseases Bulletin*.

Sir Rickard Christophers writes: During his time in India Colonel Harvey played an important part in the development of the bacteriological service and especially in the expansion of the activities of the Central Research Institute, Kasauli, the government research laboratory. Not only was he an able bacteriologist and research-worker but he had high capabilities as an administrator, and many who have worked under him as director will remember his unfailing sympathetic and helpful advice and staunch support where such was needed. Though of a somewhat retiring disposition, he had a great gift of making loyal and lasting friends. He was a man of wide interests and many activities, and one of his outstanding characteristics was the thoroughness with which he carried out any work he undertook. In such cases no labour was too great and the object was pursued with a doggedness which usually achieved its end. As an example, when on retirement he became engaged in reviewing papers for a certain journal he surprised his friends by learning Dutch, and as a result must have been one of the very few British research-workers in his line who could read Dutch scientific papers in the original. After retirement and when working in the Edinburgh Pathological Diagnosis Laboratory he so developed his knowledge of tumours that he became a recognised authority on this subject. With this he was pleasant hospitable friend, a keen tennis-player great social acquisition. Many will regret his who knew him at his station in Kasauli more kindly local magnate than the hard-working

Colonel Harvey married in 1910 Miss Jean They had a daughter and a son who is also a doctor.

Diary of the Week

OCT. 3 TO 9

Monday, 4th

Royal College of Surgeons, Lincoln's Inn Fields, W.C.
5 p.m. Mr. Guy Blackburn: Traumatic Injuries of the

Tuesday, 5th

Royal College of Surgeons
5 p.m. Mr. A. B. Wallace: Treatment of Burns.
Institute of Dermatology, 5, Lisle Street, W.C.2
5 p.m. Dr. R. T. Brain: Dermatoses of Childhood.

Wednesday, 6th

Royal College of Surgeons
5 p.m. Prof. F. H. Bentley: Interpretation of Visceral
University of Glasgow
8 p.m. (Department of Ophthalmology.) Mr. Frank
Physiotherapy of the Eye.

Thursday, 7th

London County Council Medical Society
3.45 p.m. (Friends House, Euston Road, N.W.1.) Mr
Pyke, D.SC., Miss R. M. Simmonds: Nutrition in
Institute of Dermatology
5 p.m. Dr. R. M. B. MacKenna: Modern Trends in Der

Friday, 8th

Royal College of Surgeons
5 p.m. Mr. H. Jackson Burrows: Bone-graft Surgery.

Births, Marriages, and Deaths

BIRTHS

Barclay.—On Sept. 15, at Waltham Abbey, the wife of Barclay, F.R.C.S.—a son.

Cox.—On Sept. 25, in London, the wife of Dr. A. G. C. Co

Danckwerts.—On Sept. 21, at Kenilworth, the wife of Dr. Danckwerts—a daughter.

Eden.—On Sept. 16, at Vancouver, British Columbia, of Dr. John Eden—a daughter.

Elmes.—On Sept. 20, at Sherborne, the wife of Dr. B. G. T. a daughter.

Gareh.—On Sept. 20, at Harrow, the wife of Major R.A.M.C.—a son.

Gowar.—On Sept. 20, at Aberdeen, the wife of Mr. F. J. Gowar, V.R.D., F.R.C.S.—a daughter.

Hardy.—On Sept. 18, at Truro, the wife of Dr. J. D. a daughter.

Harman.—On Sept. 25, in London, the wife of Dr. J. B. —a daughter.

Inkster.—On Sept. 17, at Stockton-on-Tees, the wife of J. S. Inkster, R.A.M.C.—a daughter.

Kidd.—On Sept. 14, at Grendon Underwood, Bucks, the Dr. Humphry Kidd—a daughter.

Lovett Doust.—On Sept. 19, in London, the wife of Dr Lovett Doust—a daughter.

MacLeod.—On Sept. 21, at Clevedon, Somerset, the wife Alastair MacLeod—a daughter.

Nairac.—On Aug. 31, in Mauritius, the wife of Dr. M. L. —a son.

Pierce.—On Sept. 21, in London, the wife of Dr. John a daughter.

Rollason.—On Sept. 27, at Scunthorpe, the wife of Dr. Rollason—a son.

Scott.—On Sept. 18, in London, the wife of Dr. I. M. Scott a son.

Thoms.—On Sept. 22, at Bognor Regis, the wife of Commander Geoffrey Thoms, R.N.—a son.

Venning.—On Sept. 25, in London, to Dr. Ruth Venning Barker), wife of Dr. G. R. Venning—a son and a daughter.

MARRIAGES

Lees—Fawcus.—On Sept. 18, at Aston Clinton, Bucks, Lees, M.B., to Pamela Joan Fawcus.

Wetherell—Mann.—On Sept. 18, at East Budleigh, Wetherell, M.B., to Rosemary Mann.

DEATHS

Boulton.—On Sept. 19, Norman John Boulton, M.R.C.S., aged

Fisher.—On Sept. 25, at Barnton, Midlothian, Edward Fisher, M.B. Lond., F.R.C.S., M.R.C.P.E., D.P.H.

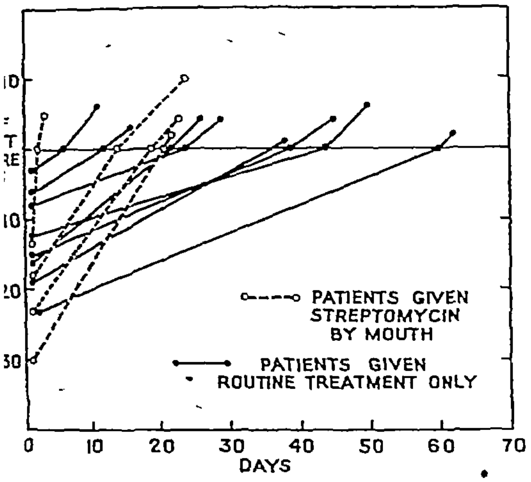
Gavronsky.—On Sept. 24, Jacob Osip Gavronsky, M.D. aged 70.

Ghosh.—On Sept. 24, at Salford Royal Hospital, Ghosh, F.R.C.S.I., D.P.H., aged 61.

Gibson.—On Sept. 16, Harold Edward Gibson, M.A., D.M. Oxfd.

Potts.—On Sept. 25, at Woking, Surrey, Edmund Thurlow C.M.G., D.S.O., M.D. Edin., lieut.-colonel, R.A.M.C. retd.

Shubik.—On Sept. 20, 1948, at Oxford, Nancy Gwendolyn M.R.C.S., D.P.H.



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average recovery-rate in these four cases was lays—considerably shorter than that of the less ly ill controls:

	Controls	*Treated*
e weight loss (oz.)	12 6	21·5
e recovery-rate (days)	30 75	11·4
aris present in stools	5	4
aris absent from stools	2	0
not examined	1	0
e time for stools to become al after streptomycin (days)	12 2	3·8
	2 wk. to 1¼ yr.	3 to 7 mos.

this group it seems certain that streptomycin py speeded up recovery. Two patients were ally ill when it was started; one was not seriously it was not improving on routine treatment; and ourth child had recurrent diarrhœa and was probably ource of infection in the nursery outbreak.

GROUP C: GASTRO-ENTERITIS IN THE CHILDREN'S UNIT

nts Critically Ill on Admission

es 9, 10, and 11 were admitted in a critical condition gastro-enteritis, and it was thought unwise to spend in giving routine treatment alone.

E 9, a boy aged 4 months, was admitted from another al, where he had been treated for gastro-enteritis and ad 4 serious relapses in 24 days. On each occasion he had tarved and given intravenous and intraperitoneal fluids. ting was copious, and his 5–8 stools a day were large, and offensive. His weight loss was over 2 lb. 3 oz. o parenteral fluids (his greatest weight before illness ot known). Oral streptomycin was started, and feeds calories in the first 24 hours with additional water) given by mouth and retained, no further parenteral being required. The stools improved and were normal days, the feeds being increased by 100 calories a day. atient was fit for discharge 10 days after admission but had to remain in hospital another 10 days because of housing difficulties. During his 3 weeks' stay he gained 2 lb. and he gained a further 2 lb. in the 3 weeks following his discharge (fig. 6).

CASE 10, a boy aged 5 weeks, was admitted with severe gastro-enteritis of 2 days' standing. He had been offered full feeds but had taken only a few ounces in these 48 hours. His vomiting was copious, and the stools were large and entirely fluid (8 having been passed in the 10 hours before admission, and 12 in the 24 hours before that). On admission he was cold, collapsed, semiconscious, and grossly dehydrated. Intravenous fluids (2·5% glucose in *N*/4 saline) and streptomycin by mouth were given immediately. Water was given by mouth, and milk feeds were started 12 hours later, these being increased at the rate of 100 calories a day. Vomiting ceased after the first dose of streptomycin, and no further parenteral fluids were needed. No stools were passed for 48 hours. The patient's recovery was uneventful, and he was discharged 9 days after admission, having gained 25 oz. (fig. 6).

CASE 11, a girl aged 8 months, was transferred from a voluntary hospital, where routine treatment with intravenous fluids had been given for gastro-enteritis of 6 days' standing, this treatment being in accordance with our schedule. Her condition was considered hopeless; she had retained no fluids by mouth for 6 days, and was having copious fluid stools. She took streptomycin by mouth well and had no further vomiting, her stools improving in 3 days. Feeds were started on the 1st day, beginning at 100 calories and increasing to full feeds in 6 days. She was discharged 12 days after admission, having gained 20 oz., and a month later she had gained a further 4 lb. (fig. 6).

These were the only patients in the series to be given streptomycin on the day of admission. The speed of their response to streptomycin therapy was spectacular, and two of them needed no further parenteral fluids. They were ready for discharge in 9, 10, and 12 days.

Cases not Responding to Routine Treatment

The nineteen patients in this group were aged from 9 days to 13 months and were either admitted with gastro-enteritis or developed it in hospital. Five patients were under 3 months old and were all admitted with gastro-enteritis. Cases 12 and 13 were premature twins with birth weights of 4 lb. 4 oz. and 2 lb. 15 oz., and both developed gastro-enteritis within a few days of each other when 6 weeks old. Both responded well to streptomycin, not having improved on several days' routine treatment (fig. 7).

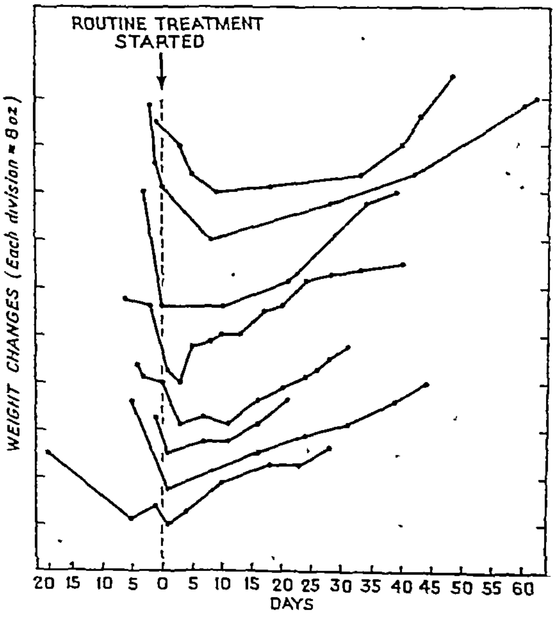


Fig. 3—Weight changes in 8 controls (group B).

GROUP B: EPIDEMIC GASTRO-ENTERITIS IN A RESIDENTIAL NURSERY

An epidemic of gastro-enteritis broke out in a residential nursery among infants under 2 years of age, twelve children being affected.

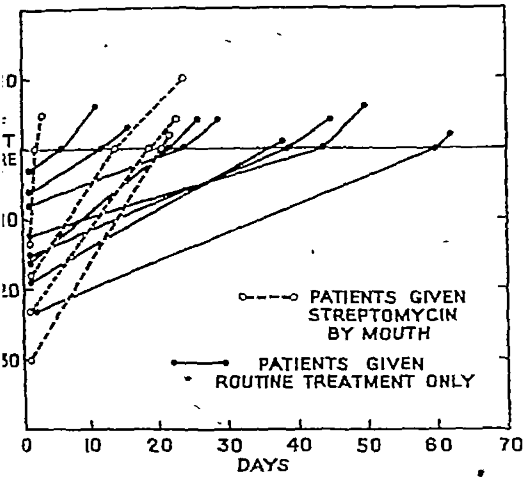
The controls consisted of eight cases of moderate severity in infants aged from 2 weeks to $1^3/_4$ years. They were given routine treatment. The loss of weight was 3–23 oz. (average 12·6 oz.), and the recovery-rate (time taken to regain the greatest weight reached the illness) was 6–60 (average 30·75) days (accompanying table and figs. 2 and 3). In five the eight cases *P. vulgaris* was isolated from the All these children recovered, but their progress

The treated patients numbered four and 3–11 months. Cases 5, 6, and 7 were much more ill than any of the controls. They each received treatment for 11, 5, and 4 days respectively,

RESULTS OF TREATMENT OF INFANTILE GASTRO-ENTERITIS WITH STREPTOMYCIN BY MOUTH

Group		Case no.	Sex	Age on admission	Birth weight before treatment		Max. weight before treatment		Max. weight loss		Length of history before admission (days)	Duration of routine treatment (days)	Clinical condition				Complications	Bacteriology of stool	General progress
					(lb.	oz.)	(lb.	oz.)	(lb.	oz.)			Vomiting	Dehydration	Diarrhœa	Jaundice			
Group A		1	F	3 wk.	3	3	4	15		12	—	19	Mod.	Mod.	Sev.	Mod.	None	Neg.	Excellent
		2	F	10 days	5	1	5	1	1	6	—	5	None	Sev.	Mod.	Mod.	None	Neg.	Excellent
		3	F	6 days	6	5	6	5		14	—	3	None	Mod.	Sev.	Mod.	None	*P. morganii*	Excellent
		4	M	12 days	7	7	7	7	1	4	—	4	None	None	Sev.	None	None	*P. vulgaris*	V. good
Group B		5	F	7 mos.	7	9	16	5	1	14	—	5	Mod.	Sev.	Sev.	None	None	*P. vulgaris*	V. good
		6	M	6 mos.	5	4	9	8	1	8	—	11	None	Slt.	Sev.	None	Prematurity and malnutrition	*P. vulgaris*	V. good
		7	M	3 mos.	8	0	10	8	1	2	—	4	Sev.	Sev.	Sev.	None	None	*P. vulgaris*	V. good
		8	M	11 mos.	7	2	15	0		14	—	4	None	None	Mild*	None	Inf. eczema, recurrent gastro-enteritis since 9 mos. old	*P. vulgaris*	V. good
Group C	Critically ill	9	M	4 mos.	10	10	?11	13	2	13	24	—	Sev.	Sev.	Sev.	None	Right middle-lobe pneumonia	*P. vulgaris*	Excellent
		10	M	5 wk.	7	8	8	15	1	6	2	—	Sev.	Sev.	Sev.	None	None	*P. vulgaris*	Excellent
		11	F	8 mos.	7	12	?		2	9	5	—	Sev.	Sev.	Sev.	None	Pertussis → pneumonia 2 wk. before gastro-enteritis	Neg.	Excellent
	Not responding to routine treatment	12	F	6 wk.	4	4	5	12		4	2	4	Slt.	None	Sev.	None	None	*P. vulgaris*	Good
		13	F	6 wk.	2	5	4	4		9	2	3	None	Mod.	Mod.	None	Anæmia	*P. vulgaris*	Slow
		14	M	2 mos.	8	4	8	15	1	0	—	4	Slt.	Slt.	Mod.	None	2 attacks of gastro-enteritis	*P. vulgaris*	V. go
		15	F	5 wk.	7	4	9	4	2	10	4	32	Sev.	Sev.	Sev.	Sev.	Bilateral mastoiditis	Neg.	V. good
		16	F	9 days	4	4	4	4	?		—	5	Mod.	Mod.	Sev.	Sev.	Died	Neg.	—
		17	F	3 mos.	9	0	10	6		5	70*	15	Mod.	None	Mod.	None	Recurrent gastro-enteritis	*P. vulgaris*	Good
		18	M	4 mos.	6	0	13	15	2	3	10	12	Sev.	Mod.	Sev.	None	Bilateral mastoiditis	*P. vulgaris*	None attributable to streptomycin
		19	M	4 mos.	6	10	12	8	1	4	—	8	Sev.	Sev.	Sev.	None	Intussusception and pyelitis	*P. vulgaris*	V. good
		20	M	4 mos.	6	12	11	2		12	3	16	None	None	Mod.	None	None	*P. vulgaris*	V. good
		21	M	5 mos.	?		15	1	1	10	8	4	Mod.	Sev.	Sev.	None	None	*P. vulgaris*	Good
		22	M	3 mos.	?		13	8	1	10	—	9	Mod.	Sev.	Sev.	None	Otitis media	Neg.	V. good
		23	F	3 mos.	7	9	?		—		—	4	Sev.	Mod.	Sev.	None	Pneumonia and pyelitis	Neg.	Good
		24	M	3 mos.	6	6	8	11		11	—	4	None	Slt.	Sev.	None	Marasmus since 2 wk. old	*P. vulgaris*	Good
		25	M	6 mos.	?		17	12	4	0	—	17	Mod.	Sev.	Sev.	Slt.	Eczema	*P. vulgaris*	V. good
		26	M	9 mos.	7	7	19	12	2	1	3	5	Sev.	Slt.	Sev.	None	None	*P. vulgaris*	V. good
		27	M	13 mos.	?		23	5	2	12	5	4	Sev.	Sev.	Sev.	None	None	Neg.	V. good
		28	M	7 mos.	?		16	6	2	3	—	9	Sev.	Sev.	Sev.	None	Pneumonia and chickenpox	Neg.	V. good
		29	M	6 mos.	7	1	17	10	2	10	5	8	Sev.	Mod.	Sev.	None	None	Neg.	Good
		30	M	7 mos.	6	0	18	6	2	0	—	11	None	Slt.	Sev.	None	Eczema	*P. vulgaris*	Slow

* Recurrent gastro-enteritis.



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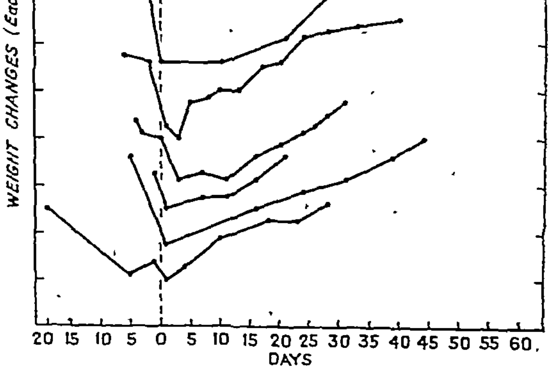

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					(lb.	oz.)	(lb.	oz.)	(lb.	oz.)			Vomiting	Dehydration	Diarrhœa	Jaundice			
Group A		1	F	3 wk.	3	3	4	15		12	—	19	Mod.	Mod.	Sev.	Mod.	None	Neg.	Excellent
		2	F	10 days	5	1	5	1	1	6	—	5	None	Sev.	Mod.	Mod.	None	Neg.	Excellent
		3	F	6 days	6	5	6	5		14	—	3	None	Mod.	Sev.	Mod.	None	*P. morganii*	Excellent
		4	M	12 days	7	7	7	7	1	4	—	4	None	None	Sev.	None	None	*P. vulgaris*	V. good
Group B		5	F	7 mos.	7	9	16	5	1	14	—	5	Mod.	Sev.	Sev.	None	None	*P. vulgaris*	V. good
		6	M	6 mos.	5	4	9	8	1	8	—	11	None	Slt.	Sev.	None	Prematurity and malnutrition	*P. vulgaris*	V. good
		7	M	3 mos.	8	0	10	8	1	2	—	4	Sev.	Sev.	Sev.	None	None	*P. vulgaris*	V. good
		8	M	11 mos.	7	2	15	0		14	—	4	None	None	Mild*	None	Inf. eczema, recurrent gastro-enteritis since 9 mos. old	*P. vulgaris*	V. good
Group C	Critically ill	9	M	4 mos.	10	10	11	13	2	13	24	—	Sev.	Sev.	Sev.	None	Right middle-lobe pneumonia	*P. vulgaris*	Excellent
		10	M	5 wk.	7	8	8	15	1	6	2	—	Sev.	Sev.	Sev.	None	None	*P. vulgaris*	Excellent
		11	F	8 mos.	7	12	?		2	9	5	—	Sev.	Sev.	Sev.	None	Pertussis → pneumonia 2 wk. before gastro-enteritis	Neg.	Excellent
	Not responding to routine treatment	12	F	6 wk.	4	4	5	12		4	2	4	Slt.	None	Sev.	None	None	*P. vulgaris*	Good
		13	F	6 wk.	2	5	4	4		9	2	3	None	Mod.	Mod.	None	Anæmia	*P. vulgaris*	Slow
		14	M	2 mos.	8	4	8	15	1	0	—	4	Slt.	Slt.	Mod.	None	2 attacks of gastro-enteritis	*P. vulgaris*	V. good
		15	F	5 wk.	7	4	9	4	2	10	4	32	Sev.	Sev.	Sev.	Sev.	Bilateral mastoiditis	Neg.	V. good
		16	F	9 days	4	4	4	4	?		—	5	Mod.	Mod.	Sev.	Sev.	Died	Neg.	—
		17	F	3 mos.	9	0	10	6		5	70*	15	Mod.	None	Mod.	None	Recurrent gastro-enteritis	*P. vulgaris*	Good
		18	M	4 mos.	6	0	13	15	2	3	10	12	Sev.	Mod.	Sev.	None	Bilateral mastoiditis	*P. vulgaris*	None attributable to streptomycin
		19	M	4 mos.	6	10	12	8	1	4	—	8	Sev.	Sev.	Sev.	None	Intussusception and pyelitis	*P. vulgaris*	V. good
		20	M	4 mos.	6	12	11	2		12	3	10	None	None	Mod.	None	None	*P. vulgaris*	V. good
		21	M	5 mos.	?		15	1	1	10	8	4	Mod.	Sev.	Sev.	None	None	*P. vulgaris*	Good
		22	M	3 mos.	?		13	8	1	10	—	9	Mod.	Sev.	Sev.	None	Otitis media	Neg.	V. good
		23	F	3 mos.	7	0	?		—		—	4	Sev.	Mod.	Sev.	None	Pneumonia and pyelitis	Neg.	Good
		24	M	3 mos.	6	6	8	11		11	—	4	None	Slt.	Sev.	None	Marasmus since 2 wk. old	*P. vulgaris*	Good
		25	M	6 mos.	?		17	12	1	0	—	17	Mod.	Sev.	Sev.	Slt.	Eczema	*P. vulgaris*	V. good
		26	M	9 mos.	7	7	19	12	2	1	3	5	Sev.	Slt.	Sev.	None	None	*P. vulgaris*	V. good
		27	M	13 mos.	?		23	5	2	12	5	4	Sev.	Sev.	Sev.	None	None	Neg.	V. good
		28	M	7 mos.	?		16	6	2	3	—	9	Sev.	Sev.	Sev.	None	Pneumonia and chickenpox	Neg.	V. good
		29	M	6 mos.	7	1	17	10	2	10	5	8	Sev.	Mod.	Sev.	None	None	Neg.	Good
		30	M	7 mos.	6	0	18	6	2	0	—	11	None	Slt.	Sev.	None	Eczema	*P. vulgaris*	Slow

* Recurrent gastro-enteritis.

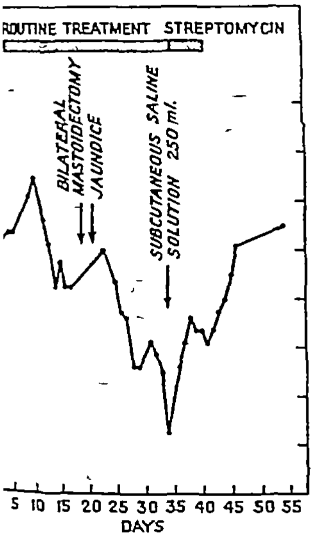
ed it in the ward, having been admitted with

25. After 5 days' routine treatment, during which a and vomiting persisted, a bilateral mastoidectomy ne and necrotic bone was found on one side, but from it remained sterile. The boy's symptoms con- and despite intravenous and subcutaneous saline ravenous protein hydrolysate, the weight loss over days was 4 lb. Streptomycin was given by mouth, overy was rapid and uneventful. In the week on nycin the patient gained 1 lb. 6 oz. (fig. 13).

ccompanying table shows the salient features of all ted cases.

SUMMARY OF RESULTS

ty-eight of the thirty cases described responded torily to streptomycin given by mouth. One 16) died, and another (case 18) had bilateral mastoiditis, which was treated surgically, the child's recovery being in no way attributable to streptomycin.



Weight changes in case 15 (group C), sponding to routine treatment or to ral mastoidectomy and given strepto- n by mouth.

Weight seemed to be the most reliable measurable index of a child's progress. Since intravenous and subcutaneous saline was seldom necessary after starting streptomycin therapy, the gains shown in figs. 1–13 were not influenced by parenteral fluids, except in cases 5 and 10. In some cases the weight continued to fall during the first 24 hours of treatment with streptomycin, but after the gains were spectacular. We considered ossibility of encountering these rapid gains in healthy ren given streptomycin. Three such children, 4, 5, and 10 months, were weighed daily for 14 the same diets being given throughout, and tomycin given by mouth in the same dosage as ar gastro-enteritis cases for the last 7 days. No rence was found in the rate of gain in the two weeks. gains in weight of the treated patients and of the rols are compared below.

ools.—In most cases improvement in the general ition preceded improvement in the stools. The istence of the stools improved rapidly, but frequency often persisted for 3 or 4 days, and they ined bulky and curdy for about 7 days. In cases e constipation developed after the administration of tomycin no increase in toxæmia was observed, in adistinction to that seen where diarrhœa is relieved chalk and opium.

hen streptomycin was given by mouth as described; was a rapid fall in the number of organisms in ut. In most cases a stage was reached, usually lasting few hours but occasionally for several days, when no th could be obtained aerobically from the stools. If *lgaris* was present it sometimes disappeared from the s in as short a time as 4 hours. Preliminary investiga- (by a method to be described elsewhere) showed the streptomycin content of the stools could be igh as 1·5–2 mg. (1500–2000 units) per ml. Then intestinal flora was gradually re-established, *Strep. fæcalis* often reappearing first and sometimes persisting in pure culture for several days.

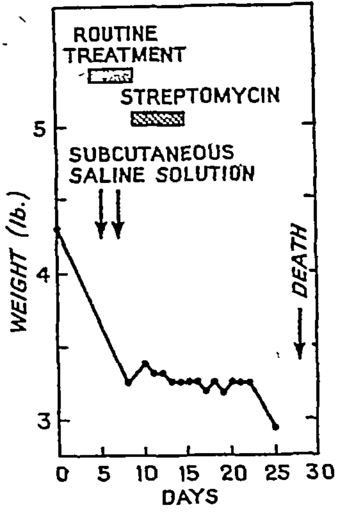


Fig. 9—Weight changes in case 16 (group C), not responding to routine treatment and given streptomycin by mouth. There were large amounts of blood in the stools.

It is important to bear in mind the possibility that organisms not usually present in the gut may become established there while the normal organisms are absent. One of us (I.R.H.K.) investigated the case of an infant given streptomycin by mouth who collapsed suddenly and died on the 3rd day of treatment. Cultures taken from the terminal ileum post mortem gave a pure growth of a streptomycin-resistant coagulase-positive *Staph. aureus*. The infant had a *Staph. aureus* conjunctivitis when streptomycin therapy was started.*

Vomiting ceased in most cases after the first dose of streptomycin, and the appetite improved early in the course of treatment. This early cessation of vomiting is one of the greatest assets in the use of streptomycin in gastro-enteritis.

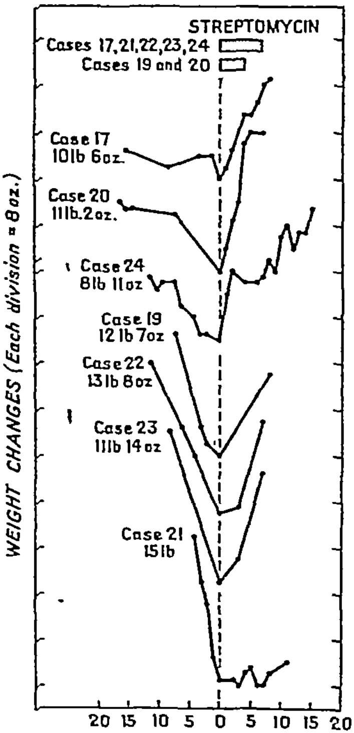


Fig. 10—Weight changes in 7 patients (group C) aged 3-5 months, not responding to routine treatment and given streptomycin by mouth.

Milk feeds were well tolerated when the child was having streptomycin, and it will have been noted that in the patients critically ill on admission to the Children's Unit, where streptomycin was given on the day of admission, feeds were given on that day at the level of 100 calories and increased by 100 calories a day. It is probable that, if cases were treated with streptomycin at the onset of gastro-enteritis, starvation could be safely omitted and generous feeds given throughout the illness.

Jaundice developed in five cases during routine treatment. It was most severe in case 15, when it lasted for 17 days, fading on the 4th day of the streptomycin course. All five patients recovered.

Stay in Hospital.—From the time that streptomycin was given, the patients' stay in hospital was very short. Most of them were fit to leave in 9–14 days, even in the most severe cases.

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* This case is being described in detail in a later paper.—I. R. H. K.

CASE 14, a boy aged 2 months, had two recurrences of gastro-enteritis and did not respond to routine treatment during his third attack. The response to streptomycin was dramatic: he gained 10 oz. during the week, and his stools improved after 3 days, though they were still bulky and curdy 10 days later (fig. 7).

CASE 15, a girl aged 5 weeks, was one of the earliest cases treated. She had been admitted with a history of 4 days' diarrhœa and vomiting, and during the next 5 weeks she received rigorous treatment, including intravenous therapy, but she lost 2 lb. 2 oz. in weight. Her illness was complicated by bilateral mastoiditis (treated surgically) and pyelitis. She became deeply jaundiced, and her condition was critical. Her stool cultures were negative for *P. morganii* and *P. vulgaris* and for organisms of shigella and salmonella groups. All the patients previously treated had had *P. vulgaris* in their stools, but in view of the long period over which she had been treated and the gravity of her condition it was thought advisable to try streptomycin. Vomiting ceased from the 1st day, her stools improved, she needed no further parenteral fluids, and she gained 15 oz. during the week (fig. 8).

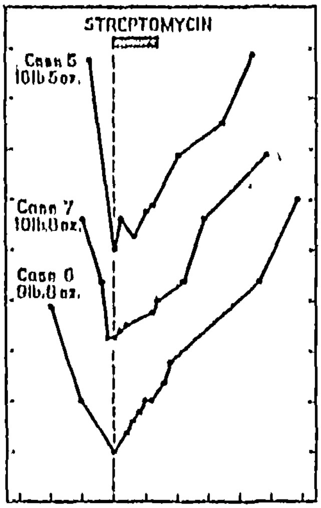

Fig. 4—Weight changes in 3 patients (group B) given streptomycin by mouth.

CASE 16, a girl aged 9 days, was admitted with 4 days' history of diarrhœa. Her stools had been frequent and fluid, and contained large amounts of bright blood. She was given routine treatment and injections of vitamin K with no improvement. Her total white-cell count at this time was 24,000 per c.mm. (eosinophils 24%). Streptomycin was then given by mouth and, though her diarrhœa and vomiting ceased and her general condition improved, she did not gain weight. She collapsed 7 days later, passed fluid stools containing large amounts of blood, and died in 24 hours (fig. 9). There had been no contact with other cases of diarrhœa, and her stool cultures were negative for all pathogenic organisms. Her father subsequently disclosed that he had had amœbic dysentery some time earlier but had not been in contact with the baby.

Necropsy (Dr. J. Bate) showed clear bloodstained fluid in the peritoneal cavity, the ileum intensely congested, and immediately proximal to the ileocæcal valve about 20 punched-out ulcers, most of them involving the mucosa only, but a few reaching the serous coat.

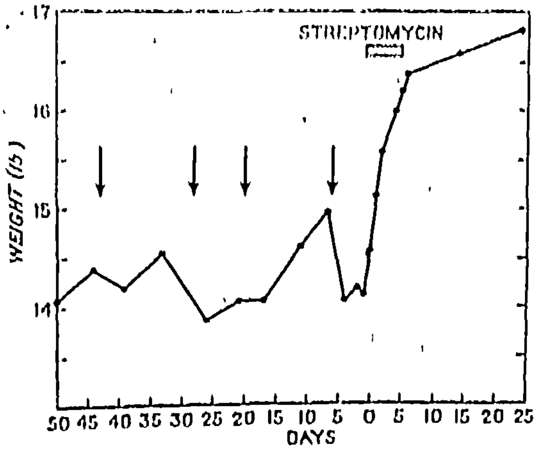

Fig. 5—Weight changes in case 8 (group B) given streptomycin by mouth: arrows indicate exacerbations.

This was the only case in the series with large of blood in the stools, but it is interesting to Loisli (1947) found this in 11 (23·0%) of hi

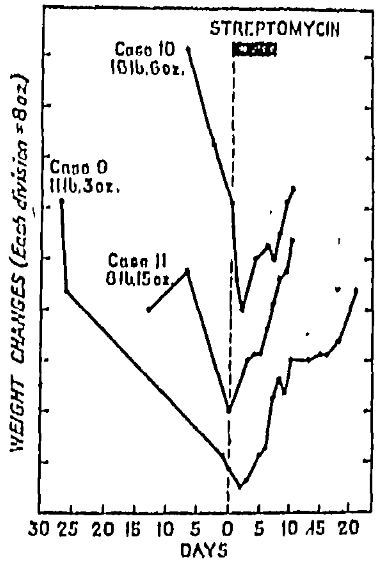

Fig. 6—Weight changes in 3 patients critically ill on admission (group C) given streptomycin by mouth.

There
patients
months.
did not
streptom
the others
well after a
response to
treatment;

CASE 17
that her
enteritis was
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8 in group
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she had
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streptomycin was given. She began to improve had no motion for 30 hours, then passed normal has continued to do so since. She was discharged having gained 18 oz. (fig. 10).

CASE 18 had had gastro-enteritis for a week, he had been admitted to another hospital. He improved and was transferred to us for tre streptomycin. Since his condition was not critical further routine treatment for another 6 days, with and he lost altogether 2 lb. 3 oz. Streptomycin by mouth, and next day a right otitis media Myringotomy was done and pus released. Five there was reddening and bulging of the left tympanic membrane, and myringotomy was done. During these 5 days he improved, the diarrhœa and vomiting lessened, and he gained 18 oz. In the subsequent 24 hours he lost 8 oz. and began to vomit again. Bilateral mastoidectomy was done, pus being found on both sides and *Bact. coli* obtained in pure culture from the right side. The patient's subsequent progress was satisfactory (fig. 11).

In case 18 the recurrence of diarrhœa and vomiting was due to the parenteral infection, and this should have been recognised and treated before streptomycin was considered. In the presence of such an infection streptomycin by mouth is valueless.

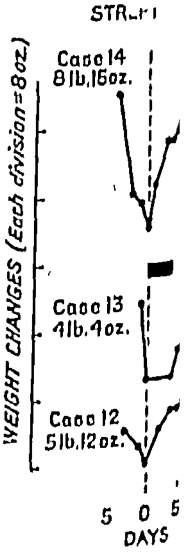

Fig. 7—Weight changes (group C) aged less th not responding to ro ment and given mouth.

There were six patients aged 6 months or more, none of whom had improved on routine treatment for a maximum of 17 days, a mini 4 days, and an average of 9 days (fig. 12 were admitted with gastro-enteritis, and one

king the square root. They are measures of
n within each group. The two mean squares are
nificantly different, and we may proceed with the
d test based on "Student's" *t*-distribution.
ference in means is 0·379, and its standard error
ated as

$$\left\{\frac{3(0\cdot04549)+22(0\cdot03011)}{25}\right\}\left(\frac{1}{4}+\frac{1}{23}\right)=0\cdot0968.$$

9/0·0968 = 3·92, on 25 degrees of freedom, a highly
nt result. If the difference in means were due
to sampling variation, and represented no real
ement, we should expect to find such a large value
than once in every 100 trials.

roup B (four streptomycin-treated cases and
ntrols) the following values were found:

value of x for treated group = 1·290.
value of x for controls = 0·631.
square for treated group = 0·12127.
square for controls = 0·01747.

o mean squares are significantly different in spite
logarithmic transformation. The usual procedure
ing the sums of the squares and calculating t
justifiable in this case, but an estimate of
ndard error of the difference in means may
en as

$$\sqrt{\frac{0\cdot12127}{4}+\frac{0\cdot01747}{8}}=0\cdot1803.$$

tio of the difference to its estimated standard
0·659/0·180 = 3·65, a value sufficiently high to
rded as significant. Such a high difference in
would arise by chance in less than 5 trials out

iew of the fact that the most serious cases were
for streptomycin treatment, we can safely say
e results indicate a real improvement in the treated

SUMMARY

ptomycin was given by mouth in thirty cases of
le gastro-enteritis. Its effects were most striking
critically ill cases, in cases of recurrent diarrhœa
miting, and in neonatal gastro-enteritis. Vomiting
early, weight was rapidly gained, the appetite
ed, the stools improved, and there was almost
iate improvement in the general condition.

ptomycin 2 g. by mouth in 7 days was given
t producing toxic effects. It was palatable
ell tolerated, even where there had been copious
ing.

administration of streptomycin by mouth does
obviate the necessity of treating parenteral
ion, which may play a part in the causation of
-enteritis.

re is a danger that pathogens remote from
it may be rendered streptomycin-resistant by the
amount of streptomycin that enters the blood-
n.

ptomycin by mouth effectively eliminated *Proteus*
is from the stools and was also effective in cases
tro-enteritis where no pathogenic organisms were

ptomycin by mouth shortened the course of gastro-
tis to a considerable extent, the usual time of
rge from hospital being 9–14 days after the start
atment, even in the very severe cases. This is a
asset in alleviating the pressure on beds and
ing the risk of cross-infection.

early administration of streptomycin by mouth
tro-enteritis may make it possible to omit a period
rvation and to give generous feeds throughout the

It is not expected that all types of gastro-enteritis of unknown ætiology or those of virus origin will respond to streptomycin given by mouth.

We wish to thank the Medical Research Council's streptomycin trials committee for non-tuberculous diseases for the supplies of streptomycin: Sir Alexander Fleming and Dr. W. H. Hughes for their unfailing encouragement; the resident medical officers, nurses, and laboratory technicians who have contributed so much to this investigation; and Mr. P. Armitage for his statistical analysis.

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SURVIVAL PERIOD OF PATIENTS WITH CEREBRAL HÆMORRHAGE DYING IN HOSPITAL

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In his classical paper on sudden death Spilsbury (1917) says that cerebral hæmorrhage is rarely a cause. This statement is generally accepted, for it accords with common clinical experience. But very little seems to have been written about the duration of life after cerebral hæmorrhage has occurred. Aring and Merritt (1935), in an article on the differentiation of hæmorrhage and thrombosis, pay scant attention to this point, and Newbill (1940) is content to state that hæmorrhage is more apt to be responsible when death takes place within twenty-four hours of the onset of symptoms.

My object here is to provide information about the duration of life after spontaneous cerebral hæmorrhage, including that from the rupture of an intracranial aneurysm. This is not of academic interest only, for early differentiation between hæmorrhage and thrombosis is necessary for effective use of systemic anticoagulants, as well as in assessing the results of treatment.

My facts are taken from the clinical and post-mortem records of the General Infirmary at Leeds in the eleven years 1936–46. During this time 7057 necropsies were performed, and in 227 (3·2%) of these some form of spontaneous cerebral hæmorrhage was found to be the main cause of death. In only 205 cases was there adequate information for the purposes of this paper, but apart from this no form of selection was used:

Site of hæmorrhage	*No. of cases*	*Cases suitable for analysis*
Cerebral hemispheres	103 ..	92
Basal ganglia	47 ..	43
Brain stem	36 ..	32
Intracranial aneurysm	33 ..	30
Cerebellum	8 ..	8
	227	205

It has long been recognised that hæmorrhage may follow cerebral thrombosis after a period of a week or more, and in such cases it appears to result from an alteration in the nutrition of an arterial wall in relation to the area of softening. In this paper such hæmorrhages have been designated secondary, whereas for those in which no antecedent thrombosis appears to have been present the term primary is used.

FINDINGS

The details are set out in the accompanying table, but certain features require special comment.

Cerebral Hemispheres.—This site accounted for 45% of all cases, but no significant differences of survival time were found for different sites within the hemispheres. No patient with primary hæmorrhage who

COMMENT

Every effort must be made, when treating infants with gastro-enteritis, to exclude parenteral infection —e.g., mastoiditis. It should *be remembered that, though* for clinical purposes streptomycin is not absorbed from the gut, about 5% does enter the blood-stream, and this amount may be sufficient to render pathogens remote from the gut streptomycin-resistant, especially where there is a coincident urinary infection. We have demonstrated in one case a urinary level of streptomycin sufficient to render the infecting coliform organism grossly resistant. In such cases it might be wise to combine oral with intramuscular *administration.*

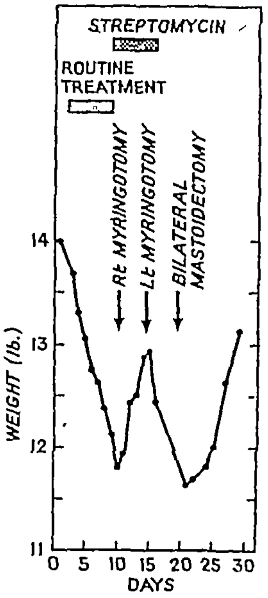

Fig. 11—Weight changes in case 18 (group C), not responding to routine treatment and given streptomycin by mouth. Bilateral mastoiditis was also present.

This investigation was started with the intention of treating gastro-enteritis associated with *P. vulgaris* in the stools, but it was found that cases with stools not containing this organism responded equally well. This experience agrees with that of Pulaski and Seeley (1948), who include among their non-tuberculous cases treated with streptomycin thirteen infants with epidemic diarrhœa of unknown ætiology. These infants were dehydrated and in shock, and they received 0·1 g. of streptomycin per lb. of body-weight daily, incorporated in their feeds, together with fluid and protein replacement. It was considered that streptomycin was the determining factor in saving at least four of the ten survivors.

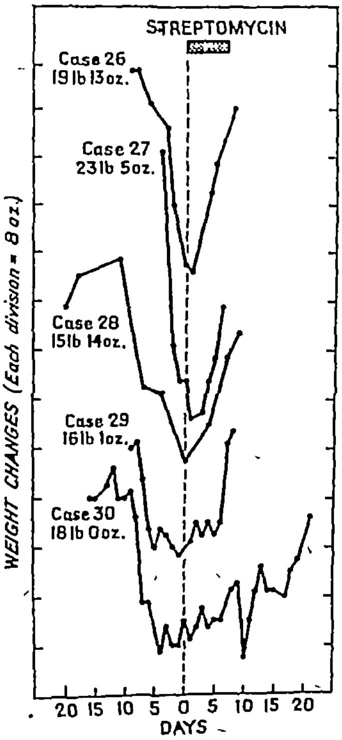

Fig. 12—Weight changes in 6 patients (group C) aged 6 months or more, not responding to routine treatment and given streptomycin by mouth.

Leisti (1947) gives an account of forty-six infants with gastro-enteritis whose stool cultures were negative; thirty-eight were full-term babies who developed gastro-enteritis when aged from 1 to 9½ months. A high proportion had blood in the stools (eight or 21%), in the vomits (seven or 18%), or in *both* (three or 8%), and of these eighteen cases twelve had been ill for less than 7 days. Streptomycin was given intramuscularly in doses of 10,000 or 20,000 *units eight times a day,* the total dosage varying from 120,000 to 8,300,000 units. Eight infants died, one did not respond to streptomycin but recovered, and two relapsed, one of whom responded to further streptomycin. The remaining eight infants were premature and developed gastro-enteritis when between 6 days and 8 weeks old. Six of these received intra*muscular streptomycin 5000* units eight times a day (total dose, minimum 80,000 units, maximum 160,000 units), and two were given 5000 units of streptomycin by mouth eight times a day (total dosages *110,000* units and *140,000* units respectively). All responded but three relapsed including one who improved with further streptomycin. Leisti concluded that the use of streptomycin is advantageous in diarrhœa of infants, and that in severe cases it often leads to a rapid recovery and a steady weight gain.

Most likely, however, there are types of infective gastro-enteritis of infants which will not respond to streptomycin given by mouth, and among these will probably be those of virus origin.

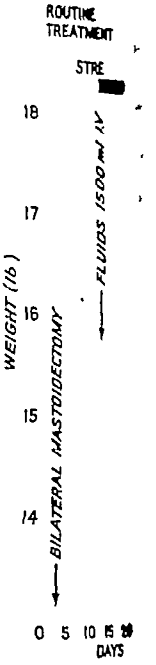

Fig. 13—Weight cha case 25 (group C responding to treatment and tomycin after mastoidectomy.

GAINS IN WEIGHT OF STREPTOMYCIN-TREATED PATIENTS AND OF CONTROLS

(P. ARMITAGE)

In groups A and B, where it was possible to observe the progress of several other cases of gastro in the same outbreaks as those from wh streptomycin-treated cases were drawn, the weight gain from the lowest weight to the *weight reached before illness in* streptomycin cases and in controls have been compared.

The trials of streptomycin in these two were not strictly controlled, since cases were not at random or alternately to the treated and groups. Since, however, the cases which wer streptomycin were chosen as being the more we *shall err in the right direction* in testing there is a significant improvement in the rate of in weight in the treated groups. There was no difference between the mean maximum weights before illness in the treated and control groups outbreak.

In each of the two series the streptomycin group showed not only a higher *mean rate* but al greater variation about the mean than the Since the usual statistical test for the difference the means of two groups is of rather doubtful when there is a considerable difference betwe variations within the groups, it was thought ad to transform the criterion to the logarithm of the *increase in weight. This transformation* tends to this sort of discrepancy. For convenience in prese each logarithm was increased by unity, and th variable has been denoted by x.

In group A (four streptomycin-treated cas twenty-three controls) the following data were ob

Mean value of x for treated group = 1·152.
Mean value of x for controls = 0·773.
Mean square (or variance) for treated group = 0·01
Mean square (or variance) for controls = 0·03011.

The mean squares are obtained by summing the of deviations from the mean of each group, divi one less than the number of observations in the o far as the weight of the heart post mortem is of as an indication of hypertension during life, s no striking association between heightened blood-re and cerebral hæmorrhage, save in the one small mentioned above.

fact that as many as 10% of fatal cases of cerebral rhage may not show free blood in the subarachnoid does not appear to be generally appreciated.

ther point is the clear-cut difference between y and secondary cerebral hæmorrhage as defined ; this would obviously be of some significance substantial series of cases of cerebral throm-were submitted to treatment with systemic gulants.

SUMMARY

clinical and necropsy records of 205 unselected of cerebral and cerebellar hæmorrhage, including ranial aneurysm, in patients dying in hospital, examined to determine the average duration of ter the onset of symptoms.

shortest time before death took place was two and over 80% of patients were dead within y-four hours.

morrhage into the brain stem and massive rupture intracranial aneurysm were associated with the st survival period, while hæmorrhage into the llum had the longest.

re was no evidence that cardiac hypertrophy was ally frequent save in cases of subarachnoid rrhage due to ruptured aneurysm in persons over ars of age.

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ETERMINATION OF HÆMOGLOBIN

PRECISION OF COLORIMETRIC METHODS

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HE reliability of different colorimetric methods of mating hæmoglobin has been examined by Macfarlane al. (1948). Most of these methods were in common lical use. Included in this survey were early models a "grey-wedge photometer" which showed consider-e promise and has since been developed.* A prelimi-y account of its construction has already been blished by King (1947), and it is hoped to provide e details in a later communication. In a similar estigation to be described here, the reliability of urate instruments for measuring light absorption been compared, the grey-wedge photometer being luded. Several derivatives of hæmoglobin have been ted with the object of finding the most suitable for lical and laboratory use.

Blood samples from 11 male and 10 female normal lts have been examined in these experiments. Hæmo-bin determinations by means of iron analyses, oxygen pacities, and carbon-monoxide capacities were carried t on all the bloods. With these values as a standard of reference, various hæmoglobin derivatives were tested in the most precise instruments available, and the results compared with those obtained with the grey-wedge photometer.

APPARATUS

VISUAL INSTRUMENTS

Duboscq Colorimeter used as Photometer.—The instrument used was a Leitz two-stage compensating colorimeter illuminated with a mercury-discharge lamp. A grey screen (density 1·0) was inserted on one side of the instrument and the solution on the other. The field was viewed through an Ilford mercury green (807) filter, and several readings were taken with the screen first on the left side and then on the right side of the instrument, the solution depth being adjusted until a match was obtained. In this way the instrument was used as a photometer as described by King et al. (1937). The illumination was almost monochromatic, and the viewing conditions were considered the best obtainable.

Autenrieth Wedge Colorimeter.—The models used were manufactured by Hellige, of Freiburg, and were used with those procedures for which a standard solution can be made. Hollow glass wedges were filled for each set of experiments with the standard solutions and sealed off. The test solution was contained in a 1 cm. glass cell.

Autenrieth Colorimeter as Photometer.—The Autenrieth colorimeter is readily adapted for use as a grey-wedge photometer by the substitution of a straight neutral grey wedge for the hollow glass wedge. Grey wedges of the appropriate size were made by Messrs. Ilford with an optical density range of 0–1·2 D. A light filter (Ilford mercury green or spectrum green) was placed in the eye-piece. The instrument was similar in design and operation to the annular grey-wedge photometer described below.

N.P.L. Colour Comparator.—The instrument, which was used to determine the strengths of the carboxyhæmoglobin solutions on the Haldane scale, is essentially the same as that described by Donaldson et al. (1943). Light from a single lamp is reflected by two white screens along two paths, in one of which is the specimen tube which can be interchanged with the B. S. Haldane standard tube; in the comparison path is a movable hollow wedge filled with carboxyhæmoglobin. The two beams are then viewed in a Lummer-Brodhun photometric field of about 15° angular subtense at the eye. Brightness variation in the comparison field is obtained by rotating one of the white screens. In operation the wedge is moved until there is a colour match first with the standard and then with the specimen which takes its place. From the wedge settings and gradient the concentration of the specimen is obtained as a percentage of the standard. Since some blood samples are slightly browner than the B.S. standard tubes, a movable pale-green wedge is provided on the comparison side to compensate for the abnormality and enable an accurate colour match to be made.

Grey-wedge Photometer.—Two beams of light pass through a diffusing screen and a monochromatic light filter; in this case an Ilford mercury green (807) filter was used. The beams then traverse symmetrical paths through the photometer to illuminate adjacent optical fields viewed with an eye-piece. One beam passes through, and is strongly absorbed by, the coloured solution contained in a 1 cm. glass cell; the other beam passes through a segment of the annular grey wedge. Both optical fields are therefore illuminated with green light, and a brightness match can be obtained by rotating the wedge and so altering the segment of the wedge in the beam. The "photometric end-point" or match may be approached from either side—i.e., from darker to lighter as well as from lighter to darker—and by rotating the grey wedge back and forth over the "end-point" an accurate match can be obtained. During matching the photometer is held squarely in front of a brightly illuminated window or a strong electric light. The circular grey wedge (0–1·2 D) is mounted in a metal holder whose circumference is marked in divisions.

PHOTO-ELECTRIC INSTRUMENTS

N.P.L. Spectrophotometer.—Spectral absorptions were determined on the spectrophotometer at the National Physical Laboratory. The main features of the instrument are as follows. (1) A double monochromator system: the second spectroscope serves as a stray light filter to improve the spectral purity of the emergent monochromatic light. (2) A potassium vacuum-emission photo-cell with valve amplifier is used as detector. The potential drop across a high grid leak is

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t is expected that this instrument will soon be available commercially.

ANALYSIS OF 205 CASES OF FATAL CEREBRAL HÆMORRHAGE IN PATIENTS WHO DIED IN HOSPITAL

Site of hæmorrhage	No. of cases	Sex		Age (years)		Survival		No. of cases in which heart weighed over 12 oz.		No. in
		M.	F.	Range	Average	Range	Average	M.	F.	
Cerebral hemispheres:										
Primary	65	57	35	22–83	57	2–96 hr.	17 hr.	27	9	
Secondary	27					7–16 days	12 days			
Basal ganglia:										
Primary	40	25	18	31–81	58	3–90 hr.	21 hr.	12	5	
Secondary	3					9–13 days	11 days			
Brain stem	32	19	13	43–79	56	2–72 hr.	14 hr.	7	5	
Aneurysm:										
Massive hæmorrhage ..	19	18	12	21–72	46	3–40 hr.	12 hr.	11	5	
Repeated hæmorrhage	11					4–15 days	11 days			
Cerebellum	8	*5*	*3*	*52–76*	*61*	*8–90 hr.*	*46 hr.*	*2*	*0*	
Total ..	205	124	81	21–83	55	—	—	59	24	

died in hospital survived longer than four days, and the total number of cases (65) is sufficient to make this finding probably significant. In the secondary group no death occurred before the seventh day after clinical thrombosis. Thus between primary and secondary cases there is as striking a difference in the time of death as there is in the underlying pathology.

Basal Ganglia.—In this site the main factor influencing prognosis is whether or not rupture into a ventricle takes place, a point that is made by Newbill (1940). In the 6 cases in which this did not happen the duration of survival averaged fifty-four hours, whereas the remainder are left with an average of fifteen hours.

Brain Stem.—Many examples of minor degrees of hæmorrhage in this site were noted in association with the larger and presumably earlier lesions seen in the hemispheres or the basal ganglia; but these are not included in this group. There are two examples of hæmorrhage into the brain stem without rupture into the subarachnoid space, and in these the duration of survival was sixty-two and fifty-four hours; if these are excluded, the average for the group falls to eleven hours, the least time of survival of all.

Intracranial Aneurysm.—This is the only form of cerebral hæmorrhage that has received much attention in the recent literature, and it is included in this paper because clinically, and occasionally at necropsy, it is *impossible to differentiate it with certainty. Some* aneurysms are indeed intracerebral in their site of rupture (Richardson and Hyland 1941), and in this series *it is possible that some of the cases in younger subjects* in which hæmorrhage into a hemisphere was found in the absence of cardiovascular disease may really belong to this group. There were 6 such patients under the age of 35, but in none of them is there any evidence of special search for an aneurysm having been made. The age range within the group is not quite so wide as in most published series, but Garland (1932) found a range of 11–80 years in a series of 32 cerebral aneurysms culled from the records of the same hospital at an earlier date; the average age of his patients is much the same as here—48 years as against 46 years. The difference in average age between this group and the cases of fatal hæmorrhage from other sites is not statistically significant.

In 16 of the 30 cases in this group the age was 45 or over, and it is a striking fact that in no less than 15 of these the heart weighed 12 oz. (340 g.) or more. Forbus (1930) has drawn attention to the importance of hypertension as the cause of the rupture *in many of these* cases of so-called developmental or "congenital" aneurysms of cerebral vessels, and the finding present series support his contention.

Cerebellum.—This is not a common site for and with one exception of eight hours all the lived more than twenty-four hours. The cases is too small for conclusions to be drawn.

Weight of Heart.—This has been noted at *every necropsy; it is the only available* which to assess the importance of hypertens causal factor, for in very few cases is the bloo *known before the cerebral catastrophe, and* value of any reading is open to doubt owing raised intracranial pressure which usually follow generally accepted that the upper limit for the of the heart is about 11 oz. (312 g.), and this as the criterion of normal, though it is admi a variable, sometimes considerable, amount of weighed with the heart at routine examinations. the figures were examined on this basis, in 83 of 205 cases the heart weighed 12 oz. or more. according to sex there were 59 (48%) of 124 24 (30%) of 81 females. The only hæmorrhage in there was a striking association with increased weight was in the small group *already* patients aged 45 or more who died from rupture intracranial aneurysm, of whom 15 out of 16 this association.

Blood in the cerebrospinal fluid is a sign which is for in the differentiation of cerebral hæmorrhage thrombosis, yet in this series of 205 undoubted cerebral hæmorrhage there were 20 (10%) in which blood was found in the subarachnoid space at necro In 3 *cases rupture into a lateral ventricle* had taken but the presence of clot in the iter or in the for of Munro had prevented the further escape of the The other cases in this subgroup all tended towards longer survival period as shown in the table, and cli they had been regarded as thromboses.

DISCUSSION

Rather more than 80% of patients with cer *hæmorrhage of primary type* dying in hospital d within twenty-four hours of the onset. Massive of an aneurysm and hæmorrhage into the brain are associated with the shortest average duratio survival, whereas hæmorrhage into the cerebellum the longest; in no instance did death take place in than two hours in the 205 cases. This justifies *impression of clinicians and pathologists* that cer hæmorrhage is rarely a cause of sudden death.

TABLE IV—NORMAL ADULT FEMALE BLOODS: COEFFICIENTS OF VARIATION FROM IRON ANALYSES

Methods	Place	No. of blood samples	No. of observers						
ric :				O_2 capacity		CO capacity		CO capacity after reduction	
Slyke	P.M.S.L. Cardiff	10 10	.. ..	1·05 1·23		1·86 ..		1·46 ..	
dric and photometric :				HbO_2	HbCO	Cyan-metHb	Acid hæmatin	Alkaline hæmatin	Cyan-hæmatin
wedge photometer	P.M.S.L. Cardiff Oxford	10 10 10	6 4 10	1·62 1·64 1·36	1·18 3·33 1·43	1·16	3·46 2·54 2 38	1·98 2·26 0·62	1·24 .. ..
ecq colorimeter as photometer	P.M.S.L.	10	2	0 97	2·11	1·64	2·71	1·20	3·50
rophotometer	N.P.L.	10	..	0·66	0 97	1·76	1·73	1·35	0·71
r comparator	N.P.L.	10	2	..	0·88	..	..	..	..
photo-electric colorimeter	P.M.S.L.	10	..	0·70	0·98	1·60	1·66	1·01	1·00
er absorptiometer	P.M.S.L.	10	..	1 05	2·15	2·95	3·19	1·91	3·29

luring the morning. The carboxyhæmoglobin, cyanin, and cyanmethæmoglobin colours were read later the afternoon.

visual instruments were read by several observers, umber varying from 2 to 10 (tables II and IV). To the effects of fatigue as much as possible, the us *instruments and colours* (*subject to the condition* oned above) were taken in random order. As a e, each observer read each colour in each instru-5 times, and in the case of the Duboscq colorimeter observer made 5 readings with the test solution on de and 5 with it on the other. Thus 20–50 separate tions were available for calculating the mean g of any colour in any visual instrument.

RESULTS

ase-line" *Results.*—The hæmoglobin concentra-of the various blood samples, derived from the s of the iron and gasometric analyses, are termed e-lines." These figures are considered the most mental estimates available of the hæmoglobin ntrations and are used therefore as standards st which the precision of the instrumental results be assessed. Tables I and III give the base-line s for the male and female blood series, each value the mean of duplicate and sometimes triplicate yses. In general the results calculated from oxygen carbon-monoxide capacities are 2–3% lower than e derived from iron analysis, though preliminary ction raises the carbon-monoxide capacity until it lmost equivalent to the latter. This discrepancy is ussed by King et al. (1948).

nstrumental Results.—One object of these experiments to determine which of the colorimetric hæmoglobin hods would reflect most accurately the precision e-line analyses. The reliability of any colour, however, ffected by many instrumental factors, and it was efore necessary to test each hæmoglobin derivative he several instruments. The scatter of individual dings in various instruments has already been reported cfarlane et al. 1948), and information on this is not narily sought. Of more interest was the "true ding" of the instrument, which in the case of photo-tric instruments is the actual reading obtained. For ual instruments the mean of the 20–50 readings ained by the several observers was considered the ue reading."

he data obtained, then, consisted, for each derivative asured in any instrument, in a series of "true readings" responding in each case to the accurate hæmoglobin erminations by the base-line methods. The quotients obtained by dividing the "true reading" by the corresponding hæmoglobin concentration were, with an accurate instrument, substantially constant, and the degree of constancy furnished a measure of the reliability of the instrumental "true readings." At first each of the different base-line methods was used to obtain such a series of quotients, but it very soon became apparent that the quotients obtained by using the results of the iron analyses were significantly lower, and varied less, than those derived from the gasometric methods. For this reason it is thought that iron analysis furnishes a more accurate base-line method than does any other available method, and all results presented here are calculated from quotients which have as denominator the hæmoglobin concentration obtained by iron analysis.

Each series of quotients was reduced to standard form by calculating first its standard deviation and then the Pearson coefficient of variation, defined as the standard deviation (σ) expressed as a percentage of the mean (M) —i.e., C.V. $=100\sigma/M$ (tables II and IV).

Quotients were similarly formed on the results of the gasometric base-line methods, and the coefficients of variation so obtained are also given. They enable a

TABLE III—NORMAL ADULT FEMALE BLOODS: COMPARISON OF GASOMETRIC METHODS WITH IRON ANALYSES

(All results are expressed as g. of Hb per 100 ml. of blood; conversion by means of Hüfner factors)

Blood no.	Iron analysis	Gas analysis			
	$TiCl_3$ titration	Van Slyke O_2		Van Slyke CO	Van Slyke CO after reduction
	P.M.S.L.	P.M.S.L.	Cardiff	P.M.S.L.	P.M.S.L.
1	16·04	15 42	15·59	15·19	15·85
2	13·98	13 45	13 85	13·18	13·82
3	12 93	12·47	12·71	12·74	13·04
4	13·49	12 89	12 99	12·94	12·95
5	12 43	12·17	12·29	12·27	12·26
6	12·94	12·77	12 84	12 65	12·73
7	12 29	12·04	12·22	12·11	12·25
8	11·81	11 53	11·77	11·60	11·70
9	13 80	13·34	13 63	13 36	13·49
10	13 63	13·20	13·27	13·13	13·18
Average	13·33	12 93	13·11	12·92	13 13

TABLE I—NORMAL ADULT MALE BLOODS: COMPARISON OF GASOMETRIC METHODS WITH IRON ANALYSES

(All results are expressed as g. of Hb per 100 ml. of blood; conversion by means of Hüfner factors)

Blood no.	Iron analysis		Gas analysis				
	$TiCl_3$ titration		Van Slyke O_2			Van Slyke CO	Van Slyke CO after reduction
	P.M.S.L.	Oxford	P.M.S.L.	Cardiff	Oxford	Oxford	Oxford
1	15·31	15·24	14·86	..	..	15·12	15·30
2	16·39	16·38	15·88	..	16·00	16·28	16·43
3	15·66	15·89	15·33	..	15·32	15·49	15·98
4	15·63	15·51	15·01	15·00	14 98	15·31	15·75
5	15·36	15·19	14·95	15·08	14·88	15·03	15·40
6	16·15	16·22	15·50	15·74	15·57	15·78	16·28
7	17·25	17·19	16·69	16·71	16·82	16·97	17·20
8	16·72	16·57	16·25	16·41	16·48	16·42	16·64
9	15·48	15·28	15·20	15·08	14·94	15·14	15·29
10	14·98	14·59	14·56	14·40	14·55	14·55	14·81
11	17·12	16·65	16·56	16·49	16·33	16·79	17·09
Average	16·00	15·88	15·53	..	..	15·72	16·02

measured on a potentiometer to give the amount of light on the photo-cell. (3) Light from a battery-operated car headlamp is focused on the entrance slit. The output of the lamp remains constant to within 0·05%.

Photo-electric Colorimeters.—The King (1942) single photo-cell instrument was equipped with an optical glass cell of 1 cm. depth, a 4 mm. Chance OGR I glass light-filter, and a Tinsley 4500 H galvanometer. A Hilger Spekker absorptiometer was used with Ilford spectrum yellow-green light filters. These instruments were used at the Postgraduate Medical School of London.

OTHER APPARATUS

Spectrographic Instrument.—In one series of experiments spectral curves were obtained at Oxford with the Hilger medium quartz spectrograph.

Gasometric Apparatus.—The standard Van Slyke and Neill (1924) manometric apparatus was used at the Postgraduate Medical School of London, at Cardiff, and at Oxford, and, in addition, Warburg manometers were used at the P Medical School of London.

Glassware.—Standard volumetric flasks of "A" q were used. The calibrations were checked by weighing and filled with distilled water. Ostwald-Folin p calibrated by weighing "to contain" were used fo measurement of all blood samples; errors in the deli such a viscous fluid were eliminated by rinsing the into the receiver with distilled water. For other o standardised delivery pipettes were used.

METHODS

All specimens were taken by one of us (R. G. M.) Radcliffe Infirmary, Oxford. A tourniquet was to the upper arm, a 16-gauge needle inserted i antecubital vein, the tourniquet removed, and allowed to pass through a short rubber tube into a containing mixed potassium and ammonium o The donors were healthy males and females aged about 300 ml. was taken from each subject. thorough mixing, and with precautions to avoid errors, the blood was divided into three parts and in screw-cap bottles, whose caps, lined with 'Cello were tightly screwed on. Bottles were then di by mail to London and Cardiff and were received first delivery next morning. Analyses in these lab were therefore begun about twenty-four hours after blood had been taken; those at Oxford were com on the day the blood was taken.

"*Base-line*" *Methods.*—At the Postgraduate Medical of London, titanous-chloride titrations of the iron con residues after dry ashing were carried out according analytical procedure of Delory (1943) as modified by al. (1948). At Oxford Klumpp's (1934) method was u gasometric methods described by Peters and Van Sly were followed in all samples. All these methods, toget the Warburg-manometer technique of oxygen capacit been fully discussed by King et al. (1948). In all c results of these "base-line" analytical methods w verted into hæmoglobin concentrations by means of (1894) factors—i.e., hæmoglobin contains 0·334% iro of hæmoglobin = 1·34 ml. of oxygen or of carbon mon

Colorimetric Hæmoglobin Methods.—Oxyhæmoglob oxyhæmoglobin, cyanmethæmoglobin, acid hæmatin, hæmatin, and cyanhæmatin were prepared ex described by King and Gilchrist (1947) and by M et al. (1948).

Time of Reading Colours.—The oxyhæmoglobin, hæmatin, and alkaline-hæmatin colours are preferal at a definite time after their formation; they were th

TABLE II—NORMAL ADULT MALE BLOODS: COEFFICIENTS OF VARIATION FROM IRON ANALYSES

Methods	Place	No. of blood samples	No. of observers	—				
Gasometric:				O_2 capacity		CO capacity		CO capa after red
Van Slyke	P.M.S.L.	11	..	1·12		..		..
	Cardiff	8	..	1·05		..		..
	Oxford	10	..	1·00		0·63		1·32
Colorimetric and photometric:				HbO_2	HbCO	Cyan-metHb	Acid hæmatin	Alkaline hæmatin
Grey-wedge photometer	P.M.S.L.	8	6	0·61	0·82	1·09	0·76	1·56
	Cardiff	6	4	1·46	0·77	..	1·61	1·07
	Oxford	5	10	0·85	0·69	..	0·42	2·95
Duboscq colorimeter as photometer	P.M.S.L.	11	3	2·97	2·03	1·68	1·72	2·40
Autenrieth colorimeter	Oxford	5	10	..	0·91	..	1·35	..
	Cardiff	6	4	..	1·59	..	1·59	..
Autenrieth colorimeter as photometer	Oxford	5	10	..	1·10	..	0·72	3·46
	Cardiff	6	4	..	1·20	..	1·65	..
Spectrophotometer	N.P.L.	10	..	1·45	1·26	1·25	1·68	2·56
	Oxford	11	..	1·65	..	..	..	
Colour comparator	N.P.L.	10	2	..	0·78	..	..	..
King photo-electric colorimeter	P.M.S.L.	11	..	1·89	1·47	1·39	1·56	0·45

EXPLAINED THROMBOSIS OF THE INTERNAL CAROTID ARTERY

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e following case the sudden onset of coarse neuro- signs followed by eighteen months' gradual ement suggested cerebral vascular disease, and graphy demonstrated thrombosis of the internal artery.

CASE-RECORD

hly built woman, aged 26, was admitted on Jan. 16. omplaining of difficulty in speaking. There was relevant in her family history. Since the age of 1 year been treated for a concomitant squint of the left eye. a routine examination for this condition in 1939 it n noted that, unknown to the patient, the eye had blind. Apart from this she had been well until 1945.

ug. 13, 1945, while serving in the A.T.S., she had got ng perfectly well. After dressing she tried to move a r, felt a sudden weakness in the right arm, and fell ground, without losing consciousness but unable to She was taken to the casualty reception centre and bed. On that day she tried to write but was unable the words. At that time she began to have sharp g left temporal headache, radiating to the frontal There was anorexia but no nausea or vomiting. On d day she suddenly developed weakness in the right

e end of September, some six weeks after the original , she began to write and read, though she had difficulty ng words when writing and in understanding words ading. Power gradually returned to the right arm and d by mid-October she was allowed up, and fourteen er she could walk half a mile without distress. Though turned to her right arm, she was unable to perform er-to-thumb test accurately with her right hand. By d of October she had lost the distressing headaches had come on intermittently during the previous two s. Improvement continued until December, 1945, he was invalided from the Service.

r this there was gradual improvement in the aphasia. ll had difficulty in speaking owing to an inability to find and remember them. Reading was also difficult, since ld not understand some of the words in the text, but ability was much less than previously and gradually sed. She was not troubled with further headaches. re was only slight residual disability of the arm and e right hand "felt clumsy" but she could do household , knit, sew, and write. If she walked much, her right foot came clumsy.

ination.—She was alert and coöperative and tended the light of her illness. There was a moderate aphasia, difficulty in finding words. She had difficulty also in standing what was said. She could read and spell words the text, but some of them she could not understand. re was slight nystagmus, greater on looking to the right. ight incoördination of the right arm, the finger-to-nose test performed rather clumsily. Her gait was steady. here was no sensory disturbance or loss of power in the . The cranial nerves were normal. The tendon-jerks present but perhaps a little more brisk on the right the abdominal reflexes were present in all quadrants. he plantar response was flexor on both sides.

nd movements at 3 ft. and light could only be appreciated e left eye. The visual field in the right eye was full. The of both eyes appeared normal, and no abnormality of optic disc or of the vessels of the left eye was detected. e heart was normal on both physical and electrocardio- ic examination. Blood-pressure 116/70 mm. Hg. Pulsa- was normal in the radial, anterior tibial, posterior tibial, dorsalis pedis arteries. There was no evidence of temporal itis. There was no pulmonary lesion. The blood rombin-time was 90% of normal, and the Wassermann ion negative.

mbar puncture produced clear watery fluid under a ure of 125 mm. of water. The rise and fall of C.S.F. pressure on jugular compression was rather sluggish. C.S.F. normal on examination. Kahn test negative.

Radiography showed general thickening of the bones of the skull, particularly the inner table of the vault. The mastoid air cells and the sphenoidal and ethmoidal sinuses were normal. In the rest of the skeleton nothing abnormal was found, nor was there any calcification of blood-vessels.

Arteriography (Jan. 25, 1947).—Exposure of the left carotid vessels for arteriography showed feeble pulsation in the external carotid, but the internal carotid was pulseless. Arteriography revealed an occlusion of the internal carotid about 2 cm. above the bifurcation of the common carotid artery (see figure). Periarterial stripping was performed at the bifurcation.

Electro-encephalography (Oct. 16, 1947) confirmed the site of the brain lesion.

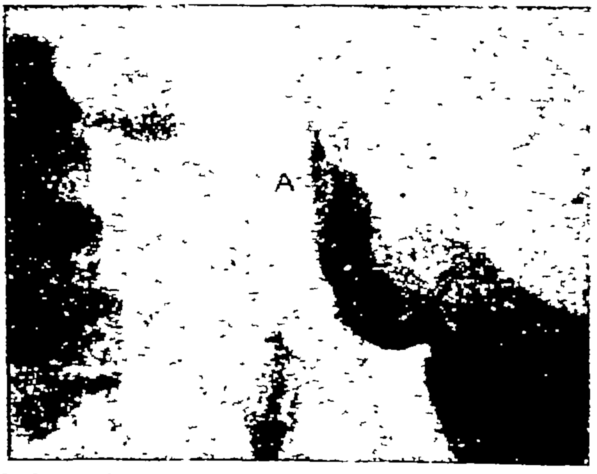
Progress.—Convalescence was uneventful. Eight months later, on Oct. 27, 1947, she was readmitted to hospital because she had become dull and apathetic, lacked initiative, and was careless of her appearance and bodily hygiene. Pneumo-encephalography showed much cerebral atrophy and asymmetry of the ventricles.

Operation (Nov. 8, 1947).—Under general anæsthesia a left superior cervical ganglionectomy was performed, and the left external and internal carotid arteries were divided between ligatures 1 cm. above and below the bifurcation of the common carotid artery. The diameter of the internal carotid artery was much reduced, and its peripheral portion appeared to be obliterated, its lumen being occluded by a firm white thrombus extending downwards into the common carotid artery and upwards into the external carotid artery for a few millimetres, partially occluding the lumina of both vessels.

Microscopical Findings.—A little proximal to the bifurcation of the common carotid artery organised thrombus filled most of the original lumen, leaving irregular channels containing fluid blood. The thrombus was attached to the intima over half the circumference of the vessel, with several gaps where fluid blood was in contact with the intima. The media was practically normal, with no obvious degenerative or inflammatory change. Close to the bifurcation of the common carotid artery the state of the external carotid artery resembled that of the common carotid artery, but the internal carotid artery had been completely thrombosed and recanalised, after which a further thrombosis had developed in one of the newly formed lumina. The media of this vessel was thin, appeared degenerate, and was penetrated by small vessels running from the perivascular region to the organised thrombus. There was only a slight inflammatory cellular infiltration in the vessel and surrounding tissues.

Further distally the external carotid artery had progressively less of its lumen occupied by the organised thrombus, whereas the internal carotid artery was almost completely obliterated throughout the length examined.

Progress.—Convalescence was uneventful, but up to Sept. 6, 1948, there had been no demonstrable improvement in the patient since operation.



Angiogram showing occlusion of left internal carotid artery: A, cone-shaped termination of opaque 'Thorotrast' column just below atlas.

comparison to be made between the reliability of gasometric and colorimetric methods of estimating hæmoglobin.

Spectrophotometric Results.—For all the samples of blood (11 male and 10 female) the spectral absorptions of each of the six hæmoglobin derivatives were measured on the N.P.L. spectrophotometer. Values were determined at each 10 mμ throughout the visible spectrum.

The coefficients of variation (tables II and IV) are based on absorption measurements at 540 and 560 mμ; detailed information on the spectral data will be reported elsewhere.

DISCUSSION

This investigation has been based on the principle used in previous work on the reliability of methods for determining hæmoglobin (Macfarlane 1945, King et al. 1944, Macfarlane et al. 1948). This is the comparison of the results obtained by several observers using the less precise routine methods with the results obtained on the same blood sample by the most precise methods available. In the present investigation some of the instruments tested were more elaborate and precise than the average routine determination of hæmoglobin requires; but their comparison with simpler procedures is instructive. For this reason the performance of two spectrophotometers, two photo-electric colorimeters, and standard visual colorimeters and photometers has been investigated in comparison with that of the small neutral grey-wedge type of photometer, which has been developed experimentally during the course of the work on hæmoglobin estimation. This last instrument, after several structural modifications, now appears to be in a form suitable for routine use and manufacture.

The validity of the base-line determinations has already been discussed in previous papers in this series, and iron analysis has again been taken as the standard of reference. It appears to provide the point of least variation from the other quantitative determinations which, in this instance, have involved several different derivatives of hæmoglobin. It will be seen that hæmoglobin mass as determined by iron analysis is very close to that derived by carbon-monoxide capacity after preliminary reduction, whereas oxygen-capacity estimations give consistently lower figures. It is reasonable to accept these two higher estimations as being the nearer to the true figure.

The variations of the results by the colorimetric and photometric methods have been calculated from the standard deviation of the ratios of observers' results to iron content of the blood samples used. Several points of interest arise regarding these estimates of reliability. The first is that, despite its simplicity, the neutral grey-wedge photometer gives results that are generally as good as those of the more elaborate and expensive instruments! Secondly, in these experiments the single-cell photo-electric colorimeter has proved more reliable than the more complicated two-celled absorptiometer. Thirdly, as regards the suitability of the various hæmoglobin derivatives for visual colorimetric or photometric estimation, it appears that oxyhæmoglobin and cyanhæmatin give the least variable results on the whole. Acid and alkaline hæmatin are inferior, though alkaline hæmatin gives good results when used in photo-electric instruments. In view of the disadvantage of cyanhæmatin for general routine use, because of the cyanide used, oxyhæmoglobin appears to us to be the derivative of choice for the neutral grey-wedge photometer. It not only gives good results but also is the simplest pigment to prepare.

Estimates of the reliability of the different methods, when used in different laboratories, are fairly consistent, apart from an occasional discrepancy. There seems, however, to be a curious difference between the results on blood samples from males as opposed to females. The latter show a greater over-all variation, particularly with certain pigments, such as acid hæmatin. N
for this can at present be given.

The constancy of the relationship between
concentration and instrumental reading in the
the grey-wedge photometer indicates the p
of calibrating the scale of the instrument
hæmoglobin values may be directly obtained.
information on this point is in course of pr

It seems, then, that the grey-wedge ph
capable of accurate results when enough
obtained by several observers. To be satisfac
it is essential that the scatter between the
different observers, each taking only a few
should be small. This point was covered by
et al. (1948), who showed that this scatter was,
when using oxyhæmoglobin, smaller than that
the hæmoglobinometers tested. It is therefore
that the grey-wedge photometer should provide
venient clinical hæmoglobinometer of
accuracy.

SUMMARY

The results of experiments to test the
precise colorimetric methods of estimating h
are described.

Samples of normal blood from 11 male and 10
adults were used.

Tests of six hæmoglobin derivatives ind
oxyhæmoglobin and cyanhæmatin give the most
results. The performance of a new neutral
photometer of simple construction compares
ably with that of standard photo-electric and
instruments.

This investigation has been carried out for the
Research Council's subcommittee on analytical
The expenses incurred were partly defrayed by
the Medical Research Council, to whom grateful
ment is made. Our thanks are due to Sir Charles
F.R.S., chairman of the subcommittee on analytical
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Hoffler, Miss P. Quelch, Mr. W. Weedon, Dr. Q.
Dr. A. Ferreira, Mr. D. B. Amos, Mrs. Olive H
many patient and willing observers for their val
tance. The colour and spectral-absorption m
were carried out in the Light Division of the Nation
Laboratory on behalf of the Medical Research C

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"... At hospital we see large numbers of physi
surgeons and regard illness as being natural to e
We fail to realise how ill-health strikes an ordinary
and there is a tendency to grow callous. ... The
patient goes into hospital once or twice in a lifetime.
arrive at the apex of the crisis of their life. Many
are full of fear when going into hospital and we may
this difficult to understand; most patients know
hospitals except perhaps that their mother or father
there. ... It is only by having an intense interest in
patients you handle that gradually you acquire the
to assess the degree of illness. ... The more interested
in people the more efficient we shall be in judging th
of health and their mentality. People can always be
more efficiently if you know something about them. ..
Dr. HORACE JOULES, addressing the Institute of C
Ambulance Personnel, March 24, 1948.

EXPLAINED THROMBOSIS OF THE INTERNAL CAROTID ARTERY

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e following case the sudden onset of coarse neuro- signs followed by eighteen months' gradual ement suggested cerebral vascular disease, and graphy demonstrated thrombosis of the internal artery.

CASE-RECORD

ghtly built woman, aged 26, was admitted on Jan. 16. omplaining of difficulty in speaking. There was relevant in her family history. Since the age of 1 year been treated for a concomitant squint of the left eye. a routine examination for this condition in 1939 it en noted that, unknown to the patient, the eye had blind. Apart from this she had been well until , 1945.

ug. 13, 1945, while serving in the A.T.S., she had got ng perfectly well. After dressing she tried to move a ox, felt a sudden weakness in the right arm, and fell ground, without losing consciousness but unable to She was taken to the casualty reception centre and bed. On that day she tried to write but was unable the words. At that time she began to have sharp g left temporal headache, radiating to the frontal There was anorexia but no nausea or vomiting. On rd day she suddenly developed weakness in the right

he end of September, some six weeks after the original d, she began to write and read, though she had difficulty ing words when writing and in understanding words eading. Power gradually returned to the right arm and d by mid-October she was allowed up, and fourteen ter she could walk half a mile without distress. Though returned to her right arm, she was unable to perform er-to-thumb test accurately with her right hand. By d of October she had lost the distressing headaches had come on intermittently during the previous two s. Improvement continued until December, 1945, she was invalided from the Service.

r this there was gradual improvement in the aphasia. ill had difficulty in speaking owing to an inability to find and remember them. Reading was also difficult, since uld not understand some of the words in the text, but sability was much less than previously and gradually ved. She was not troubled with further headaches. here was only slight residual disability of the arm and he right hand "felt clumsy" but she could do household , knit, sew, and write. If she walked much, her right foot became clumsy.

mination.—She was alert and coöperative and tended the light of her illness. There was a moderate aphasia, difficulty in finding words. She had difficulty also in standing what was said. She could read and spell words the text, but some of them she could not understand. re was slight nystagmus, greater on looking to the right. slight incoördination of the right arm, the finger-to-nose being performed rather clumsily. Her gait was steady. here was no sensory disturbance or loss of power in the . The cranial nerves were normal. The tendon-jerks present but perhaps a little more brisk on the right the abdominal reflexes were present in all quadrants. he plantar response was flexor on both sides. nd movements at 3 ft. and light could only be appreciated e left eye. The visual field in the right eye was full. The i of both eyes appeared normal, and no abnormality of optic disc or of the vessels of the left eye was detected e heart was normal on both physical and electrocardio- hic examination. Blood-pressure 116/70 mm. Hg. Pulsa- was normal in the radial, anterior tibial, posterior tibial, dorsalis pedis arteries. There was no evidence of temporal itis. There was no pulmonary lesion. The blood hrombin-time was 90% of normal, and the Wassermann tion negative.

umbar puncture produced clear watery fluid under a sure of 125 mm. of water. The rise and fall of C.S.F. pressure on jugular compression was rather sluggish. C.S.F. normal on examination. Kahn test negative.

Radiography showed general thickening of the bones of the skull, particularly the inner table of the vault. The mastoid air cells and the sphenoidal and ethmoidal sinuses were normal. In the rest of the skeleton nothing abnormal was found, nor was there any calcification of blood-vessels.

Arteriography (Jan. 25, 1947).—Exposure of the left carotid vessels for arteriography showed feeble pulsation in the external carotid, but the internal carotid was pulseless. Arteriography revealed an occlusion of the internal carotid about 2 cm. above the bifurcation of the common carotid artery (see figure). Periarterial stripping was performed at the bifurcation.

Electro-encephalography (Oct. 16, 1947) confirmed the site of the brain lesion.

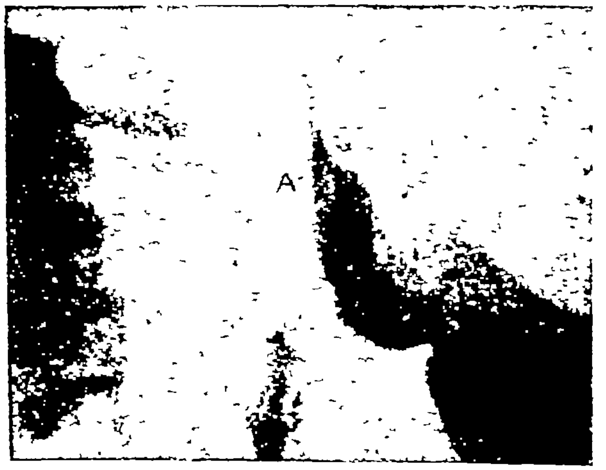
Progress.—Convalescence was uneventful. Eight months later, on Oct. 27, 1947, she was readmitted to hospital because she had become dull and apathetic, lacked initiative, and was careless of her appearance and bodily hygiene. Pneumo-encephalography showed much cerebral atrophy and asymmetry of the ventricles.

Operation (Nov. 8, 1947).—Under general anæsthesia a left superior cervical ganglionectomy was performed, and the left external and internal carotid arteries were divided between ligatures 1 cm. above and below the bifurcation of the common carotid artery. The diameter of the internal carotid artery was much reduced, and its peripheral portion appeared to be obliterated, its lumen being occluded by a firm white thrombus extending downwards into the common carotid artery and upwards into the external carotid artery for a few millimetres, partially occluding the lumina of both vessels.

Microscopical Findings.—A little proximal to the bifurcation of the common carotid artery organised thrombus filled most of the original lumen, leaving irregular channels containing fluid blood. The thrombus was attached to the intima over half the circumference of the vessel, with several gaps where fluid blood was in contact with the intima. The media was practically normal, with no obvious degenerative or inflammatory change. Close to the bifurcation of the common carotid artery the state of the external carotid artery resembled that of the common carotid artery, but the internal carotid artery had been completely thrombosed and recanalised, after which a further thrombosis had developed in one of the newly formed lumina. The media of this vessel was thin, appeared degenerate, and was penetrated by small vessels running from the perivascular region to the organised thrombus. There was only a slight inflammatory cellular infiltration in the vessel and surrounding tissues.

Further distally the external carotid artery had progressively less of its lumen occupied by the organised thrombus, whereas the internal carotid artery was almost completely obliterated throughout the length examined.

Progress.—Convalescence was uneventful, but up to Sept. 9, 1948, there had been no demonstrable improvement in the patient since operation.



Angiogram showing occlusion of left internal carotid artery: A, cone-shaped termination of opaque 'Thorotrast' column just below atlas.

er becoming irreversible (23 cases), or it may
)le from the beginning. In some cases the
ts onset is not pronounced, clumsiness of
ty only being observed. Hemianæsthesia (3
paræsthesia (2 cases), and paræsthesia of the
l arm (1 case) have also been recognised.
e cases recorded by Andrell (1943) alterations
ternal carotid artery were demonstrated, and
phasia. Though the aphasia, apart from weak-
right lower facial branch, was unassociated
neurological signs in 1 case, the remainder
ated with hemiplegia of various degrees of
he aphasia preceded the onset of paralysis
occurred at the same time in 2, and followed
s in 2. Aphasic troubles in a right-handed
thrombosis of the right internal carotid artery
been observed (Siegert 1938, Sorgo 1939,
3). The facial was the most often involved
al nerves, paresis being reported in 20 cases.
he spinal accessory (3 cases), the hypoglossal
nd the abducens (1 case) was less common.
referable to the distribution of the opthalmic
mbosis of the central retinal artery, attacks of
indness (Andrell 1943), inequality of the pupils
on the side of the thrombosed vessel (Siegert
1939), and alterations in the eye suggesting
iz 1937, Riechert 1938, Sorgo 1939) were less

sis of the internal carotid artery seems to be
d by treatment. Surgical treatment has been
the relief of spasm of the cerebral vessels.
sympathectomy, excision of the thrombosed
artery, extirpation of the cervical sympathetic,
ion of the common carotid artery with the
portion of the external and internal carotid
e all been tried. Of the 33 cases of thrombosis
nal carotid artery diagnosed by arteriography
been a gradual amelioration of symptoms in
in 3 after excision of a segment of the throm-
y. There were 7 deaths, 2 of these being due
rent infection. Neither heparin nor dicoumarol
ave been used in these cases. The history of
t case indicates that on the third day there
ad of the thrombosis. If the vascular nature
ion could have been recognised three days
lteration of the clotting-time might have
further extension of the thrombus. This
nains under observation, but treatment appears
d little effect on the course of the disease.

SUMMARY

f thrombosis of the left internal carotid artery
woman is reported. The pathology, diagnosis,
nent of 32 previously reported cases diagnosed
graphy are commented on.

lebted to Prof. F. L. Golla and Mr. Grey Walter,
en Neurological Institute, for the electro-encephalo-
ports; Prof. J. Gough, of the pathological depart-
he Welsh National School of Medicine, for the
l reports; and Prof. Lambert Rogers, director of
l unit, for advice with this case.

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INTESTINAL OBSTRUCTION FROM FIBROUS STRICTURE

FOLLOWING STRANGULATED HERNIA

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Barry described three cases of this rare condition and fully reviewed published cases.[1] Two more cases came under my care within three weeks of each other.

Case 1.—A man, aged 69, was admitted to hospital on Sept. 22, 1945, with the history that a large right inguinal hernia, which he had had for many years and for which he wore a truss, had become strangulated and been reduced by taxis by his own doctor before admission. A large tender right inguinal hernia was found, not completely reducible, and with no sign of strangulation. The patient was admitted for observation. Pain and vomiting recurred, and operation was undertaken.

First Operation (Oct. 2).—A coil of ileum 4 in. long was found fixed in the hernial sac; there were well-developed truss adhesions. No definite evidence was found of interference with the blood-supply to the gut which was therefore returned to the abdominal cavity. The hernia was repaired.

Progress.—On Oct. 8 the patient began to vomit and complain of lower abdominal pain. There was no distension of the abdomen, and flatus was passed. On Oct. 13 there was severe colicky central abdominal pain and the patient vomited several times. His bowels had not been open for two days. There was some central distension of the abdomen. The condition settled with the passage of Ryle's tube and with gastric suction. The patient was discharged on Oct. 10. He was readmitted on Oct. 30 with a history of pain across the abdomen and in the back for ten days and constipation for two days. There had been no vomiting. His tongue was furred, and his temperature and pulse-rate were normal. A step-ladder pattern of small gut coils was visible. There was much distension of the central abdomen, with tinkling peristaltic sounds. Subacute intestinal obstruction in the region of the terminal ileum was diagnosed.

Second Operation.—The ileum was much distended and contained gas and fluid. A segment just proximal to the ileocæcal junction was narrowed and indurated, with two large glands in its mesentery. The terminal section of the ileum was normal. An ileo-transverse colostomy was made.

The patient was discharged on Nov. 23 after an uneventful recovery. Seen as an outpatient on Jan. 15, 1946, he said he had had diarrhœa for six weeks after discharge but was now well.

Case 2.—A man, aged 60, was admitted to hospital on Oct. 10, 1945, with eight hours' history of colicky abdominal pain. He had vomited much brown material. His bowels had been open the day before. He had had a right femoral hernia for eight years. On admission his pulse and temperature were normal, and his tongue dry. His abdomen was a little distended, with loud tinkling noises on auscultation.

First Operation.—The femoral sac was opened and found to contain 6 in. of strangulated but viable small gut, some omentum, and some plum-coloured fluid. The contents of the sac were reduced and the hernia repaired.

Progress.—On Oct. 24 the patient complained of colicky central abdominal pain and vomited some bile. His abdomen was not distended. On Nov. 6 there were further attacks of intestinal colic, with loose motions. An anteroposterior radiogram of the abdomen did not justify a diagnosis of obstruction. On Nov. 7 the patient's temperature was 100°F and his abdomen soft. Stools showed no occult blood or pathogenic organisms. On Nov. 15 there was well-marked abdominal distension, with pain more severe. Audible peristalsis suggested obstruction of small gut.

Second Operation.—The ileum about 5 in. from the ileocæcal valve was indurated and narrow, like a rubber tube. The gut above the obstruction was much distended. The constricted segment was 2 in. long and $^3/_4$ in. in diameter, and tapered towards the ileocæcal valve. A constriction ring was still present. The related mesentery showed several

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[1] Barry, H. C. *Brit. J. Surg.* 1942, **30**, 64.

DISCUSSION

The history is characterised by the sudden onset of aphasia and weakness of the right arm followed three days later by weakness of the right leg and a subsequent gradual but incomplete recovery. Eighteen months after the original incident there was slight mental deterioration, aphasia, and remnants of a right-sided hemiplegia. Arteriography showed thrombosis of the left internal carotid artery. Subsequently a segment of the common carotid, external carotid, and internal carotid arteries on the left side was excised. The internal carotid artery appeared to be completely occluded by a thrombus extending a short distance into the common and external carotid arteries, which were partially occluded. Microscopically the walls of the common and external carotid arteries were not obviously diseased, but there was degeneration in the media of the internal carotid artery and a slight inflammatory cellular infiltration of that vessel and its perivascular tissue. The structure of the thrombus in the internal carotid artery showed that complete thrombosis had been followed by recanalisation and subsequent further thrombosis. The neurological signs suggest that extension of the clot distally took place on the third day, arterial spasm being unlikely in view of this latent period. Almost complete recovery from the hemiplegia suggests recanalisation.

The demonstrable vascular occlusion was presumably responsible for the neurological symptoms, but the cause of the thrombosis is more obscure. There was no evidence of injury whereby the vessel might have been damaged. Minute injuries due to muscular exertion, or abnormally developed fascial bands, were thought by some a possible cause of "idiopathic" thrombosis in the femoral and popliteal arteries of young men in the Services during the war. The bifurcation of the common carotid artery in the present case was abnormally high and may have rendered the internal carotid artery liable to such an injury and subsequent thrombosis. This hypothesis is only speculative, since the evidence for holding normal anatomical structures responsible for "idiopathic" thrombosis is not strong.

There was no evidence of an inflammatory process or of a tumour in either the bone or the soft tissues in relation to the artery, and nothing to indicate syphilis. Embolism is unlikely, since this girl had no sign of either valvular disease or myocardial damage. Repeated observations of the blood-pressure (116/70) did not show any significant fluctuations, and in the absence of either palpable or radiological evidence of arteriosclerosis there is little to support the assumption that either hypertensive arteriosclerosis or a sudden drop in blood-pressure was responsible.

Radiography of the skull showed a general thickening, particularly of the inner table of the vault. One reported case of thrombosis of the internal carotid artery subsequently developed Christian-Schüller's disease (Andrell 1943). Though the radiological change in the skull might be interpreted as that following spontaneous healing of a xanthomatous lesion, this diagnosis appears unlikely, since there was neither a previous history pointing to skeletal xanthomatosis nor other evidence of this condition.

It is unfortunate that there is no record of an examination of the C.S.F. when this young woman was first taken ill, for it is just possible that a "berry" aneurysm of the circle of Willis was responsible for the thrombosis. In the necropsy records of the Cardiff Royal Infirmary there is an account of a fatal subarachnoid hæmorrhage due to a "berry" aneurysm at the termination of the internal carotid; the lumen of the vessel was partially occluded by an extension of clot from the aneurysmal sac. This is the only one of 35 cases in which partial occlusion was reported, and I have been unable to find a published report of a case in which complete was found.

Thrombo-angiitis obliterans, a progressive lesion of the arteries with secondary th generalised disease of the blood-vessels and may any organ. Thrombosis of one internal ca in association with cerebral thrombo-angiiti observed (Sorgo 1939, Antoni 1941, Sunder 1941, Andrell 1943, Davies and Perret 1947). thrombo-angiitis tends to involve the smaller the hemisphere, and the affected cortex shows softening, glial scar tissue, and normal cortex encephalography in the present case showed due to atrophy. Though cerebral thrombo thought to be responsible for the thrombosis in in the absence of clinical signs of more vascular disease or a systematic examination vascular system which could only be done at the diagnosis cannot be regarded as established.

Previously Recorded Cases

Numerous cases of thrombosis of the ca have been published. Thrombosis of the c artery is rare, and bilateral thrombosis Frøvig (1946), who reported a case, found 11 similar cases. Most of the reports concern of the internal carotid artery. I have found 32 cases (Lohr 1936, Moniz 1937, Shimidzu et al. 1938, Riechert 1938, Siegert 1938, Andrell 1943) in which thrombosis was arteriographically. In these cases and in the the age and sex of the patients and the side the lesion occurred were as follows:

Age (decade) ..	3rd	4th	5th	6th	7th
No. of patients ..	1	6	4	11	10

Males 26; females 7.
Left side 23: right side 10.

Arteriosclerosis is thought by Andrell (1 responsible for the thrombosis in most cases. from 6 of the 32 cases previously described was pathologically. In 1 fatal case, Antoni (1 changes in the cerebral vessels due to thro In 5 a segment of the occluded vessel showed sclerosis had caused the thrombosis in 3, and angiitis in 2. In the remaining 17 cases was diagnosed in 7, no cause could be found vascular pathology in 7, 1 was thought to thrombo-angiitis, 1 was associated with sy was followed by Christian-Schüller's disease.

Diagnosis

The diagnosis is difficult. The duration of and their transient character in the early stage cerebral vascular disease. Pneumo-encepha provide evidence of cerebral atrophy. Precise requires arteriography.

In a little over half the cases the disease chronically progressive course, and an characterised by transient cerebral symptoms recognised. Premonitory attacks of headache most constant. The headache, localised to the the lesion, transient, and of short duration, periodically for years before the manifestation symptoms. Occasionally it is associated with disturbances or with neurasthenic symptoms. paresis, hemiparæsthesia, speech difficulties, sient blindness have been reported. These which develop in attacks of short duration and rapidly, are followed after months or years by severe attacks, the last at times being apoplectic. the cases here described, this stage may be at the first sign of the disease be the acute onset neurological symptoms, the commonest being he involving chiefly the arm. Initially this may be

CLINICAL APPLICATION

rvations seem important in several clinical which renal cortical ischæmia is probably ing pathogenic factor—namely, essential , pre-eclampsia, traumatic anuria, and For some time we have been interested in relationship between toxæmia of pregnancy hypertension, for the best results of splanch- or hypertension seem to be obtained in se disease originates in pre-eclampsia. The romes of pre-eclampsia and of eclampsia t of malignant hypertension so closely that to believe that they have not a common al cortical ischæmia, and that it is possibly factor which makes malignant hypertension hereas pre-eclampsia and eclampsia improve mination of the pregnancy. Further, it has that renin can be detected in the blood of pre-eclampsia and in those with eclampsia those with malignant hypertension. We ned our attention to patients with pre- was found that by blocking both splanchnic procaine the blood-pressure could always a normal level. The blood-pressures before anchnic block in five consecutive patients re:

Blood-pressure (mm. Hg)

0/105	150/95	190/100	160/90	195/115
0/75	100/60	130/70	110/70	170/100

was made to render the splanchnic block t alcohol was unsuitable because of the acing it sufficiently accurately and because ly followed by severe intercostal neuritis, tocaine ' was unsuitable because it diffused hen proctocaine, rendered radio-opaque by f a little iodised oil, was injected at the h and 12th dorsal vertebræ, it tracked as lumbar vertebra in forty-eight hours.

tried T.E.A.B. and found that an intra- of 0·5 g. usually produced a well-marked ary fall in blood-pressure (see figure). nsion was usually, though not invariably, ut 15 min. We then used T.E.A.B. by injection to obtain a prolonged effect, hourly for twenty-four hours followed urly for twenty-four hours. The initial ppointing. Only four cases have so far t in the last case the blood-pressure fell y-four hours after the last injection and about seven days. Probably, therefore, E.A.B. must be given for a much longer desired effect.

COMMENTS

e the answer to the problem of treatment related syndromes in which the renal narily at fault. Repeated large doses of trial in the prevention and treatment as concealed accidental hæmorrhage, d possibly blackwater fever, all of which nied by oliguria due to renal cortical

terrupted through unforeseen circum- usly incomplete, but it is hoped that y give the method a wider trial.

SUMMARY

eta et al.[1] on the presence of two alter- athways through the kidney has been tition of their experiments.

tetraethylammonium bromide on the has been studied in rabbits, and an intramuscular dose of 0·2 ml. of a 10% solution per kg of body-weight has been shown to prevent cortica ischæmia.

Intramuscular doses of 1 g. six-hourly for twenty-fou hours, followed by 1 g. three-hourly for twenty-fou hours, caused the blood-pressure to return to norma for seven days in 1 out of 4 cases of pre-eclampsia.

It is suggested that a longer period of this treatmen may have the desired effect in a greater proportion of cases.

I wish to thank my colleagues Prof. T. N. A. Jeffcoate, Mr. St. George Wilson, and others for allowing me to study patients with pre-eclampsia admitted under their care. We are grateful to Pharmaceutical Specialities (May and Baker) Ltd. for the tetraethylammonium bromide used in the animal experiments.

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Reviews of Books

Surgery of Abdominal Hernia

GEORGE B. MAIR, M.D., F.R.F.P.S., F.R.C.S.E., surgeon, Law Junction Hospital, Lanarkshire. London: E. Arnold. 1948. Pp. 408. 25*s*.

THIS book really consists of two parts—a monograph on the use of whole-skin grafts in hernia repair, and, round this, a general treatise on hernia. The first, which conveys the author's views and experience, is the best; the remainder is painstaking and impersonal, and (as always when a writer is editing the views of others rather than stating his own) is overloaded with quotations from obscure surgeons supporting bizarre theories. Lytle's masterly description of the internal ring, which agrees with those of Astley Cooper and Hesselbach, is ignored, and we find in its place a circular sphincter of muscle which was apparently seen by someone in 1929.

Mr. Mair's use of the purely Scottish word "outwith" goes with a clear style and forthright manner, and his account of his own work with whole skin will interest most surgeons. A record of 140 indirect herniæ operated on by this method with only 1 recurrence after a year, and of 40 direct herniæ similarly treated with no recurrence after three years, is one of which anyone might be proud. But while the author's advocacy and his results will persuade many surgeons to try his technique, its ultimate survival will depend on the results that others get. It is clear that the graft is eventually converted into, or replaced by, a firm sheet of fibrous tissue, but only after a battle lasting six months in which fibroblasts, foamy cells, and giant cells struggle over dead epidermis, hair fragments, desquamated elastic fibres, clumps of bacteria, and small abscesses. Clinically these struggles seem to be indicated by a local reaction greater and more prolonged than usual.

The book usefully fills a place. It will be consulted by those who want a clear account of the whole-skin graft method of repair, and by those who seek information and references in relation to rare or atypical herniæ.

Disorders of Sex and Reproduction

A. P. PILLAY, M.B. London: H. K. Lewis. 1948. Pp. 299. 18*s*.

IN former days sexual difficulties and impaired fertility were generally neglected by doctors, mainly because they were not lethal; and now their treatment has passed into the hands of the gynæcologist, the urologist, the endocrinologist, and the psychologist. This has the disadvantage that patients have to be referred from one doctor to another during the course of their treatment, and Dr. Pillay argues that it would be better for them to be under the care of a single specialist in "sexology." He has devoted himself for many years to the diagnosis and treatment of sexual and reproductive disorders in both sexes, and this book is the fruit of his varied professional experience. It gives a balanced view of forms of illness which often cause great mental distress, even though they are not the cause of serious strands of fibrous tissue, and there were several large hard mesenteric glands, one of which was taken for biopsy. The affected bowel was short-circuited by an ileo-ileostomy. The gland showed changes due to pyogenic infection, and when cultured yielded a pure growth of *Staph. pyogenes*.

The patient made an uninterrupted recovery.

COMMENTS

These patients were 69 and 60 years old. In one case signs of obstruction developed 18 days after reduction of a strangulated right inguinal hernia, and in the other between 14 and 35 days after operative reduction of a strangulated right femoral hernia. In one case necrosis of the mucosa gave rise to diarrhœa 21 days after strangulation; the diarrhœa in the other case was possibly a result of ileo-transverse colostomy. Growth of *Staph. pyogenes* from a mesenteric gland in the second case suggests that damage to the mucosa allowed the organisms to penetrate to the deeper tissues of the bowel.

Neither case showed intestinal hæmorrhage. The diagnosis of Crohn's disease was ruled out by the histories. Both patients did well after a simple short circuit of the affected part of the ileum.

I am indebted to Dr. W. Ramsay, medical superintendent of Crumpsall Hospital, Manchester, for permission to publish these cases, and to Dr. G. Stewart Smith for the pathological report.

Preliminary Communication

TETRAETHYLAMM[illegible]ONIUM BROMIDE IN RENAL CORTICA[illegible]L ISCHÆMIA

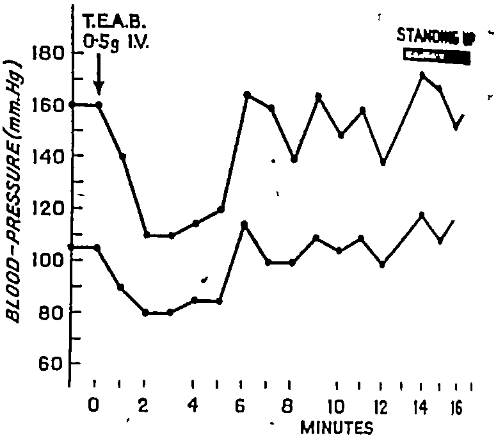
TRUETA et al.[1] have presented [illegible] new picture of the circulating pathways in the kidney [illegible] us clinical states. importance in the pathogenesis of vario[illegible] d studied the We have confirmed their observations [illegible] the renal effect of tetraethylammonium bromide [illegible] application circulation, especially as regards its possibl[illegible] pregnancy to the prevention and treatment of toxæmia [illegible] and other conditions.

Experiments were first made to inject th[illegible] o normal renal circulation. Rabbits of about 2 kg. bod[illegible]-weight which is were injected with indian ink by the technique w[illegible] ked- advocated by Trueta et al. and very satisfactory n[illegible] as eye appearances were produced. The technique i[illegible] follows:

> The mesenteric vessels are ligated, and a hypodermic nee[illegible] is inserted into the abdominal aorta just above the bifurcat[illegible] and directed against the blood-stream. The aorta is next tie[illegible] round the needle. 'Mandarin' indian ink diluted 1 in 3 is injected so that the head of the injected mass is kept just above the origin of the renal arteries. This point can be found by observing the colour of the left suprarenal gland, which becomes and remains black while the ink is kept at the correct level, but rapidly becomes pale if there is insufficient ink in the aorta.

The normal kidney injected in this way rapidly becomes uniformly black after 3 or 4 ml. of ink has been injected. The renal pedicle is next clamped, and the kidney removed and fixed in formalin for twelve hours, after which it is sectioned and photographed. The cortex of the normal kidney appears uniformly black to the naked eye.

In other rabbits faradic stimulation was applied to the left splanchnic nerve for 10 min. The surface of the kidney became pale and, when 3–4 ml. of indian ink had been injected, appeared irregularly red and black, showing that some areas of the cortex were ischæmic. If 20 ml. of ink was injected over a longer period, the cortex became uniformly black, and a cut section showed ink distributed throughout cortex and medulla, suggesting



Blood-pressure of patient with pre-eclampsia treated with T.E.A.B.

that the vascular spasm could be overcome by pressure in the renal artery.

Effect of Crushing a Limb

Observations were next made to confirm the [illegible] crushing the limb. The rabbit was [illegible] intravenous pentobarbitone sodium supplemented [illegible] open ether as required. A wire tourniquet was [illegible] to the left hind limb sufficiently tight to [illegible] circulation and crush the muscles without [illegible] them. The tourniquet was left on for $4^1/_2$–5 h[illegible] which the same injection technique was used. [illegible] found, as Trueta et al. noted, that the k[illegible] injected unevenly, the left being more patchy [illegible] right.

Effect of Splanchnic Paralysis

Trueta et al. state that the vascular [illegible] kidney depends on the integrity of the sp[illegible] and that after section of the nerve the [illegible] shunt cannot be produced. No attempt was [illegible] confirm this particular observation directly, [illegible] were interested in a more rapid method of [illegible] renal circulation—by the use of the rap[illegible] sympathetic paralytic drug tetraethyl[illegible] mide (T.E.A.B.). This was given in 10% [illegible] intramuscular injection, the dose being 0·2 ml [illegible] of body-weight.

The rabbit was anæsthetised as before, [illegible] muscular T.E.A.B. was given. A tourniquet [illegible] applied as before for $4^1/_2$ hours, and indian [illegible] injected. The injection pattern was completely [illegible] nd identical with that of a normal kidney. Th[illegible] ent was repeated in 6 rabbits with similar [illegible] ggesting that an adequate dose of T.E.A.B., [illegible] application of the effective stimulus, was as [illegible] splanchnic section in preventing the renal [illegible] mia.

as [illegible] clinical practice, however, such co[illegible] isch[illegible] ly to arise, and it seemed more important In [illegible] whether T.E.A.B. would be as effective if gi[illegible] unlik[illegible] ter the effective stimulus. The experi[illegible] mine [illegible] re repeated, and an intramuscular inj[illegible] time [illegible] was given in different rabbits one, two, therefo[illegible] ter the application of the tourniquet. T.E.A.B. [illegible] n which only one or two hours had hours [illegible] the stimulus and the injection of T.E.A.[illegible] rabbits [illegible] ulatory pattern was normal, whereas between [illegible] which a longer period had elapsed [illegible] renal cir[illegible] rtical ischæmia. It therefore seemed rabbits in[illegible] the development of renal cortical isch[illegible] usually co[illegible] E.A.B. after the application of the to prevent [illegible] despite the persistence of that st[illegible] injecting T.E[illegible] interval was not too long. stimulus, an[illegible] provided the i[illegible]

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[1] Trueta, J., Barclay, A. E., Franklin, K. J., Daniel, P. M., Prichard, M. M. L. Studies of the Renal Circulation. Oxford, 1947.

THE LANCET

NDON: SATURDAY, OCT. 9, 1948

Under Tension

ause of the present international crisis,
ld, is the antagonism of democratic and
n conceptions of government. Psycho-
the democratic and the totalitarian régimes
two different types of adjustment to gre-
ife; and each has a long history What
ential difference between them?

o types of adjustment may be contrasted
nce to the old saying "It takes all sorts to
orld." Those who can accept this exacting
prepared to find satisfaction in the thought
rs may be very unlike themselves and yet
y of respect and even affection People
an attitude of mind can tolerate, without
rain, profound divergences of outlook in
d in which they live, indeed they may
erience a relief when there is not too much
y in the cultural pattern To take an
from the political field. His Majesty's
n is accorded almost as much respect as
sty's Government, for both are loyal to the
nd both are made up of persons who represent
le; and when they are of almost equal
e have a feeling that our constitution is
e changes will not come at a speed we cannot
Other instances in this country include the
ered rivalry of religious groups, the general
of agnosticism, the easy mixing of age-
n the community, and, above all, the way
ancient institutions are adapted to present
instead of being destroyed The ideal
y is based on a conviction that the fullest
ly to be found in a diversely constituted
The totalitarian, on the other hand, holds
flict of ideas within his nation or group
rous, and his remedy for internal tension
uce everyone to think alike and behave alike
itude long antedates the Soviet and Nazi
ian states In pre-revolutionary Russia it
xpression in the oneness-of-mind which
rised the decisions of the village *mir*, in the
notion of *sobornost* (a sort of pentecostal
inspiration of the whole congregation),
political and religious self-abnegation.
diness of Russian communities to accept
nges of policy was established long before
dialectic was thought of.

two modes of adaptation to tension may be
ve cultural responses to a situation that
dividual has to deal with in his own develop-
Mental growth results from a complex of
ing impulses of love and hate and our picture
lves and the social world in which we live is
at first permeated with images of fantastically good and fantastically bad people. It is commonly reckoned an advance towards maturity when we can recognise the good-and-bad in ourselves as well as the good-and-bad in those around us: we achieve an accommodating, not over-demanding, attitude to ourselves and to others In some societies this flexible and tolerant way of social life is transferred to the community, and to those who are its symbol and executive The State is not divine, nor yet is it abhorrent

In the individual's relation to the State there is again a contrast between the democratic and the totalitarian societies; for the former have evolved a sociopolitical device by which the people, without disloyalty or disruption, can express hostility to authority. In England and the United States interest in politics is split into two. One portion is reserved for the Crown (in America for the Constitution and the Supreme Court), and discontent, however active, does not disturb it: the other portion is focused on the Cabinet, which discontent can remove from office without upsetting the fundamental relation to the central authority But totalitarian nations have no comparable device **Hitler** made himself a god to his people, and had no cabinet worth attacking. The leading one-party State of the present time, Soviet Russia, has likewise exploited the notion of an omnipotent ruler, and provides hardly any means by which people can legitimately express discontent with the policy of their government on major issues. Instead, the hostility that the rulers might incur by their shortcomings is often diverted to some external agency—a custom that menaces international harmony, by producing uncontrollable suspiciousness and a paranoid attitude to neighbours.

Another and different factor which makes the present situation dangerous is that the acquisition of great military force excites latent ambition which would otherwise lie dormant. We cannot ignore the fact that the invention and virtual monopoly of atomic weapons puts a strain on American statesmanship, and that possession of these instruments places excessive power in the hands of a minority of citizens. A nation which is by tradition democratic is thus labouring under some temptation to behave like an ambitious oligarchy—a temptation to which in the past we ourselves have sometimes succumbed, but to which at the moment we are not exposed

England today stands between two great Powers who do not understand each other, and who might each be irritated into supposing that war would bring advantage to the world If in such risky circumstances we are to justify our reputation for political common sense we should perhaps pause before committing ourselves emotionally to either side; for in so doing we should lose any remaining chance of serving as mediators. Moreover, we might run a risk of denying a principle for which our ancestors fought and died, and towards which we strive in our slow growth as individuals. Nothing is harder to remember in a time of crisis, but at no time is it more necessary to recall that it takes all sorts to make

es which follow birth, is unevenly distributed,
ust consider that our responsibilities remain
illed."

is last chapter Professor Ryle touches on a practice
as troubled many conscientious doctors—that of
ious surgical operation undertaken on a wide range
ients before its value has been assessed by adequate
logical study and by thorough follow-up of early
Operations are devised, and then studied by trial
rror, by men of limited experience as well as
ed ones. He asks whether, for example, vagotomy
soligation have yet been justified either by animal
man experiment, and whether the partial and
rary successes and the complete failures have
udicially studied and reported, as a counterweight
complete successes. He believes the answer to
questions, and others equally searching, is either
' or "We do not know." Experiments, usually
and safe, carried out on patients who are willing
eers and understand the purpose of the investiga-
re, he thinks, entirely permissible, especially if
im to decide whether a given line of treatment will
ve a patient's condition; they are harder to
if they are designed merely to advance theoretical
edge and if the patient must be persuaded to agree
n. He might have added something about the type
estigation which carries a risk, whether to life or
: cystoscopy in the partially paralysed bladder is
s a fair example. Who knows what the risks are
y? The patient does not even know that there
y, and is given no chance of deciding whether he
to take them; the surgeon usually has an
ession" about the risks in general, and an
ion" about the risks for this patient; he also has
therapy at the back of his mind as a saving measure
gs go wrong. Yet the risks, even of temporary
fort, should always be carefully weighed against
formation which the method is expected to yield.
or Ryle would like every research clinician con-
ting an experiment to ask himself three questions;
hese might well serve, too, for those undertaking
e examinations: "Would I accept that this
ment or investigation should be carried out in
r circumstances on a member of my own family?
ould I accept that it should be carried out without
ll coöperation and consent? In the presence of
iable risk, do the possible results for science or
ine help to justify the risk?"

may also ask, he suggests, that new operations
ng a danger to life or subsequent health should not
dertaken by men of limited experience before their
has been proved by others; and that methods of
-up should be much stricter, wherever possible
ding a personal interview by a trained medical
worker.

PATIENTS' READING

E International Federation of Library Associations
hospital subcommittee which met during the recent
rence of the federation in London. The discussions
led differences in various countries in the attitude
medical profession and the extent to which reading
ld to have a therapeutic value. In Denmark the
e, which is entirely staffed by professional librarians,
little if any account of the condition of the patient.
reat Britain the general attitude of doctors, with
notable exceptions, is to leave the patient an
ely free choice, though in tuberculosis sanatoria
mental hospitals there is a definite movement to
reading as a contribution to treatment. In
ce there is a good deal of difference of opinion among
cal men. In Belgium the service is admirably
nised by the Belgian Red Cross under the direction
rofessional librarians, who are encouraged to take
urse in social science. The Red Cross librarians read all the books before circulating them, and have a code to denote any risks which may attach to issuing them to particular types of patients. In some hospitals in the United States the conception of the therapeutic value of reading has reached the stage of prescribing books like medicine, and requiring a report from the librarian on the effect on the patient.

At the meetings it proved possible to obtain general agreement to a resolution that, while preserving the liberty of the individual patient, the librarian must appreciate the possible effect of the book upon him. Also approved were resolutions that public librarians should have special training for hospital work, that the voluntary workers who distribute the books should have some training, and that the attention of doctors and all concerned with hospitals be directed to the value of this work.

MECHANICAL ARTIFICIAL RESPIRATION

THE "iron lung," introduced by Drinker in the United States in 1929, and its modification the Both respirator which Lord Nuffield generously provided for British hospitals, are still saving lives which would otherwise inevitably be lost from respiratory failure. The uses found for the Both respirator have ranged from the treatment of overdosage with paraldehyde,[1] hitherto almost invariably fatal, to the prevention of post-operative atelectasis.[2] Persistent apnœa is no longer regarded as necessarily deadly in hospitals possessing a Both respirator. In other circumstances the first-aid teaching, whether in medical school, factory, or police force, is to apply manual artificial respiration by the method of Schäfer or Silvester, or by the even simpler and more efficient[3] rocking method of Eve, until the patient recovers or is transported to a hospital, which in England is never very far. In America, where Lord Nuffield's benefaction has not been emulated, and where distances are much greater, a Society for the Prevention of Asphyxial Death has for many years been stimulating interest in this subject. With their vigorous affection for up-to-date mechanical devices, the Americans have been attracted to automatic means of artificial respiration, and breathing machines have been widely distributed for use in the mine, by the canal bank, or even in the gas suicide's bedroom. Some have even been adapted to supply the airman with oxygen under intermittent positive pressure at high altitudes. There has therefore been a constant search for cheaper, lighter, and more compact apparatus which is yet sufficiently robust. Commercial competition has stimulated a variety of designs, all working on the principle of direct inflation of the lungs by oxygen under pressure. Controversy has raged for years over the relative merits of the different patterns. Motley and his colleagues[4] show that in practice all are fairly satisfactory, and that all will oxygenate the patient better than the traditional manual methods. The apparatus gradually builds up the pressure under the face mask during the inspiratory phase and allows it to fall rapidly to zero (i.e., atmospheric) at the start of expiration, so mimicking natural unimpeded respiration. Surprisingly the "suck-and-blow" machines, which inflate the chest during inspiration and also suck air from it in expiration, proved to have no advantages over the more usual patterns which only inflate. It appears that the "suck" is but poorly transmitted to the interior of the thorax.

The possibility that mechanical artificial respiration may have side-effects on the heart has hitherto been discussed largely on the basis of clinical impression. Now Motley and his co-workers have shown how very

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1. Macintosh, R. R. *Brit. med. J.* 1939, i, 827.
2. Mushin, W. W., Faux, N. *Lancet*, 1944, ii, 685.
3. Macintosh, R. R., Mushin, W. W. *Brit. med. J.* 1946, i, 908.
4. Motley, H. L., Cournand, A., Werko, L., Dresdale, D. T., Himmelstein, A., Richards, D. W. jun. *J. Amer. med. Ass.* 1948, 137, 370.

Special Articles

CAL EDUCATION IN THE UKRAINE

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HEALTH ORGANISATION, GENEVA

et Russia all medical students are trained with o occupying planned posts in a State health For example, since children constitute about a the population and their care is entirely arised," it is intended that a third of all doctors g should have some special knowledge of s. A similar arrangement holds for the other of the medical profession, but the targets are rs reached.

stem of education and the curricula are stan- throughout the U.S.S.R. In each republic all ducation is subject to supervision by the local of the Care of Health, which supplies the funds ersonnel, and the Ministry of Higher Education, anages the institutes. These ministries are o supervision by the All-Union Ministries in All professional examinations are All-Union ions, so a minimal standard is maintained ut the country, and a diploma or other qualifica- ined in one part of the country is valid in every

CATEGORIES OF MEDICAL WORKERS

d medical practitioners have received their in higher educational institutes and are classified s: medical practitioners with "broad" speciali- medical specialists with "narrow" specialisa- edical research specialists; assistants (*teaching or*); aspirants; candidates; docents; professors; of medical sciences; corresponding academicians; cians.

al Auxiliaries.—The higher institutes are respon- r the education of pharmacists, and the lower s for that of dentists (not stomatological ts), feldshers and feldsheritsas, pharmacists' ts, and medical nurses.

anitary inspectors are educated in the higher es.

ENTRANCE EXAMINATIONS

ndidate for entrance to a higher institute must tended a ten-year school for pupils aged 7–17 her hold *the silver or gold medal of that school or* e entrance examination of the institute he has The choice of profession and institute is free, dents are given every facility to meet the pro- to have the curriculum and prospects explained. a routine procedure during the last years at the r school. Special privileges are accorded to war s and children of Heroes of the Union.

ntrance examinations are held on or about the ate, and the students must surrender their birth ates and school diplomas on entry to the examina- hence it is virtually impossible for them to sit several ations in the *hope of passing one of them.*

andidate for entrance to a lower institute must ttended a seven-year school and is usually required s an entrance examination. Lower institutes are y equivalent to the technical schools in industrial ion.

FINANCIAL ARRANGEMENTS

financial arrangements are the same in principle hout the Union; only the payments vary. All its receive stipends which are sufficient to maintain and pay the very low fees. Outstanding students receive extra stipends, and the best get Stalin c prizes, which take the form of a large incremen stipends. The stipends increase from year to ye cease if the student twice fails to pass his examina

The payment of fees by the students is intende inculcate a sense of responsibility and ability to man their own budgets. Thus, the students receive stipen of 220–700 roubles a month. They have dining-rooms and dormitories, recreational and games facilities, and many other amenities, all of which are free, except for a daily charge of about 3·5 roubles for three meals a day.

Fees amount to 300–450 roubles a year, but seldom more than 60% of students pay the full fees, privileges being given to special groups.

THE MEDICAL CURRICULUM

At present the course lasts six years but it may be extended to seven in the near future.

First Year.—The subjects are Marxism-Leninism (a form of training in logic and philosophy), Latin. English, physics, biology, and parasitology; a start is made on anatomy, histology, physiology, embryology, analytical chemistry, and biochemistry.

Second Year.—Students continue with English, anatomy, histology, embryology, the chemistries, and physiology. At the end of this year is held the "half" State examination—an intermediate examination which weeds out the unsuitable students. The following subjects must all be passed at the same time, failure in one involving failure in all: (1) human anatomy, (2) histology and embryology, (3) physiology, and (4) biological chemistry. Permission to "sit" again may be obtained and students are often placed in other careers.

Third Year.—Here the "broad specialisation" begins to influence the subjects taught. The students start the study of microbiology (bacteriology), pathological physiology, pharmacology, pathological anatomy, diagnostics and "private" pathology and therapy, and general surgery. He has commenced clinical attendances in his second year (some even start in the first) and will continue these until the end of the course. At the end of this term there is an examination (not a "State" examination) and the student does his first "physician's practicum." He repeats this in the summer of the fourth year and in the fifth summer will do his "physician's subordinator"—a form of internship. These clinical periods involve about seven hours a day for at least three months.

In the *fourth year* the students really begin their specia training as general practitioners, pædiatricians, sanitary physicians, &c. There is an examination at the end of this year.

The *fifth year* sees the completion of the apprenticeship and many of the smaller subjects, such as venereal diseases, pædiatrics, tuberculosis, infectious diseases, ophthalmology, radiology, &c. The range of these is complete; there are no omissions.

The *sixth year* is more intensely clinical, finishes off the special subjects, and completes the intensive clinical studies.

The number of hours given to each subject is shown in the accompanying table.

FINAL STATE EXAMINATION

The final examination (known as the "full" State examination) always has nine subjects, every one of which must be passed at the same sitting.

A. *General Medical Faculty ("broad specialisation")*

1. Human anatomy
2. Pathological anatomy
3. Pathological physiology
4. Internal diseases (=medicine)
5. Surgical diseases
6. Obstetrics and gynæcology
7. Infectious diseases
8. Children's diseases
9. Hygiene

dependent is the cardiac output on the variations in intrathoracic pressure during the respiratory cycle. Any deviation from the normal in this respect is followed by a parallel alteration in the heart's output, though not always in the same direction. Thus a raised pressure throughout the respiratory cycle produces a proportional fall in the cardiac output. Provided the mask pressure drops rapidly to atmospheric at the end of inspiration, and provided inspiration and expiration are of equal duration, no cardiac embarrassment need be feared when using mechanical substitutes for normal respiration.

The wide distribution of small mechanical respirators may give the layman a new and perhaps undesirable conception of the treatment of asphyxia. This danger has been emphasised repeatedly by Paluel Flagg and Yandell Henderson in America. A few years ago, Flagg wrote[5]:

> "If a child inhales a peanut or a pin, he is hustled off to the hospital and receives every advantage of the bronchoscopic clinic. Should he be so unfortunate as to inhale something larger, a marble or a chunk of meat, he is no longer in need of medical help. Everything will be solved if *the suck and blow apparatus used last week in the* stevedore down the street can be secured."

Henderson[6] called the suck-and-blow type of machine "a back-step towards the death of thousands." In this country, until it is certain that the expense of mechanical respirators would be justified in lives saved, we cannot do better than train our doctors and first-aiders to use the simpler methods of treating asphyxiated people.

FOR SMOOTHER RUNNING

STORIES of patients annoyed and frustrated by the way they are received at hospitals are too common to be ignored. The chilly welcome, the unguided search for the ward, the long hours of waiting in the outpatient department, and the obligation to repeat the same basic facts to every hospital officer who asks, are familiar vexations to the people who use, and now own, the hospitals. Such bad hospital manners are often the outcome of an archaic system of administration in a hospital which has outgrown its floor-space and is scarcely able to deal with the work it is equipped to do. Trouble is caused by out-of-date filing systems, puzzling methods of registration and record-keeping, lack of an appointments system, and other remediable defects. King Edward's Hospital Fund for London, in the hope of clearing the way for better customs, recently held a short course for administrative officers, to enable them to study the admission systems in a number of hospitals which have lately been reviewing the subject. The course was supervised by Mr. S. W. Barnes, house-governor of King's College Hospital, and he and the members of the course have now drawn up a report of their findings.[7]

Of 8 hospitals visited, 5 made appointments for new and old patients. The arrangements work well if they have the support of the doctors on the staff; but as this, unfortunately, is not always ungrudging, the task of arranging the appointments system must be placed in the charge of "an enthusiastic and tactful officer who will study their individual needs and gain their active coöperation." It is better, Mr. Barnes and his colleagues decided, to make the system compulsory, no outpatients being seen without an appointment unless they are referred from the casualty department as urgent cases. This helps to make patients and their family doctors appointment-minded. A patient who arrives without a doctor's letter, saying he feels ill, is seen by the casualty officer and, if his condition is urgent, is referred to a consultant. The writers of the report believe an appointments system, besides saving the patient time and trouble, simplifies the work of the hospital in several ways: it saves space, eases the work of the records staff, shows which clinics are overcrowded, and ensures a steady flow of patients to the ancillary departments. The list of patients due to attend can be used by the appointments office when checking misplaced notes, and makes the counting of outpatient attendances easier. The writers recommend that there should be one central appointments office to deal with the attendances at all clinics and departments. Events can then be made to dovetail, the patient polishing off his visits to various clinics on a single day, and special reports on his condition being completed in time for his next consultation.

The medical staff, wanting to reserve cases for teaching, sometimes insist that they cannot do this until they have read the doctors' letters. At King's College Hospital the appointments staff, who have been told what types of case to reserve, open all letters and make appointments accordingly. In the case of old patients, consultants mark the folders of the cases they need for teaching. The medical committee should be told when clinics are booked up a long way ahead, since it may be possible to arrange an extra clinic; and a margin of time is usually left, when appointments are made, so that urgent cases can be fitted in.

Some long-needed strictures on the appearance of outpatient departments should be appreciated by patients. *To ask a sick person to sit for hours on a* wooden bench in a cheerless flagged hall, watching the fat neck of the man in front, or listening to the wheezing *of a neighbour or the fretful crying of a tired bored child* is as good a way of turning his uneasiness to anxiety and his anxiety to downright fear, as could well be devised. The report urges some overdue reforms—light-painted walls, coloured comfortable chairs, odd tables and plenty of papers and magazines—something more like a doctor's waiting-room and less like an approach to a morgue.

Again, "the patients' opinion of the hospital will be largely formed by the way they are treated at registration"; hence registration clerks need to be "tactful, kind and patient, with a pleasing personality." Some good detailed advice on the management of waiting-lists should also promote the comfort of patients. They should be given some idea of the time they will have to wait, warned to tell their own doctor if they get worse, and given a new forecast by letter "at least every three months." This last, somewhat ironic, proposal shows what a wounded snake our waiting-lists have become.

Every hospital, the writers consider, should have a medical records committee to define policy and keep the wayward doctors to it. A standard design of case-sheet is advocated within the hospital, but not between hospitals, since this would damp initiative and stultify progress. Hospitals must go on testing new methods. Details of cabinets, filing systems, and staffing of the *records department need close study. In silent comment* on human fallibility, the writers advise that the records office should be locked after hours, and that those seeking notes at such times should be made to sign for the key.

The *Times* reports that the World Health Organisation is arranging a conference of government representatives from war-devastated European countries. At the World Health Assembly Soviet Russia supported a large programme of supplies for these countries, and it was decided that Europe should have a temporary office "for the liquidation of war damage" in the field of health. The conference, which will meet at Geneva on Nov. 15, will consider the nature of the services required.

DR. ROBERT CRUICKSHANK has been appointed to the chair of bacteriology at St. Mary's Hospital as from Jan. 1, 1949.

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[5] Flagg, P. J. *Science*, 1944, 99, 469.
[6] Henderson, Y. *Ibid*, 1943, 98, 547.
[7] Some Observations on Hospital Admissions and Records. London: Published for the King's Fund by Geo. Barber & Son, 1948 Pp. 28. 1s.

Special Articles

MEDICAL EDUCATION IN THE UKRAINE

W. P. Forrest
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In Soviet Russia all medical students are trained with view to occupying planned posts in a State health stem. For example, since children constitute about a rd of the population and their care is entirely ispensarised," it is intended that a third of all doctors duating should have some special knowledge of diatrics. A similar arrangement holds for the other nches of the medical profession, but the targets are t always reached.

The system of education and the curricula are stan- rdised throughout the U.S.S.R. In each republic all dical education is subject to supervision by the local nistry of the Care of Health, which supplies the funds d the personnel, and the Ministry of Higher Education, ich manages the institutes. These ministries are bject to supervision by the All-Union Ministries in scow. All professional examinations are All-Union aminations, so a minimal standard is maintained roughout the country, and a diploma or other qualifica- n obtained in one part of the country is valid in every ber.

CATEGORIES OF MEDICAL WORKERS

Qualified medical practitioners have received their ining in higher educational institutes and are classified follows: medical practitioners with "broad" speciali- tion; medical specialists with "narrow" specialisa- n; medical research specialists; assistants (teaching or arch); aspirants; candidates; docents; professors; tors of medical sciences; corresponding academicians; emicians.

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State sanitary inspectors are educated in the higher titutes.

ENTRANCE EXAMINATIONS

A candidate for entrance to a higher institute must ve attended a ten-year school for pupils aged 7–17 nd either hold the silver or gold medal of that school or ss the entrance examination of the institute he has hosen. The choice of profession and institute is free, nd students are given every facility to meet the pro- ssors to have the curriculum and prospects explained. his is a routine procedure during the last years at the en-year school. Special privileges are accorded to war terans and children of Heroes of the Union.

All entrance examinations are held on or about the me date, and the students must surrender their birth rtificates and school diplomas on entry to the examina- ion; hence it is virtually impossible for them to sit several xaminations in the hope of passing one of them.

A candidate for entrance to a lower institute must ave attended a seven-year school and is usually required o pass an entrance examination. Lower institutes are oughly equivalent to the technical schools in industrial ducation.

FINANCIAL ARRANGEMENTS

The financial arrangements are the same in principle throughout the Union; only the payments vary. All students receive stipends which are sufficient to maintain them and pay the very low fees. Outstanding students receive extra stipends, and the best get Stalin prizes, which take the form of a large incremen stipends. The stipends increase from year to ye cease if the student twice fails to pass his examina

The payment of fees by the students is intende inculcate a sense of responsibility and ability to mana their own budgets. Thus, the students receive stipen of 220–700 roubles a month. They have dining-rooms and dormitories, recreational and games facilities, and many other amenities, all of which are free, except for a daily charge of about 3·5 roubles for three meals a day.

Fees amount to 300–450 roubles a year, but seldom more than 60% of students pay the full fees, privileges being given to special groups.

THE MEDICAL CURRICULUM

At present the course lasts six years but it may be extended to seven in the near future.

First Year.—The subjects are Marxism-Leninism (a form of training in logic and philosophy), Latin, English, physics, biology, and parasitology; a start is made on anatomy, histology, physiology, embryology, analytical chemistry, and biochemistry.

Second Year.—Students continue with English, anatomy, histology, embryology, the chemistries, and physiology. At the end of this year is held the "half" State examination—an intermediate examination which weeds out the unsuitable students. The following subjects must all be passed at the same time, failure in one involving failure in all: (1) human anatomy, (2) histology and embryology, (3) physiology, and (4) biological chemistry. Permission to "sit" again may be obtained and students are often placed in other careers.

Third Year.—Here the "broad specialisation" begins to influence the subjects taught. The students start the study of microbiology (bacteriology), pathological physiology, pharmacology, pathological anatomy, diagnostics and "private" pathology and therapy, and general surgery. He has commenced clinical attendances in his second year (some even start in the first) and will continue these until the end of the course. At the end of this term there is an examination (not a "State" examination) and the student does his first "physician's practicum." He repeats this in the summer of the fourth year and in the fifth summer will do his "physician's subordinator"—a form of internship. These clinical periods involve about seven hours a day for at least three months.

In the *fourth year* the students really begin their specia training as general practitioners, pædiatricians, sanitary physicians, &c. There is an examination at the end of this year.

The *fifth year* sees the completion of the apprenticeship and many of the smaller subjects, such as venereal diseases, pædiatrics, tuberculosis, infectious diseases, ophthalmology, radiology, &c. The range of these is complete; there are no omissions.

The *sixth year* is more intensely clinical, finishes off the special subjects, and completes the intensive clinical studies.

The number of hours given to each subject is shown in the accompanying table.

FINAL STATE EXAMINATION

The final examination (known as the "full" State examination) always has nine subjects, every one of which must be passed at the same sitting.

A. *General Medical Faculty* ("*broad specialisation*")

1. Human anatomy
2. Pathological anatomy
3. Pathological physiology
4. Internal diseases (=medicine)
5. Surgical diseases
6. Obstetrics and gynæcology
7. Infectious diseases
8. Children's diseases
9. Hygiene

B. *Pædiatric Faculty* (" *broad specialisation* ")

1 to 6 as above
7. Children's diseases
8. Children's infectious diseases
9. Hygiene

C. *Faculty of Sanitary Physicians* (" *broad specialisation* ")

1. Microbiology
2 to 5 as above
6. Epidemiology and infectious diseases
7. Environmental hygiene
8. Hygiene of " feeding "
9. Hygiene of labour (industrial medicine)

The successful student is entitled to a diploma which states that he has passed the State examination, that he has studied six years at the institute, and that he is a qualified physician with broad specialisation in whichever subject has been his specialty.

Examinations (except State examinations) are not so important as the personal file, which is kept for each student and shows every detail of his academic career. This is on the examiner's table. It is also used at the State examinations, where it usually has no more than 50% significance.

Some of the smaller institutes only graduate students of group A.

ON GRADUATION

A newly qualified doctor commands a salary of 800 roubles or more a month according to his record. Housing is guaranteed—a tremendous concession—and is free. Special rations of food and clothing are granted, and in the country the doctor receives a garden, a cow and other livestock, and special rations of fuel and other scarce commodities.

An inspector from the All-Union Ministry of the Care of Health meets the graduates and shows them the list of vacancies, from which they choose. The best students are retained by the professors for training as research-workers and teachers. The professor who has vouched for such a student must report every six months to the Uchonny Soviet—a council of research-workers. This enables a control to be kept on all such workers.

Except those taken for research or teaching, all graduates must spend their first three years where the ministry wishes to send them—i.e., they are subject to direction. Many stay on in the posts to which they were directed, after the end of the three-year period.

RESEARCH

The division of institutes into teaching and research entities, so extensively practised in all other branches of science in the U.S.S.R., has been fought by the medical profession. They have retained the more familiar mixed institutes, and are quite elated about it, since some other professions are now convinced that the medical profession was right. So these teaching institutes are 50% research, and the teaching staff divides its time equally between research and teaching. Research in this country very often involves large hospitals and much clinical work.

MEDICAL AUXILIARIES

Pharmacists and State sanitary inspectors are trained in higher institutes, and all the other medical auxiliaries in lower institutes.

Pharmacists are employees of the Ministry of the Care of Health and operate chemists shops controlled by that ministry. Supplies come from the Ministry of Medical Industry. They have a four-year course and receive diplomas.

State sanitary inspectors are in a rather different category, since the State sanitary inspection is an independent organ of the central government, responsible to the local health authorities at each level, but with power of appeal to the chief of the State sanitary inspection in the Ministry of the Care of Health in Moscow. Thus he has direct access to the Council o Ministers of the U.S.S.R. It is therefore both an operativ and a controlling organisation. It possesses the wides powers, and woe betide the wretched plant manager o even State minister of health who contravenes th sanitary laws. In practice, little friction arises, and most useful function is undoubtedly performed by thi service.

State sanitary inspectors who are always medicall qualified, have a 1–2 years' course in special institutes o sanitary science and receive a diploma. The curriculun in these courses covers all the usual aspects of sanitar science including industrial, food, meat, and environ mental hygiene, and the hygiene of public utilities. Th course and the policies are decided according to the lates medical hygienic opinion supplied by the All-Unio Ministry of Health. One of the deputy ministers o health of any republic or State is always a sanitar inspector.

The other medical auxiliaries are all educated in lowe institutes and spend some time as apprentices to experi

ALLOCATION OF TIME TO THE VARIOUS SUBJECTS OF THE CURRICULUM

Subject	Medical faculty		Pædiatric faculty		Hygiene faculty	
	Years of course	Total hours	Years of course	Total hours	Years of course	Tot hou
Marxism-Leninism ..	1 & 2	250	1 & 2	250	1 & 2	25
Latin	1	108	1	108	1	10
Foreign languages (English)	1 & 2	190	1 & 2	190	1 & 2	19
Physics	1	144	1	144	1	14
Biology and parasitology	1 & 2	216	1 & 2	216	1 & 2	21
Human anatomy.. ..	1 & 2	308	1 & 2	308	1 & 2	30
Histology and embryology	1 & 2	250	1 & 2	250	1 & 2	25
Inorganic and analytical chemistry	1	162	1	162	1	16
Biochemistry, including physical and colloidal chemistry	1 & 2	374	1 & 2	374	1 & 2	37
Physiology	2	278	2	278	3	27
Microbiology	3	255	3	255	3	[illegible]
Pathological physiology..	3	162	3	162	3	16
Pharmacology	3	219	3	219	3	[illegible]
Pathological anatomy ..	3 & 6	264	3 & 6	264	3	[illegible]
Diagnostics, " private " pathology and " private " therapy	3 & 4	332	3 & 4	332	3 & 4	[illegible]
General surgery	3 & 4	213	3 & 4	179	3 & 4	[illegible]
Operative surgery and surgical anatomy	4	127	4	113	4	11
Hygiene	4	254	4	260	4	11
History of medicine ..	4	34	4	34	4	3
" Faculty " therapy including a course on tuberculosis	4 & 5	276	4 & 5	208	4 & 5	214
" Faculty " surgery ..	4 & 5	248	4 & 5	180	4 & 5	180
Dermatology and venereology	4 & 5	124	4 & 5	124	4 & 5	107
Nervous diseases ..	5	138	5	124	5	110
Organisation of the care of health	5	85	5	96	5	96
Midwifery and gynæcology	4 & 5	279	4 & 5	192	4	193
Practical obstetrics ..	..	q.s.	..	q.s.	..	q.s.
" Hospital " therapy (medicine)	5 & 6	304	5 & 6	184	5 & 6	109
" Hospital ", surgery (including short course of jaw surgery)	5 & 6	332	5 & 6	240	5 & 6	181
Diseases of children ..	5 & 6	212	..	..	6	70
Infectious diseases and epidemiology	5 & 6	184	5	124	5 & 6	132
Diseases of the eye ..	5 & 6	96	5 & 6	82	6	72
Diseases of ear, throat, and nose	5 & 6	96	5 & 6	96	6	79
Psychiatry	5 & 6	100	6	92	6	70
Forensic medicine ..	5 & 6	100	6	84	6	84
General course on children's diseases	..	..	4	124	..	..
" Faculty " pædiatrics ..	..	..	5	158	..	..
Hospital pædiatrics and tuberculosis in children	..	..	6	218	..	..
Infectious diseases of children	..	..	5 & 6	128	6	95
Special surgery of children	..	..	6	128	..	..
School hygiene	..	..	See Hygiene			
Environmental hygiene..	..	..	..	..	4 & 5	[illegible]
Hygiene of food	..	..	..	..	4 & 5	169
Epidemiology	..	..	..	..	5 & 6	164
Industrial hygiene ..	..	..	..	..	5 & 6	230
School hygiene	..	..	..	..	5 & 6	92

enced members of the same profession before taking up independent work. It is planned to have four medical auxiliaries for every one doctor.

Dentists are really dentists' assistants and always work under the supervision of stomatological specialists, who are medical practitioners whose specialty is the mouth. They have a three-year course similar to the old four-year dental courses in other countries but with more emphasis on the practical side and less on academic work. They work in stomatological clinics, children's clinics, mothers' clinics, factory polyclinics, and in rural areas.

Feldshers and Feldsheritsas.—These are mostly to be found in rural areas or where there is a population too small to support a full-time doctor—i.e., less than 1500 population. The Feldshers provide the lieutenants and sub-lieutenants of the army medical service, and usually do much the same work as would be done by highly qualified nurses in the U.S.A. and U.K. They operate feldshers' points in the country, usually one for each small group of villages or collective farms, and small sanitary points in factories too small to have a factory doctor or polyclinic. Their duties are strictly laid down, and they are always responsible to the district medical officer, who they must call in or consult for any occurrence above a given level and in all cases of infectious disease. They do the doctor's "donkey-work" in the country and provide first-aid. They are educated in lower institutes for three years. The training is again more practical than academic but is very well designed for the duties they have to perform. They receive a diploma and serve their first two years as assistants to experienced feldshers in the field, after which they manage their own unit or practice. They have a most important educational function and are the first link in the collection of medical statistics. Feldsheritsas are permitted to work in towns to be near their husbands. Over 60% of all feldshers are women.

Feldsher midwives receive a three-year course (almost exactly the same as the course for midwives in Scotland but more extended, with greater practice) in lower institutes. The feldsher midwife serves in maternity homes and hospitals in the urban areas and is in charge of the lying-in houses which must be provided by the collective farms. She manages these, looks after antenatal and postnatal care, arranges consultations, and registers all pregnancies and births. Her duties are strictly laid down, and she is responsible to the local doctor for maternal care. She carries out much educational work.

Medical Nurses.—It is to be expected, in view of the existence of feldshers and feldsher midwives, that nurses would come in rather lower down the medical scale, and such is the usual case. Nurses receive two years' training in lower institutes, including much practical work (half of the time) in hospitals and polyclinics, and receive a diploma. They are not commonly seen in the countryside, except in village hospitals, polyclinics, or ambulatories attached to the district medical headquarters. Their sphere of action is in the urban areas, where they are to be found in all medical institutions. Extensive facilities are provided for them to improve their status, especially in the field of the care of children's health, where they can become directors of orphanages, nurseries, and other institutions maintained by the health authorities for children up to the age of four. They are also to be seen in sanatoria and rest-cure establishments. All discipline of nurses is always the responsibility of the chief nurse of the institution who in turn is responsible to the director; she does not have the other administrative functions of the U.S.A. or U.K. matron. It is unusual for a nurse to be responsible to a feldscher.

Pharmacists' assistants stand to the pharmacist as dentists do to the stomatologist. They are trained for 2 or 3 years and serve in chemists' shops.

POSTGRADUATE EDUCATION

Postgraduate education has been instituted "continually to raise the qualifications of medical w of all kinds." Facilities are available for all me workers to take refresher courses arranged, in consultat. with the requisite institute, by Oblasdrav (rough equivalent to county medical administration). The worker is notified and goes for various periods of a month upwards to the institute to which he is directed. While he attends the institute he receives a stipend almost equal to his salary, and his family receives his salary. No fees are charged.

In the Ukraine there are four institutes for postgraduate studies for physicians: Kiev (the oldest), Kharkov, Odessa, and Lvov (the newest). The postgraduate work is usually, but not always, combined with specialisation to fit the practitioner for a more important post in Oblasdravotdel (county health-administration affairs).

Apart from raising the standard of proficiency of the medical practitioners and bringing their knowledge up to date, and providing further specialisation (but not making them specialists) these institutes provide one of the main channels for training medical specialists for teaching and research. This is done by providing "ordinature"—i.e., internship and training for medical specialists—and "doctoranture"—i.e., facilities for preparing an M.D. thesis. The institutes do not give degrees as doctors (or candidates); these are given only by the Academy of Sciences, which works in close coöperation with the institutes. This work usually takes 2 or 3 years. The institutes also coöperate in research work, which is always closely integrated with teaching. The various faculties of the institutes are usually in the same premises as the research units.

Registers are kept of all doctors who have passed through the institutes, and these records are available to assist any other health institution in staffing problems. The institutes advise Oblasdrav on optimum staff requirements, as regards both numbers and specialisation, and encourage Oblasdrav in raising the general standard of its employees. This is a two-way arrangement and in no case constitutes direction of one party by the other. Oblasdrav is obliged to listen to the advice of the institutes, and vice versa.

These institutes are large and are not located in one building, and several chairs are attached to each large teaching and research hospital or institute. In Kiev there are thirty-three chairs, which can prepare students for more than 33 specialties. Thus the entire range of postgraduate medical study is fully covered.

THE FINISHED PRODUCT

It is difficult for a stranger to assess the finished product, but by all pragmatic standards the graduates appear to be as well qualified as their contemporaries in other countries, and indeed better than in some. To judge by the curriculum and the calibre of the instruction, they must be better prepared than most, but the present serious shortage of specialised equipment undoubtedly nullifies some of the advantages of the very full course of instruction and practice. This will pass, however.

To judge by results, the students are very well trained indeed. Medical teachers declare that the graduate of today is vastly superior to his predecessor of even ten years ago; they proved themselves well able to do excellent work in the appalling conditions and almost total lack of modern facilities prevailing during the occupation; it is generally recognised that they did excellent work with the Red Army; and there have been no epidemics in Russia, in spite of ideal circumstances for outbreaks of infectious disease.

It is considered that other countries have something to learn from the educational methods in force here, and especially from the integration of medical education with the national requirements for medical personnel.

I am indebted to the Hon. I. F. Kononenko, formerly Minister of Care of Health for the Ukrainian S.S.R., and Dr. Lev. I. Medved, now Minister, who have accorded me every facility; Prof. S. S. Kagan, chair of organisation of health, who has been my guide, philosopher, and friend; Professor Kalchenko, director of the Kiev Postgraduate Institute; Docent Kalainichenko, director of the Kiev Medical Institute, and all the other professors, docents, and physicians who have supplied me with information.

MEDICAL PROTECTION SOCIETY

Sir Ernest Rock Carling, the president, addressing the annual general meeting of this society held in London on Sept. 29, said that it had had another successful year: the membership had steadily increased and the financial position was sound. With the coming of the National Health Service the future was uncertain; but nothing in past experience suggested that attacks on the profession by disgruntled patients would grow fewer. Government departments had a tendency to compromise, without clearing the character of the professional person attacked; and lawyers were inclined to exaggerate the alleged shortcomings of the medical man, attributing to his neglectfulness and hard-heartedness—if not actual malice—the entire effects of accident or disease. The costs of medical protection were likely to rise rather than fall; but the society faced the future with confidence and solid assets. One advantage it might gain from the National Health Service was that the doctor would have to keep good records; for in the past many a case had been prejudiced for lack of notes.

Remarking on the trouble caused by broken hollow needles, Sir Ernest said that in all cases where the society had submitted the fragments to a metallurgist a manufacturing defect had been found. He hoped for improvement of manufacture, but also reminded members that needles must not be cleaned with, or immersed in, solutions of iodine, which even in minute traces could erode and weaken them. Another source of frequent trouble lately had been fracture of the jaw during dental extractions. This was by no means always the result of bad work: it was often due to osteomyelitis, which could be properly treated only by removal of the offending teeth. Nevertheless wherever there was a possibility of osteomyelitis leading to fracture it was important to radiograph the jaw first.

Where there was some mishap the doctor or dentist was often uncertain whether he should tell the patient (or the relatives). In the vast majority of cases the patient should be informed: to give the facts never redounded to the practitioner's discredit.

The objects of the society, said Sir Ernest in conclusion, were not merely to protect medical men: having the same objects as medicine as a whole, it was concerned with prevention as well as defence, and it sought at all times to encourage correct professional behaviour.

The society's expenditure for the year 1947 averaged 23*s*. 3*d*. per member, though the subscription remained at £1. With accumulated funds standing on Dec. 31 at £112,991, the resources available for protection were £145,816, and the society is reinsured to an unlimited amount against adverse costs and damages exceeding a specified amount during any one year.

Tribute was paid at the meeting to the late Mr. G. F. Stebbing, who has been succeeded as chairman of council by Dr. G. M. Stoker. Sir Robert Hutchison spoke in warm terms of the service rendered to the society by Sir Ernest Rock Carling, who was re-elected president.

Mr. W. M. Mollison will serve again as treasurer.

Dr. A. R. French was appointed secretary of the society in place of Dr. R. W. Durand, who is going to Belfast as medical superintendent of the City Hospital.

Disabilities

14. POLIOMYELITIS

I CONTRACTED poliomyelitis two years after I ha qualified. During the first epidemic in Dublin, in Apri 1941, I developed what seemed to be a full-blow meningitis. Lumbar puncture was a great comfor Paralysis developed over two days, from the leg upwards. At its height I could just breathe unaided b concentrating hard, and chewing, swallowing, and faci expression were unaffected; otherwise I could onl move my fingers and turn my head on the pillow. Fo three days I had retention of urine and double visio In the next week there was a decided improvemen and thereafter a very slow recovery. I developed extre tenderness along the nerves and tachycardia, both which persisted for 6 months. After 4 weeks' illness, f reasons of occupation and economy, I asked to be broug home, though I was sorry to leave the fever hospit where everyone was wonderfully kind to me.

Being impatient for recovery, and encouraged by t delusion that I would soon reach it, I worked hard at m muscles from the start, despite the invariable appeal those days to "avoid overdoing it." By the 6th wee I could turn over in bed in 45 minutes, by exerting sy tematic traction on my pyjamas and sheets and leveri my pelvis sideways with my knuckles. By the 3rd mont I could travel slowly round the bed. It still took m five minutes to turn over, and I felt faint in ten minut if I sat up, despite a firm abdominal belt. I was so waste that my finger and thumb would meet round my ar from wrist to elbow and from elbow to shoulder. At months I could just manœuvre myself off my low be on to my hands and knees on the floor and back agai and at 9 months I could struggle up sideways into sitting posture, crawl short distances, and negotiate flight of shallow steps with the combined technique worm and monkey. I still felt faint after half an hour sitting. At 10 months I was promoted to a wheel-chai and at 1 year I could get in and out of it unaided; what more, when placed on a tricycle I could drive it eight yards round the garden, with the help of a hoe.

At $1^1/_2$ years I was travelling round the house and u the stairs on my feet, clinging to furniture or banister and I could walk round the garden clinging to a rop I did two miles on the tricycle every two or three day and in the next 6 months I increased my rides to eigh miles. I was beginning to walk alone, bent over tw sticks, and was learning to bicycle in a narrow corrido where there is less scope for falling. Most of my time wa still spent lying down. At $2^1/_2$ years I was walking up right, with one stick, for two miles or so and doing som digging and fuel stacking. I had discarded my abdomina belt. By 3 years I could do extensive heavy work, rid 40 miles on my bicycle, and pull myself up to my chi on a horizontal bar twice. I still lay down for hal the day. At $3^1/_2$ years I could walk ten miles without stick in five hours and could just get up from a fla surface, if it was not too smooth, without a stick.

It is now $6^1/_2$ years since my illness. Progress has bee slower in the last 2 years or so, from flagging enthusiasm and greater demands on my time. I can sit without slouching, stand erect, and keep my hips steady when I walk, so my gait attracts no notice. My maximum speed on foot is five miles in $1^3/_4$ hours. Stairs are still awkward, because I cannot yet stand on one leg with a bent knee.

* * *

From my own experience and other people's, the general idea that early return of voluntary muscle power is a good sign seems to be justified, for muscles that improve well at first maintain their lead and can be expected to become powerful if exercised. On the other hand, states like the following from a well-known textbook misleading: "Muscles that are going to recover i power will already have done so by the third th." All my muscles recovered more strength in the d 3 months than in the first 3, and much more in second 6 months than in the first 6. Almost all my les developed considerably more in the second year in the first, and most developed more in the second rs than in the first 2. My weaker muscles are still roving, with increasing returns for any effort I put them. My interest has returned, and dancing is the t target. A friend of mine is improving after 18 s, during 9 of which there was complete neglect. e seems to be no time limit to improvement of gth. The slowest progress in rehabilitation, apart the spontaneous recovery after the acute phase, is lly at the beginning.

he arch enemy of the poliomyelitis patient is stag- on, from the first day of his illness until he is sound n. Physically, mentally, and morally he must be fresh and stimulated by every means in the doctor's er. In the acute stage, frequent passive movements a great delight. One never loses the wish to move, the craving is strong in the early days. Frequent on and gentle massage all over are highly refreshing. warmth will prevent the cramps which come on when limbs are raised. With plenty of gentle handling the derness disappears more quickly than without, and dentally, it disappears quicker in the more exercised cles than in the others. Deep abdominal massage, icularly in the acute stage and the first few weeks, s to stave off the petty miseries of constipation and es and enemas, flatulence and indigestion. As soon the temperature drops every muscle should be exer- d to halt atrophy from disuse. Electricity is good at stage if the patient can stand it.

er the first month or so one's morale tends to en. Progress can be so slow that patients sometimes their escape from death. Initiative may well e altogether, with spasmodic revivals. Everything e when one begins to get out and about. People nd to the physically hampered, and there can be a humour in an old lady or an errand boy pushing tricycle up an incline or over a bridge. But nothing prevent humiliation when one has to spend hours, frequent rests and the next day flat in bed, elling a distance an ordinary person covers in a minutes.

he doctor who is an understanding friend can work ders—if he has the time and the necessary know- of mechanics. A special institution is a perfect ironment; here the patient will learn a lot from his ows, even if he is a child, and he will be instructed questions of apparatus. Failing that, the patient his family must be organised at home, but it is hard the poliomyelitis victim on his own to exercise himself he should. He rarely if ever does. Some muscles likely to be forgotten, as often happened with my k and abdomen. Careful and complete records, larly filled in, will reveal many little improvements would otherwise pass unnoticed.

A purposive mental or manual occupation is essential, erably with some responsibility, or under the orders outsiders, and if possible remunerated. It may be essary at times for the doctor to tell a patient who is his own to stop being sorry for himself and think about ething useful. He should be encouraged to be ependent and look after himself, even if he finds this cult. Poliomyelitis cripples in the same neighbour- d might derive much mutual encouragement if they t in touch with each other, making a sort of club.

If there are many weak muscles both doctor and ient may need to do much reading and discussing to n real progress. Fatigue is an essential part of the development of a muscle. Nature seems to provide a reserve beyond ordinary demands, and if this reserve is steadily encroached upon she builds up a larger one. It is the activity that the patient can only just perform, or cannot quite perform, that will bring back his strength. If increasing demands are not made, one can expect no improvement. Surely this applies to any training, physical or mental? At the end of a session of effort the muscles should be appreciably weaker.

Pain in a muscle as the direct result of exercise will follow a sudden large increase of effort, and will not return when that new effort is repeated. It appears to be without harmful significance; when my muscles became sore they gained strength faster than at other times.

There is a difference between developing strength and developing stamina, but both are important. Plenty of routine physical activity, carefully graded, will build up stamina. Special short sessions designed to produce rapid fatigue will increase strength. As the patient recovers the short sessions should be increased in number, and he should be encouraged to move more rapidly. The American idea of putting weights on the patient—lead insoles, for instance, or a bag of shot round the ankle or wrist or elbow—is excellent. Progress is a matter of compound interest: a stronger muscle gains strength more rapidly than a weak one. The dreary work of the first few months may seem entirely futile, but it is indispensable.

Fatigue can be dangerous if it is cumulative, and there is some justification for the usual concern. Muscles can shrink and the patient become a nervous wreck. There must always be sufficient rest to correspond to the exercise. If the routine is so planned that the muscles recover their best strength at some time every day, or even every two or three days, there is nothing to fear. When he is not taking exercise the patient should spend most or all of his time flat in bed. Meals can be taken quite conveniently from a tray on the chest; the head should be as vertical as possible, with the shoulders flat on the bed. This posture is much more comfortable than it looks, brings no deformity, and was my favourite one for over three years. The extra energy saved is surprising.

If the diet is poor, progress will slow down, for there is something peculiarly depressing about trying to exert oneself on poor food. A full diet, with sufficient minerals and vitamins, makes an obvious difference; and extra iron and vitamin C now and then are a help.

The most convenient apparatus for home use is an overhead hook or beam, at a good height. To this spiral springs (much handier than weights and pulleys) can be attached, or plain cords. Limbs mounted in slings can make any movements needed, without the influence of gravity, if the patient is in a suitable position. Gravity can be gradually brought into play by lowering the fixed point and shortening the cords. If the shoulder muscles are recovering, a back brace is a hindrance rather than a help. Very little attention will prevent scoliosis or other deformity. Good gutter splints are comfortable for *resting* the legs in, but there should be no flexion at the knee, however slight.

I found a 'Dunlopillo' square more comfortable and reliable than an air ring. But, when one's back muscles are negligible, deformity will result if the pelvis is kept raised, so I used a flat pad of sponge rubber, covered in soft cloth, with a hole just large enough to accommodate the prominent part of the sacrum.

* * *

To sum up: There is no apparent limit to progress. The beginnin [illegible] the slowest. A special institution is de[illegible]rging more [illegible] is absolutely necessary for muscle d[illegible]hould he make t[illegible]rest and proper diet are also essential. J[illegible]tion ready finish general stagnation can be the patient's [illegible] of this argument especially from the integration of medical education with the national requirements for medical personnel.

I am indebted to the Hon. I. F. Kononenko, formerly Minister of Care of Health for the Ukrainian S.S.R., and Dr. Lev. I. Medved, now Minister, who have accorded me every facility; Prof. S. S. Kagan, chair of organisation of health, who has been my guide, philosopher, and friend; Professor Kalchenko, director of the Kiev Postgraduate Institute; Docent Kalainichenko, director of the Kiev Medical Institute, and all the other professors, docents, and physicians who have supplied me with information.

MEDICAL PROTECTION SOCIETY

Sir Ernest Rock Carling, the president, addressing the annual general meeting of this society held in London on Sept. 29, said that it had had another successful year: the membership had steadily increased and the financial position was sound. With the coming of the National Health Service the future was uncertain; but nothing in past experience suggested that attacks on the profession by disgruntled patients would grow fewer. Government departments had a tendency to compromise, without clearing the character of the professional person attacked; and lawyers were inclined to exaggerate the alleged shortcomings of the medical man, attributing to his neglectfulness and hard-heartedness —if not actual malice—the entire effects of accident or disease. The costs of medical protection were likely to rise rather than fall; but the society faced the future with confidence and solid assets. One advantage it might gain from the National Health Service was that the doctor would have to keep good records; for in the past many a case had been prejudiced for lack of notes.

Remarking on the trouble caused by broken hollow needles, Sir Ernest said that in all cases where the society had submitted the fragments to a metallurgist a manufacturing defect had been found. He hoped for improvement of manufacture, but also reminded members that needles must not be cleaned with, or immersed in, solutions of iodine, which even in minute traces could erode and weaken them. Another source of frequent trouble lately had been fracture of the jaw during dental extractions. This was by no means always the result of bad work: it was often due to osteomyelitis, which could be properly treated only by removal of the offending teeth. Nevertheless wherever there was a possibility of osteomyelitis leading to fracture it was important to radiograph the jaw first.

Where there was some mishap the doctor or dentist was often uncertain whether he should tell the patient (or the relatives). In the vast majority of cases the patient should be informed: to give the facts never redounded to the practitioner's discredit.

The objects of the society, said Sir Ernest in conclusion, were not merely to protect medical men: having the same objects as medicine as a whole, it was concerned with prevention as well as defence, and it sought at all times to encourage correct professional behaviour.

The society's expenditure for the year 1947 averaged 23*s*. 3*d*. per member, though the subscription remained at £1. With accumulated funds standing on Dec. 31 at £112,991, the resources available for protection were £145,816, and the society is reinsured to an unlimited amount against adverse costs and damages exceeding a specified amount during any one year.

Tribute was paid at the meeting to the late Mr. G. F. Stebbing, who has been succeeded as chairman of council by Dr. G. M. Stoker. Sir Robert Hutchison spoke in warm terms of the service rendered to the society by Sir Ernest Rock Carling, who was re-elected president.

Mr. W. M. Mollison will serve again as treasurer.

Dr. A. R. French was appointed secretary of the society in place of Dr. R. W. Durand, who is going to Belfast as medical superintendent of the City Hospital.

Disabilities

14. POLIOMYELITIS

I CONTRACTED poliomyelitis two years after I
qualified. During the first epidemic in Dublin, in A
1941, I developed what seemed to be a full-bl
meningitis. Lumbar puncture was a great com
Paralysis developed over two days, from the
upwards. At its height I could just breathe unaide
concentrating hard, and chewing, swallowing, and fa
expression were unaffected; otherwise I could
move my fingers and turn my head on the pillow.
three days I had retention of urine and double vis
In the next week there was a decided improvem
and thereafter a very slow recovery. I developed extr
tenderness along the nerves and tachycardia, both
which persisted for 6 months. After 4 weeks' illness,
reasons of occupation and economy, I asked to be brou
home, though I was sorry to leave the fever hospi
where everyone was wonderfully kind to me.

Being impatient for recovery, and encouraged by
delusion that I would soon reach it, I worked hard at
muscles from the start, despite the invariable appea
those days to "avoid overdoing it." By the 6th w
I could turn over in bed in 45 minutes, by exerting
tematic traction on my pyjamas and sheets and leve
my pelvis sideways with my knuckles. By the 3rd mo
I could travel slowly round the bed. It still took
five minutes to turn over, and I felt faint in ten min
if I sat up, despite a firm abdominal belt. I was so was
that my finger and thumb would meet round my a
from wrist to elbow and from elbow to shoulder. A
months I could just manœuvre myself off my low
on to my hands and knees on the floor and back ag
and at 9 months I could struggle up sideways int
sitting posture, crawl short distances, and negotiat
flight of shallow steps with the combined technique
worm and monkey. *I still felt faint after half an ho*
sitting. At 10 months I was promoted to a wheel-ch
and at 1 year I could get in and out of it unaided; wh
more, when placed on a tricycle I could drive it eig
yards round the garden, with the help of a hoe.

At $1^{1}/_{2}$ years I was travelling round the house and
the stairs on my feet, clinging to furniture or banist
and I could walk round the garden clinging to a ro
I did two miles on the tricycle every two or three da
and in the next 6 months I increased my rides to eig
miles. I was beginning to walk alone, bent over t
sticks, and was learning to bicycle in a narrow corrid
where there is less scope for falling. Most of my time w
still spent lying down. At $2^{1}/_{2}$ years I was walking u
right, with one stick, for two miles or so and doing so
digging and fuel stacking. I had discarded my abdomin
belt. By 3 years I could do extensive heavy work, ri
40 miles on my bicycle, and pull myself up to my ch
on a horizontal bar twice. I still lay down for ha
the day. At $3^{1}/_{2}$ years I could walk ten miles without
stick in five hours and could just get up from a fl
surface, if it was not too smooth, without a stick.

It is now $6^{1}/_{2}$ years since my illness. Progress has bee
slower in the last 2 years or so, from flagging enthusias
and greater demands on my time. I can sit withou
slouching, stand erect, and keep my hips steady when
walk, so my gait attracts no notice. My maximu
speed on foot is five miles in $1^{3}/_{4}$ hours. Stairs are sti
awkward, because I cannot yet stand on one leg with
bent knee.

* * *

From my own experience and other people's, the genera
idea that *early return of voluntary muscle power* is
good sign seems to be justified, for muscles that impro
well at first maintain their lead and can be expected t
become powerful if exercised. On the other hand, state

Letters to the Editor

CHRISTMAS GIFTS

SIR,—I appeal once more to members of the medical ession to help those who are dependent on others extra comforts. The beneficiaries of the Royal cal Benevolent Fund are in such a case. They are aged or infirm practitioners, their wives, widows, children, and, through no fault of their own, find selves in need of help.

I hope that subscribers to the fund will send donations provide a little extra cheer at Christmas time, and I estly beg those who are not subscribers, not only to d Christmas gifts but to become regular supporters of fund. A special effort to obtain new subscriptions urgently necessary because certain medical bodies, h as the panel committees, which used to make erous contributions, have gone out of existence with National Health Service Act.

Donations and subscriptions, marked "Christmas ts," should be sent to the Secretary of the Royal dical Benevolent Fund, 1, Balliol House, Manor lds, Putney, London, S.W.15, and will be gratefully nowledged.

WEBB-JOHNSON
President, Royal Medical Benevolent Fund.

EXSANGUINO-TRANSFUSION IN ACUTE LEUKÆMIA

SIR,—Dr. Maycock (Sept. 18) does not understand what grounds I made the statement that "it is possible to obtain very large quantities of blood at y one time in England." My reason was a simple one: attempt was made and was unsuccessful. True ough, I did not apply to any of the regional transfusion tres: I left that to a junior colleague.

If Dr. Maycock had read my preliminary communica-, he could not have failed to notice that I emphasised , as far as is yet known, the beneficial effect exsanguination-transfusion is only temporary; but, rtheless, the fact that remission does occur suggests mber of fresh avenues of research.

m, of course, grateful to Dr. Maycock for reminding the difficulty of getting certain groups, but I must t that I am well aware of the elementary facts he arly sets out. It is, of course, true that the decision try exsanguino-transfusion in acute leukæmia is ys a difficult one; and, in fact, much of the onus to be placed on the relatives. But what is meant by ing that "exsanguination-transfusions should always deliberately planned in consultation with the regional od-transfusion officer" I frankly do not know. Surely, is the task of the physician to plan the treatment, ays, of course, subject to the availability of the rapeutic agent—in the present case, blood.

London, W.1. A. PINEY.

H. INFLUENZÆ MENINGITIS TREATED WITH STREPTOMYCIN

SIR,—There are two statements in Dr. Smythe's herwise admirable paper of Sept. 25 which may lead to me misunderstanding regarding the value of penicillin eatment in this condition. On p. 485 he writes, with gard to the 12 cases referred to the London Hospital r streptomycin treatment: "In 10 of them penicillin sulphonamides had been administered before admis-n; but these drugs had not controlled the infection d *H. influenzæ* was still present in the cerebrospinal uid or blood." Page 490 contains the statement: Though penicillin combined with sulphonamides does t appear to be so effective as streptomycin it may yet prove useful in combined therapy."

From this it would appear (1) that adequate penicillin treatment had been given to 10 of 12 cases and that this form of treatment had failed where streptomycin succeeded; and (2) that combined penicillin-sulphonamide treatment is inferior to streptomycin therapy either alone or combined. Neither of these assumptions is substantiated in Dr. Smythe's or any other paper published hitherto. As regards (1) it is evident from the case-histories given that 7 out of the 8 cases previously treated with penicillin had been give no intrathecal penicillin or intrathecal inject inadequate amounts. The one case (no. 2) whic adequate penicillin-sulphonamide treatment was p to have a sterile C.S.F. before commencing streptom therapy. It is an open question, however, whether this case complete restoration of health might not hav resulted if streptomycin treatment had been started earlier in the illness.

This comment is not intended to make a case for combined penicillin-sulphonamide treatment as against streptomycin therapy either alone or combined. All one is justified in saying at this juncture is that there seem to be special merits in each of the proposed forms of treatment. Further comparative work appears necessary for the evaluation of and the definition of indications for the various methods of therapy now available.

K. ZINNEMANN.

Bacteriology Dept., School of Medicine, Leeds.

PROPRIETARY MEDICINES UNDER THE ACT

SIR,—Mr. Godding's article of Sept. 18 (p. 465) is interesting, but it leaves out many aspects of the case.

First, I believe that the machinery for investigating excessive prescribing under N.H.I. was prompted by the fixing of a total limit to the drug fund, and when the chemists' accounts rose above this figure they were only paid part. Consequently the chemists were particularly keen to see that the cost came down. Nevertheless, is there any evidence that this machinery has been abused and tended to prevent proper medical treatment? What about the cases on adrenal cortical extract running into hundreds of pounds per annum per case? In one of these cases the doctor wrote to the insurance committee before prescribing and was assured that he could order this. Consequently I feel that the manufacturers of proprietary preparations of the highest ethical standing of this type have little cause for apprehension.

But there is another class of preparation. The Chemists' Federation appears to be trying to impose standards on preparations it admits to its list, which are of course less rigid in the case of ethical proprietary preparations because the doctor is expected to examine their formulæ, &c., more closely than an uneducated patient would do. It does not, however, so far as I know, claim to have vetted all the previous inclusions to the list by the same measure, and, seeing that the federation was principally founded both for price-protection and limitation of sale of medicines to chemists, it cannot completely serve both masters—i.e., the trade and the medical profession. The question of standards should be dealt with by a separate body, free from criticism on this score, on the lines of the American Medical Association arrangement.

Personally I am more interested in the standing of the makers than in prescribing a proprietary article. If, for instance, I order sulphanilamide I do not mind whose make is supplied, provided it is a reliable firm possessing full facilities to ensure that the preparation is proper. I do not like a mixture of say quinine sulphate and quinine alkaloid being supplied for quinine alkaloid, whatever the explanation of the offending firm; but here we are getting off the question of proprietary medicines.

Nor do I like the guarding which still occurs in the formulæ of some proprietary preparations. I am referring to ingredients not in the *B.P.* or *B.P.C.* which on close examination appear to be extracts of mistletoe and the like. What evidence is there that they have any therapeutic effect?

The interest of the federation is to promote the sale of its members' proprietary articles. Is this the real interest of pharmacy? If practitioners are to be encouraged to prescribe proprietary preparations then there is little necessity for pharmacists to be properly trained, and it is in effect a further development of "multiple" pharmacy. Should the chemist be encouraged to keep the raw materials in stock so that he can make, on demand, the exact preparation required by the doctor, charging more for extemporaneous manufacture? Or should he make the patient wait and obtain the preparation ready finished from his supplier? The outcome of this argument is obvious, and is indeed partially

In England Now

A Running Commentary by Peripatetic Correspondents

AFTER reading the correspondence in THE LANCET I have been asking myself just what constitutes a good secretary for a consultant. First, she must be able to take notes at a high speed. For this she will require acute and accent-filter hearing, flexible fingers, courage (the girl who blenches at the thought of confining the shorthand outline for "dysdiadochokinesia" to one line of her notebook won't last long), and a better fountain-pen than has yet been invented. Still more important, she should be able to read her shorthand. She should be able to spell medical terms not only correctly but with that brand of correctness *most acceptable to her employer*—e.g., *clinique*, clinic; leukocytosis, leucocytosis—and her typewriting should be accurate. In medical typescript trifling errors and omissions assume alarming proportions and can be misleading in a manner likely to lower the dignity of the writer: "No puss was found in the urine but some cats were present." A knowledge of Latin is helpful, but the scholarly secretary should never seek to minimise her shortcomings by murmuring in the chief's ear, "*Humanum est errare*"; he would agree that to err is, but not that secretaries are.

It is not desirable that a secretary should have a sense of humour. If, for instance, in a moment of illumination she suddenly sees the heart specialist's reiterated advice to his patient to "learn to take things quietly" as lesson 1 of a correspondence course in burglary, she will be so busy visualising the students, plus masks and dark lanterns and minus boots, striving to take things quietly that she will get the dosage of digitalis wrong; and, unless her chief reads his letters as well as signing them, will probably end on the gallows. She should, however, have enough imagination to tell her what the doctor meant to say when his dictation is more than usually elliptical, but not enough to enable her to identify all the symptoms of all the patients with the sensations experienced and the activities engaged in by her own body.

She must be clairvoyant. How else will she bring to the chief's notice engagements he has omitted to tell her he has undertaken? How else will she "remember" to get the results of an X-ray examination that she didn't know had been done? Above all, how else will she know to refrain from rendering accounts for fees that were paid to him at the time of consultation and never spoken of again? It is useful and sometimes essential to be able to read the chief's writing; but that is asking rather a lot, and I have found that surgeons may even like to be appealed to for an interpretation. They get some sort of psychological kick out of feeling that they have stumped *one*—something akin, I suppose, to having planned the perfect crime. Freud would know.

Consultants sometimes want their secretaries to attend them at hospital, and that brings up a whole series of new difficulties, the most outstanding being the sisters. To cope with these calls for tact, technique, and tolerance; the secretary who can convey the chief's instructions to his ward sister without producing an immediate reaction of resentment to herself as intermediary, antagonism to the idea contained in the request, and obstructiveness to its being carried out, has got what it takes. If she can, in addition, extract from one of the secret sisterhood the information she requires without effusion of blood and tears, that secretary is worth her weight in coal.

Every man had an unblemished medical history, and clinical examination has so far failed to detect any o the many abnormalities listed in the 6-page bookle which has to be duly (why "duly"?) completed. Th swelling totals of "Normal's" and "No's" made m wonder if I was losing my touch. However, the othe day an elderly member of the force came along fo examination with a view to retiring on pension. H had plenty wrong with him, and fruitful results obtained in almost every system. His past reco illnesses filled a typewritten sheet, which showed evidence of illegible writing on the part of his and praiseworthy attempts to decipher it on the of the typist. "Turunculosis" of course was furunc and "Unpitijo" was resolved into impetigo, "Phonjijitis"!—what an admirable term for the j ness which betrays a doctor in non-medical com when the telephone rings! The best we could thi was pharyngitis, but as the would-be "retiree" he never had a sore throat the matter rests here.

* * *

It may not be good for us peripatetic correspon that, secure in our anonymity, we can ventilat opinions without contradiction, or expurgate ou grievances without denunciation—but it is very plea I wonder sometimes how far our identity is suspe Notwithstanding all precautions, the choice of su or some eccentricity of style often betrays a w But though they may suspect, our victims cann sure. So we may mingle with colleagues whose quid we have limned, and sympathise hypocritically their grumbles while inwardly preserving the opi we have recorded.

As I expected, my criticism of eminent lect excited some protests. I am impenitent. A fo lecture, such as those delivered at the colleges, sh be not the mere reading of a manuscript, but a thorou prepared oration delivered with the aid of a few not even none at all. To the silly objection that the Ad has been learnt by heart, I would reply that th following the practice of all great orators inclu Cicero, and is in any case no small achievem Admittedly the preparation demands a great dea trouble, and the performance a great deal of cou The fear of a complete blackout can never be ent absent even in the experienced accomplished perfor yet discipline demands that the lecturer should confident enough to refrain from carrying a manus in his pocket—just in case. The perfect expon is he who is so expert in his subject and so saturated w it that his uninterrupted fluency gives the impress of impromptu delivery. For this not a little of histrionic is essential.

Is it worth while? That must be a matter of opin I know at least three members of our profession have demonstrated their ability to perform such a t de-force, and if they acquire a sense of satisfact commensurate with the admiration of their audien they are well rewarded for their trouble.

* * *

As I am unable to accept [illegible]. I pass on for the use of some more [illegible] read

DEAR SIRS,—I am taking the liberty of writing to you n about if you can sell your body for a small fee to your o university, for medical research work, at my death, can t be so, as 2 Sydney bank clerks told me you could, as my bo at the moment is nicely tattooed mostly all of it, but c you let me know if you will draw up papers to have it do legally by post, or if it can't be sold for a few £s now, s can carry on to be the Most Beautifully Tattooed Man Australiasia, if you won't offer me a price for it, will you as kind to let me know right away if I can will it, at my o request, to have it desected in any way you think at my dea later on, I am 27 years old now.—Your's truly, — —.

* * *

For a tired pædiatrician on holiday it was a joy come on this concluding sentence in a paper on t epidemiology of streptococcal infections in infant "Perhaps someone will be able to repeat these resul in humans."

blood-calcium level may be of value in the diagnosis of pancreatic necrosis. The restitution of the normal blood-calcium level in patients with pancreatic necrosis by intravenous injections of calcium seems to be indicated.

[illegible], Poland.   S. E. LUCZYŃSKI.

COMPENSATION FOR PRACTICES DEPLETED DURING WAR SERVICE

SIR,—In 1939 many general practitioners conceived it their duty to join the Territorials or the Volunteer Reserve of the Royal Navy or the R.A.F., in readiness for an expected blitzkrieg. During their service they lost very heavily financially. The pay of a lieutenant (or flying-officer) was about £380 a year, of a captain (or flight-lieutenant) about £430, and of a major (or squadron-leader) about £640, plus small marriage allowances where applicable. Many had heavy civilian and family commitments to meet.

They returned in 1945 or 1946 to practices which were [illegible] depleted (unless they were fortunate enough to have partners to look after their interests while they were away). In many cases there has been only one full accounting year since their return; in no case can there have been more than two years. For purposes of compensation, therefore, it would be seriously wrong to assess the value of their practices on these difficult first years of the post-war re-start.

It is understood that such cases will be specially considered; but they are so numerous, and so obviously entitled to fair play as a right and not as a concession, that some general principle should apply. I submit that the only fair assessment is to take the pre-war value of the practice, and to add to it a proportion equivalent to the average increase from 1939 to 1947 of the value of the practices of those who, for good or bad reasons, remained behind. This proportion could easily [illegible] out by the tax authorities, but I estimate that it [illegible] about 70%.

Only so can these men who have been penalised for [illegible] war service by loss of income escape being further penalised for that service by assessment of their life's [illegible] at figures which bear no relation to what their [illegible] could have been had they ignored the call [illegible].

PRE-WAR V.R.

HOW MANY NURSES?

SIR,—Your leading article of Sept. 25 deals with [illegible] problems raised in my report on the nursing services.

I venture to suggest that you have failed to appreciate [illegible] essential point in the argument in chapter IV of my report. This point is that the absence of any demonstrable correlation between the nurse-patient ratio and duration of stay in, say, tuberculosis sanatoria in no way invalidates the criterion I have adopted of duration of [illegible] as an index of nursing (or medical) effectiveness. [illegible] does it destroy my hypothesis. Just as the presence of correlation between these variables in general hospitals may be taken to indicate the effectiveness of nursing [illegible] in these institutions, so the absence of correlation in sanatoria may be taken to indicate a corresponding ineffectiveness of nurse training or treatment in sanatoria. Consequently, it is, I submit, incorrect to speak, as [illegible] do, of "conflicting evidence" or "equivocal results." [illegible] the contrary, all the results seem to me to be concordant. Nor is it correct to say that the "only" evidence relates to general hospitals. The fact that the data—the latest available in published form—refer to [illegible] is beside the point.

You say that few will agree with the assumption that duration of stay is an objective measure of the task of nurses and doctors, because duration of stay is also affected by other variables—viz., type of illness, facilities [illegible] investigation and treatment, pressure of waiting-lists, provision of convalescent homes, and quality of diet. Is this not rather like arguing that we cannot judge the health of school-children by their stature, because stature is also affected by hereditary and other factors? My contention (see para. 89 of the report) is that there should be a functional dependence of duration of stay on staffing ratios when all other factors are held constant.

I had hoped that this would be abundantly clear i text. To pursue the analogy, this would be like that the stature of school-children is a measure of health when hereditary and other "disturbing" fac are controlled. Furthermore the report gives conside tion to the possible effect of "other" factors which yo article implies have been overlooked. Indeed, when data are available, evidence is adduced to show that some of these factors (e.g., types of illness) have no apparent effect on the calculations.

Lastly, may I add that that it is no criticism to say that no solution is offered for the immediate nursing shortage. Our terms of reference explicitly excluded short-term palliatives and were confined to long-term measures.

Dept. of Social Studies,
The University, Leeds.   JOHN COHEN.

DIAGNOSIS OF PEPTIC ULCER IN GENERAL PRACTICE

SIR,—The possibility of successful treatment of peptic ulcer varies inversely with the chronicity; hence early diagnosis is most important. In the incipient stages the clinical picture is not always clear-cut, and it is not always practicable, particularly in industrial and in rural practice, for the family doctor, to whom these cases usually come first, to submit each one to radiography, which moreover at this stage is often negative or inconclusive. To meet this difficulty I have for many years used the Gregersen[1] benzidine slide test (G.S.T.) for occult blood in the fæces. It is a modification of the usual laboratory benzidine test in which it is claimed that the sensitivity is reduced so that the ingestion of hæmoglobin-containing food in normal amount does not produce positive results. It is as simply and rapidly carried out as are the usual tests for sugar and albumin in the urine, and is therefore eminently suited to general practice.

When in 1941 supplementary rations were granted for peptic-ulcer patients the opportunity was taken to investigate fully, including the G.S.T., those patients not previously examined who now applied for the requisite forms. My partner and I (the population is mainly industrial) thus made a fairly comprehensive survey of our patients with symptoms of peptic ulcer and other pathological conditions of the alimentary tract.

All cases diagnosed during the past ten years, in which both X-ray and G.S.T. findings are available, have been collected and analysed. There are 123 cases: 102 of peptic ulcer, and 21 of other alimentary conditions. I have omitted all cases of neoplasm in which on first examination the diagnosis was beyond doubt, and I have included a few ulcer cases diagnosed before the period under review, in which there are still active symptoms.

The G.S.T. findings have been compared with the X-ray and clinical findings, including in some cases confirmation after operation. Both the G.S.T. and X-ray findings were positive in 69 (68%) of 102 ulcer cases, and in 18 (86%) of 21 other conditions. The G.S.T. was positive and the X-ray findings negative, but clinical observations and subsequent history confirmed the positive diagnosis, in 19 of the 102 ulcer cases and 3 of the 21 other cases. The G.S.T. was negative, and positive X-ray findings confirmed the clinical findings, in 14 of the 102 ulcer cases, but in none of the 21 other cases. Thus there were 22 cases which might have been missed if the G.S.T. had not been used, and 14 cases in which the G.S.T. did not support the diagnosis.

In more than two-thirds of all cases both the G.S.T. and the X-ray findings were positive. Of these 87 cases, all but 22 were first diagnosed with the G.S.T. Where the two tests gave differing results, the G.S.T. was right rather more often than the X-ray findings: 22 cases and 14 cases respectively. Of the 19 ulcer cases with initial negative X-ray findings, 3 cases radiographed again after an interval because of a persistently positive G.S.T. gave a positive result, and 2 cases, one of neoplasm and the other of diverticulitis, both of them with initial negative X-ray findings and re-examined for the same reason, subsequently gave positive X-ray findings. These 5 cases are perhaps among the most significant in the series.

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[1] Gregersen, J. P. *Ugeskr. Læg.* 1916, 78, 697, 752, 1197, 1260.

evident today. How many pharmacists make such things as Parrish's Food themselves?

Finally I would like to make a suggestion regarding future formularies. From the doctor's point of view a formulary covering the whole country has disadvantages. There was a tablet (tab. febrifuge) in the *North of England Medical Formulary* which was very popular. When the *National Formulary* came into being this tablet's name was first altered and later the strength was halved. Here tab. febrifuge are still ordered, and owing to this name being used on a prescription form the practitioner can get the original formula and the pricing office can deal with the prescription. So in any major alteration of formulæ I would suggest that a new name be adopted for the new preparation so that this can still be the case. I know this cuts across the present accepted views regarding naming (see preface to *N(W)F*) but I have outlined the practical reasons for this modification.

Seaham. A. FORSTER.

CHARMS

SIR,—Dr. Inman's observations (July 10, p. 77) remind me of a case encountered 6000 miles away.

In 1931, when I returned from Great Britain puffed up with the possession of a membership, a railway-ticket collector in my native town of Dadu, Sind, hearing of my recent exaltation, came to consult me. His face was covered with warts—more numerous about his chin, which made shaving an agony. His disappointment was as great as my chagrin when I told him that we, the English doctors, had not yet found a cure except by a knife or caustics which were out of question in his case. After about a month I happened to meet him again and was astonished to see that his face was completely clear of warts. I inquired the name of the remedy, and this is what he said. "Sir, after having seen that even the biggest doctor could not help me, I went to Kotri, a village about 100 miles away, where I had heard that an untouchable class of woman, 'Chuhri,' could cure my disease. She warned me that I would not be able to stand the ordeal, but I assured her that I would. On this she drank some dirty-looking water, gargled, and ejected it in a stream all over my face. Of course my repugnance was extreme, but not so great as my disappointment when you said that you had no cure. She repeated this process for three days, and at the end my face cleared up like magic."

Though amused by this story, I could not but feel humiliated; for the proof of pudding lies in eating, and I had eaten the humble pie.

Bellary, India. P. V. KARAMCHANDANI.

LETTER TO A NEPHEW

The following is the final letter in this correspondence:

MY DEAR UNCLES,

I am very grateful for your friendly concern in my future and for the compliment you pay me in addressing me as a mature, level-headed, person. As such, I hope I may put forward my own views without appearing presumptuous or in any way unheedful of your counsels.

You will understand that I have no preconceived ideas whatever about working within or without a "service"; so I tend to remain unmoved by arguments which are based on these ideas. It seems to me, on the contrary, that a "service" will become what I and my colleagues make it, and that judgment might well be deferred until we have had our chance. In Sweden the profession have made a success of State-controlled medicine, and I see no reason why we should not do as well.

I agree with my old-fashioned uncle that any claim to a vocation would ill become me at this stage; at the same time, I feel that the job most worth doing would be one which most directly concerns itself with the public weal, and this implies ideals of a kind. They are, I hope, appropriate to my age and my capacity, and I shall be very happy to devote myself to their realisation as opportunity allows. I expect help rather than hindrance from the framework of the National Health Service; for, short of assuming that it is designed against the public weal, it must be intended as my servant, not my master. Its aims so far as I can gather, are the same as my own.

Forgive me, but what would you say *if* I suggested that any circumstance whatever might suddenly induce your own patients to regard you as mere "mechanisms" instead of the very able doctors you are? I take it that you ridicule th notion that any change of label or wrapping could affect th quality of your work in the slightest degree; please allow m to feel as unchangeable as you know yourselves to be. If t "practical" view cannot respect this deep conviction of min then I am afraid I feel bound to reject the practical view.

My solemnity must strike you as rather pompous, but thought that I could thank you best by taking your remar very much to heart and answering them with all the [illegible] which I feel they deserve.

Your grateful and affectionate nephew,

CHARLES.

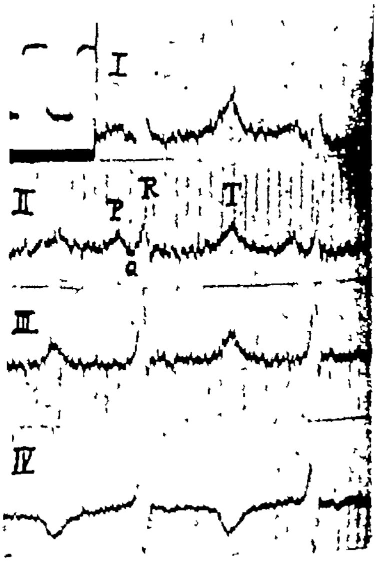
PRIVATE PATIENTS NOT ADMITTED

SIR,—The teaching hospitals, which have consultin rooms available for their medical staff, provide experience analogous to that of allowing private patien in health centres. This is how it works. A patient w known to me was sent a few days ago by her doctor t the hospital to see a consultant. There she was tol that it would be three weeks before she could have a appointment. But she could be seen as a priva patient if she liked to pay three guineas. As she was a good deal of pain she consented, and the time w fixed for two days later. *Incidentally, if she had go* to the non-teaching hospital, which was nearer to h home, she would have seen a better man without del or the payment of any fee.

LAY OBSERVER.

DIAGNOSIS AND TREATMENT OF PANCREATI NECROSIS

SIR,—An electrocardiogram on the sixth day of acu pancreatic necrosis, which had been recognised as su during the patient's life and confirmed by necrops showed a pronounced elongation of the Q–T interv (Q–T = $^1/_2$ sec. with the pulse-rate 80 per min.), increased T deflection, and a slackening of the hear action, without any distinctive signs of damage to th heart muscle (see figure), a type of electrocardiogram which is usually described as tetanic. Thinking that these electrographic changes might be due to a lowered blood-calcium level as they are in tetany, I decided to check this in the next case of pancreatic necrosis, and found both the altered electrocardiogram and a lowered blood-calcium level as expected. The patient was treated with intravenous injections of a 10% solution of calcium gluconate 10 ml. twice daily, con trolled by estimation of the blood-calcium level. Sh began to improve continuously from the first day o treatment and recovered within three weeks.



The lowered blood-calcium level I attribute to th binding of the body calcium at the foci of fat necros and to the lack of absorption of calcium from food becaus of persistent vomiting. I suggest that the formation o foci of fat necrosis causes a lowered blood-calcium level, which in turn intensifies vagal tonus, producing an elongated Q–T interval, increased T deflection, and slowing of the heart. The more numerous and more extensive the foci of fat necrosis, and the faster the rate of their formation, the more pronounced will the electrocardiographic changes be. Consequently electrocardiography coupled with the determination of the not told until after the final appointments have been made. It would avoid much unnecessary suspense if ssful candidates could be informed as soon as short list is selected.

May I also make a plea for a little thought and con- ation towards the candidate, whose time, after all, y be just as important as that of the interviewing mittee. I was recently summoned for an interview telegram and letter, both of which were dispatched y-eight hours before the time of the meeting, but n weeks after the closing date for applications. I pened to be on holiday at the time and received both munications approximately two hours before I was to appear; but as I was in Scotland and the inter- ing committee was in Southern England, we were ble to meet. On another recent occasion I was t waiting, with the other candidates, for two hours the time arranged, because the chairman of the mittee failed to turn up!

REGISTRAR.

MUMPS WITH SEVERE COMPLICATIONS

—That one general practitioner should meet with consecutive cases of mumps with grave complica- within three weeks is rather extraordinary. Both were treated at home.

CASE 1.—A clerk, aged 36, developed bilateral salivary is on July 18, 1947. Five days later he had left tis and epididymitis with considerable constitutional oms, which increased in severity throughout the day. July 23 he developed violent headache, slight delirium, abdominal pain, and half-hourly vomiting, with blood ucosa in the vomit.

On examination the patient was very ill and unresponsive yellowish conjunctivæ, temperature 103·2°F, pulse-rate respirations 24 per min., nothing abnormal in the chest, tender abdomen, especially the left hypochondrium. ine gave a green deposit with Benedict's solution.

pancreatitis was diagnosed. All attempts to give by mouth failed. Vomiting persisted. Pethidine and hyoscine gr. $^1/_{150}$ were given, without producing lief.

July 24 his general condition was much worse, and he less with very severe abdominal pain; left testicle bigger; delirium more continuous; temperature F. A drip infusion of 5% dextrose in normal saline n was set up through a Hamilton Bailey cannula into right saphenous vein. Improvement in the general on was noted within an hour of starting the drip. ine was passed that day. The evening temperature 103°F. 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$ given twice during the night, with great relief and tion in restlessness.

July 25 the patient had had a quiet night and improved h in his general condition. Temperature 101°F. The nt passed urine. A litre of 5% dextrose was given and ond litre, of 10% dextrose, was begun. The patient d to take water by mouth. Vomiting ceased. By the second litre of dextrose solution was finished. pint of concentrated red cells (supplied by the South don Blood Transfusion Service, Sutton) was given, and cannula was removed. There was no abdominal pain headache. Temperature 101·2°F, pulse-rate 86. The nt was drinking well. 'Sodium amytal' gr. 3 was n at night.

On July 26, after a good night, the patient's temperature 98·8°F. Thereafter recovery was rapid and uninterrupted, t for thrombosis of the saphenous vein. Since 10% rose was the only solution available for the second litre ch this is twice as strong as what I normally use) the of venous thrombosis had to be taken.

CASE 2.—A pipe-layer, aged 26, was seen on Aug. 5, 1947, bilateral salivary adenitis. He was not very ill, and tablets of aspirin and opium were prescribed. Next he had right orchitis and epididymitis, with a great in general malaise. Temperature 103°F. A sus- ry belt gave relief. On Aug. 7 the temperature was °F, and the testicle was more comfortable, but the nt complained of abdominal pain, a severe headache nd the eyes, and generalised myalgia.

On examination the right inguinal region was tender, but abdominal wall was lax and not generally tender.

On Aug. 8 the patient began to vomit and t ocular headache became unendurable, making hi and at times shriek out. He had intense photop and two mild jacksonian fits. Nothing abnormal found in the abdomen and chest. Neck rigidity present, and Kernig's sign positive. The pupils react to light, but there was bilateral nystagmus. Temperature 103·6°F, pulse-rate 84. Meningo-encephalitis was diagnosed. Drinks of 5% glucose in small amounts were given. Omnopon gr. $^1/_3$ and scopolamine gr. $^1/_{150}$ half intravenously and half intramuscularly were given, with immediate relief. In the evening the patient was crying with headache, and nystagmus was increasing; he had another fit, with momentary loss of consciousness. Temperature 104·4°F, pulse-rate 68. Omnopon and scopolamine were given subcutaneously.

On Aug. 9 the patient had had six hours' sleep during the night, but the headache was again as intense as ever, and he was vomiting, not drinking, and passed no urine. Temperature 98·2°F. Potassium citrate was given two-hourly. Photophobia increased. Blackout curtains were put up, and two scarves were placed over the patient's eyes. He shrieked if a chink of light showed under the scarves. Lumbar puncture showed the cerebrospinal fluid (C.S.F.) to be under pressure of 160 mm. H_2O; 10 ml. was withdrawn. This was followed by immediate relief. Within ten minutes the scarves were removed from the patient's eyes, the curtains were drawn back, and the patient chatted happily. The C.S.F. contained 12 lymphocytes per c.mm., the other constituents being within normal limits. The patient made an uninterrupted recovery.

Interesting points are: (1) the severe constitutional symptoms in both cases as soon as the testicle was affected; (2) the fact that both patients had orchitis as a prelude to much more grave complications; and (3) in the second case, the fact that, after the fever had dropped by crisis, the symptoms of intracranial pressure increased, and responded dramatically to lumbar puncture.

Haywards Heath. H. DERBYSHIRE BROWNE.

SUBACUTE BACTERIAL ENDOCARDITIS

SIR,—I read Professor Bramwell's article of Sept. 25 with interest. No doubt the most important factor in the prognosis, apart from penicillin, is the duration of the disease. Professor Bramwell and recent American workers have stressed this. I think the lack of close correlation between the in-vitro sensitivity of the organism and the dosage required is intimately related to the duration.

It is well known that small doses of penicillin will rapidly clear the blood of streptococci, and the mechanism is probably a bacteriostatic action associated with circulating antibodies and phagocytes. In the vegetations, which consist of relatively avascular and necrotic masses of platelets, fibrin, and streptococci, penicillin must act predominantly as a bactericidal agent. Obviously, the duration of the disease will largely determine the size and extent of these vegetations, and thus indirectly the dosage necessary. There can be no fixed dosage schemes in the treatment of this condition.

We have at present two cases in hospital who are being given one million units three-hourly for six weeks.

General Hospital, Birmingham. M. J. MEYNELL.

A DIPLOMA IN VENEREOLOGY

SIR,—Like many others from distant countries of the British Commonwealth, I came to Great Britain for postgraduate instruction and additional experience in venereology. Although I have studied, worked hard, acquired knowledge, and gained experience under some of the best teachers of this country, it seems that I must eventually return without taking an examination for a diploma in this particular subject.

Almost every other branch of medicine has some special qualification obtainable by examination—e.g., D.C.H., D.I.H., D.P.H., D.T.M. & H., D.OBST. R.C.O.G., D.P.M., D.M.R., D.BACT., D.O.L., T.D.D., and D.O.M.S. I submit that the institution of such a diploma in venereology would help to raise the standards in a subject which has been greatly neglected by the profession, and whose importance has been shown repeatedly in peace

As regards ulcers only, both tests agreed in two-thirds of the cases; radiography failed in slightly under 1 case out of 5, and the G.S.T. in slightly less than 1 out of every 7 cases. For the other diagnoses the numbers are too small to give more than a strong indication: 11 cases of neoplasm; 5 which exhibited diverticulosis radiologically and had a positive G.S.T. (presumably cases of diverticulitis); and 1 case each of ulcerative colitis, regional ileitis, torsion of the cæcum, spastic colon, and pernicious anæmia.

Some clinicians still believe that, even with the G.S.T., hæmoglobin-containing food should be excluded from the diet for three days before the test. Maclean[2] strongly disagreed, and Ogilvie[3] found that, though meat in the diet might occasionally cause a faint colour with the G.S.T. after 30 sec., a blue or blue-green colour appearing within 30 sec. was proof of the presence of occult blood in the stool irrespective of the patient's diet, provided it had not included foods with a high blood-pigment concentration, such as black pudding, liver, and bone-marrow. However, because opinion on this matter is not unanimous, patients in this series were asked to abstain from meat-containing food for three days before bringing a specimen for examination.

The G.S.T. is *performed as follows:*

Powders are made up containing 0·2 g. of barium peroxide and 0·025 g. of pure benzidine. Put up in waxed paper they will keep indefinitely. Since different makes of reagent give various results, I have used benzidine 'AnalaR' (B.D.H.), which is specifically tested by the manufacturers against a freshly prepared 1 in 100,000 solution of blood. For the test one powder is dissolved in 5 ml. of a 50% solution of acetic acid 'AnalaR.' With a glass rod a small piece of fæces is taken from the centre of the stool and smeared on to a clean glass slide or a piece of white tiling. A few drops of the solution are then run on to the smear. A blue or blue-green colour develops within a minute if the test is positive, and the reaction is graded according to the depth of the colour and the time it takes to develop. Gregersen recognises three grades: +, a pale blue or green colour within 60 sec.; ++, a definite pale blue in 12–15 sec.; +++, a deep blue within 3 sec. Any colour developing after 60 sec. at normal room temperature is disregarded.

The patient is asked to bring a sample of fæces about the size of a bean or a pea, in a clean small jar. The test can then be performed in a few moments during the consultation. The powder, if preferred, can be made up in bulk. In a dark airtight bottle it will keep without deterioration for at least six months. I have tested the powder after that period, and found that it still gave a positive reaction in a 1–70,000 dilution of blood in water. For those doing the slide test for the first time it is advisable to have each powder made up separately till some idea is gained of the quantity needed for each test. It does not take long to learn the approximate quantity required and to tip it into the test-tube either directly from the bottle or with the tip of a spatula. There is no soiling of test-tubes with a fæcal suspension, and since only a small smear of fæces is used it can be easily cleaned from the slide with cotton-wool. In carrying out the test I have found the slides used by bacteriologists for examining hanging-drop cultures most useful.

To avoid so far as possible contamination of the specimen by blood from the rectum, anus, or vagina, it is wise to remove the portion of fæces for examination from the inside of the stool. Should it be necessary to examine fæces at once, some can almost always be immediately obtained by digital exploration of the rectum.

In estimating the value of the G.S.T. it is necessary to consider both its advantages and limitations. For the general practitioner it can be a valuable measure in the early diagnosis and treatment of alimentary ulceration. By its use he can sift and control his dyspepsias with more assurance and a better knowledge of the underlying pathology. Often it may enable him to decide more quickly which case requires the more expensive and time-consuming forms of investigation. By taking appropriate measures till all occult blood has disappeared from the fæces, it may enable him to avert the more serious complications of hæmorrhage and perforation. The minimal amount of blood requir give a positive result varies from one person to ano so a negative finding must not be considered concl and should always be judged in relation to the cli picture. A positive result is always significant; provided precautions have been taken to ex extraneous sources of blood, an attempt must alwa made to trace the cause of the bleeding.

Edinburgh. S. LIFE

HANDLING OF FOOD

SIR,—Both Dr. Stanley Turner's letter of Sep and the correspondence in your issue of Sept. 25 the need for cleanliness in the handling of food employers realised what damage can be done by deplorable methods to which attention has been d they would undoubtedly do something about it. efforts, however, will be nullified unless educatio food-handling is also given to their employees.

In the scheme we have in Guildford the volun efforts made by the employers and employees, in wi coöperation with the council, will it is hoped pro the most satisfactory results. We have frequent m ings between representatives of the health comm *and the food traders, and their employees, and* allows full discussion, in open session, of the reason all we ask in the way of improvement of methods better sanitation in the premises. A representativ the particular food trade is always present to a with the formation of the code of practice for his tr and in this way we can ensure that whatever we pro *in the way of improved conditions is a practical pro* tion. Food-handlers are shown why cleanliness on t part is essential, and how strict attention to cleanli protects the public they serve.

Guildford Hygienic Food Traders' Guild is thriv every trader who complies with the requirement given a certificate of such compliance and of member *of the guild, and every employee is given a* bu badge. By their certificate and badge the public see that the food trader and his assistant know t job and know how to produce clean food in a cle manner. I feel sure that this is the secret of succe the handling of food.

The collaboration of the public is also essential so t *no person suffering from a communicable* dis deliberately contaminates glasses or other articles u for the consumption of food. Education of the pu on these lines is urgently required.

F. A. BELAM
Guildford, Surrey. Medical Officer of Healt

SELECTED FOR INTERVIEW

SIR,—In the past, candidates selected for interv for posts in either voluntary or municipal hospitals h invariably been allowed reasonable out-of-pocket expe as well as train fares, when the distance travelled to place of interview warranted such payments. Ind some local authorities made use of a fixed scale of s sistence allowances based upon the number of hour absence from home. It now appears that, under National Health Service regulations, "there will refunded to candidates their third class railway or fares where they exceed five shillings. *In no circumstan can subsistence expenses be paid.*" (I quote the act words from a recent letter received by myself.) A b study of your advertisement columns, together wit "Bradshaw," makes it obvious that many candida may be away from home for twenty-four hours or e longer, assuming that they are usually selected fr several of the main teaching centres. This latest form economy is particularly mean since the majority vacant posts are in the house-officer and junior regist class, and the candidate for such posts can usually afford to be out of pocket, especially if he fails to appointed.

Secondly, there is considerable, and to my mind qu unnecessary, *delay in informing* candidates for m senior posts when their applications have been uns cessful. At present this delay may be anything up two or even three months from the closing date applications. The usual practice appears to be t candidates who have not been selected for intervi

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2. Maclean, H. Modern Views on Digestion and Gastric Disease. London, 1928.
3. Ogilvie, A. G. *Brit. med. J.* 1937, i, 755.

ted. the water drawn off in due course from various in the building, or even in neighbouring buildings, will polluted. Even if the stop valve is not closed, pollution take place if any leakage or draw-off in the system in the mains has the effect of robbing certain taps of

action which has been taken to deal with these contamination hazards has included: (*a*) correc- of the defects, if practicable, wherever found; amendments to plumbing codes and special regulations g cross-connexions and back-siphonage.

may be asked whether our own plumbing systems appliances may give rise to similar hazards to health. following points may be considered:

) Cross-connexions between potable and unpotable water t approved in our practice, but it may not be correct to that none exist.

The more serious back-siphonage hazards in America due to the combination of flushing valves with mains . The flushing valve is comparatively rare in this and only some of our areas permit mains supply to . It happens, however, that in those areas where is plentiful and can be supplied to taps directly from mains, flush valves are normally more acceptable because is less concern that they may waste water. Any develop- for the increased use of flushing valves, particularly coupled with the use, or greater use, of mains supply, to call for careful thought.

The development of new water-using devices gives in America, lest the hazards of back-siphonage, &c., be introduced. Similar care is needed here, and an that existing appliances, particularly in hospitals, reproach from this point of view.

) Although low-level inlets for baths and the like are no regarded as good practice in this country, it is common tap inlets below the flood rim, though above the . It is very difficult to estimate the degree of hazard, arising from this practice. Repeated inquiry was made ica as to the incidence of cases of contamination which be definitely attributed to tap outlets being above the only. The answer was usually, "We have no data kind. It is not possible, except by chance, to relate such a cause because back-siphonage is intermittent may pollute the water system, and lead to the drinking water, some time later—even in another building. only proceed on the basis of the probability that or later an arrangement which can be shown to permit ination in an experiment which simulates the condi- of practice will actually take place in a plumbing ation. The remedy is so simple and cheap that it should plied."

THE TOILET

The Central Council for Health Education has stated in this country every year there are over 5000 deaths diarrhœa and dysentery and that many of these are no doubt caused by the almost universal of not washing the hands after urination and ation.

In America, in hotels and restaurants of various grades, railway trains, railway stations, cinemas, &c., the ary equipment of toilet rooms was generally noted of a higher standard than in this country. Lavatory , with the important accessories of towels and soap, nearly always to be found close to the water-closet. was most commonly provided through a small tor in the form of a spring tap: several pressings of tap are needed to get enough soap for washing, and is therefore little encouragement to waste. Towels more usually of paper folded in packs (often in cial containers designed to discourage waste) and it rare to find supplies exhausted. A device to provide h towels in such a way that they could be used but removed was as follows:

The towels, packed in a neat pile, each had a chain attached one corner. The other end of this chain was connected to ring which passed over a rod running down into the used towel basket. On being released after use the to automatically into the basket.

There are very few public conveniences in America, it is normal practice for the public to use the toi rooms of hotels, automobile service stations, &c., whethe they are at the time customers of these places or not. This arrangement has advantages as well as disadvantages. In Britain, where hotels do not normally welcome non-patrons in their toilet rooms, the public conveniences are rather irregularly distributed and difficult for the stranger to find; they are often closed when needed, and seldom offer the same inducements to hand-washing after toilet.

Some differences between American and British plumbing appliances and fittings are instructive. The superior flushing of American closet pans merits attention. American practice usually favours cisterns for houses and valves for the larger buildings.

SOIL STACKS

Because of the severity of winters in America, soil stacks in that country are located inside buildings, whereas in Britain they are normally placed outside in order to give greater safety in the event of leakage. Some trouble has occurred in America due to leakages from internal soil stacks but almost no anxiety is felt about them in modern buildings in view of present-day standards of plumbing labour. Perhaps if similar confidence were justified in this country generally, there would be less opposition from sanitarians to internal pipes and concealed pipework.

Food and Drugs (Milk and Dairies) Act 1944

Owing to legal difficulties the Minister of Health will not after all be able to bring this Act into operation this year; in the meantime he asks authorities to renew licences under the Milk (Special Designations) Regulations for the year 1949.

Health in the Second Quarter

The quarter ended June 30, 1948, was remarkable for having the lowest infant-mortality rate (31 per 1000 live births) and the lowest stillbirth-rate (22·7 per 1000 total births) for any quarter on record and the lowest death-rate (10·3 per 1000 total population) for any June quarter. The birth-rate, which like the death-rate is based on the 1947 total population, was 19·0 per 1000, compared with 18·9 in the previous quarter, 21·9 in the June quarter of 1947, 19·1 in June, 1946, and an average of 17·5 for the second quarters of 1942–46. Births exceeded deaths by 93,355, not such a great excess as in 1947, but greater than in 1945 or 1946. Marriages totalled 183,954, which was 6000 under the five-year average. The Survey of Sickness revealed that in January, February, or March this year 67·2% of the people interviewed were either ill or injured, but the loss of work averaged only 1·1 days per month.

Notification of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended Sept.			
	4	11	18	25
Cerebrospinal fever	29	26	26	26
Diphtheria	105	136	126	125
Dysentery	64	84	50	68
Encephalitis lethargica	1	2	1	1
Measles, excluding rubella	2962	2608	2614	2703
Ophthalmia neonatorum	42	53	47	36
Paratyphoid fever	11	32	17	15
Pneumonia, primary or influenzal ..	246	261	283	277
Polioencephalitis	3	4	2	3
Poliomyelitis	70	72	72	70
Puerperal pyrexia	94	79	101	87
Scarlet fever	734	833	925	1068
Smallpox	..	..	..	..
Typhoid fever	9	28	28	29
Whooping-cough	2996	2877	2635	2259

and in war in terms of individual suffering and loss to the community. The need for such a qualification for students from distant lands (Empire as well as foreign) is an additional argument for its institution.

London, E.1. OVERSEAS STUDENT.

TECHNIQUE OF DISCUSSION

SIR,—Some of your readers may like to hear about the conclusions reached at a session of the Sensory Summer School devoted to the subject of democratic discussion. It was agreed that when any committee or other group meets with the aim of reaching agreement on a controversial subject the following improvements on the accepted technique are desirable:

1. That in the initial phase of controversial discussion it is essential to remain receptive to new suggestions and innovations and to treat them from the viewpoint of consolidating and elucidating them before allowing negative criticism, thus enlarging the field of possibly relevant thought.

2. That the method of proceeding by argument around concrete resolutions and their amendments or counter-amendments should be recognised as inefficient and time-wasting. A resolution should be treated as fluid the moment any controversial amendment is proposed, and decision by majority vote should be deferred, if not eliminated, by a readiness to reformulate the subject at issue in terms which may facilitate agreement.

3. That in wording motions it is advisable to avoid both emphatic negatives and positive superlatives which have the effect of ruling out possible alternatives (e.g., phrases such as "The most important point is. . . .").

4. That if opposing sides in a conflict are asked to state all positive elements in their attitude, deadlock may be avoided; or, if deadlock has already been reached, solution may be found by the same method.

5. That every effort should be made to build up a strong tradition of individual self-discipline in discussion, based upon a feeling of responsibility for reaching agreement, keeping in mind at all times the need for positive and relevant statement.

The meeting concluded that any group of people concerned with matters of social organisation or government must, in order to be efficient, both make exact and definite statement of its principles, and at the same time provide methods of continuous self-criticism, developing and re-stating those principles in new terms. A single group rarely, if ever, can fulfil adequately both these functions. An experiment now in progress seems to show that an effective way of doing so is a dual organisation; there should be an executive body dealing with short-term policy and matters of urgency, unhampered by full responsibility for long-term considerations and wider issues, while a sensory body dedicates itself to the deeper implications of truth, principle, and long-term policy. In order to ensure the smooth working of their mutual relationship, the executive should refrain from limiting the scope of the work of the sensory body, and the sensory body should refrain from advising what action should be taken by the executive.

London, W.1. J. N. GLAISTER.

IMMUNISATION AGAINST WHOOPING-COUGH

SIR,—It might be of interest to some of your readers to know that I have seen, in the past twelve months, doing outpatient work at hospital where quite a large number of babies and children have gone through my hands, no cases of whooping-cough. This is attributed in Vancouver to the immunisation against diphtheria and whooping-cough during the period from six months to a year, although of course some children are immunised later. The injections used are made by Connaught Research Laboratories and certainly appear to be highly efficient. When one remembers that the infant mortality for Vancouver varies from 24 to 30 possibly the absence of whooping-cough is a contributing factor.

I thought that your readers would be interested to hear that the absence of whooping-cough is attributed by the pædiatricians to these injections.

DONALD PATERSON
Pædiatrician-in-Charge,
Health Centre for Children.

Vancouver General Hospital,
Vancouver, B.C., Canada.

Public Health

Plumbing in America

AN officer of the Building Research Station has be to study plumbing practice and research in the Unit States, and the Department of Scientific and Industr Research has published a record of his visit.[1]

The "one-pipe" system, in which the waste pi from sanitary fittings of all kinds discharge into a comm pipe directly connected to the drain, is so well establish in America that it has ceased to be the subject of cont versy there. But there are considerable variations its practical application: for example, in two la cities, Philadelphia and Baltimore, special anti-siphon ventilation pipes may be omitted altogether where ea individual waste pipe runs independently to the s waste stack; and elsewhere various degrees of spe ventilation are required.

HAZARDS

Contamination of drinking-water due to cross-c nexions and back-siphonage into water lines has b much attention since the epidemic of amœbic dysent in Chicago in 1933, when 1400 people were ill and died through drinking water contaminated in two la hotels. Investigation has revealed many cases of wa being rendered unsafe after arrival in the plumbing syst of a building, and ill health has often been shown to directly attributable to "pollution in the plumbin In consequence, certain plumbing practices at one ti normal in America have been amended. Speak generally, those found dangerous are:

(*a*) Any cross-connexion between a supply of potable wa and a supply of unpotable water by means of a valve of kind. The more serious cases have arisen where the unpot water was sewage. There have been cases of potable wa supplies being used for flushing drainage pipes by mean a value connecting the water-supply and sewage systems. hazard in any such case of "cross-connexion" is that if valve is opened, or fails to give complete closure, at a ti when the pressure on the polluted water side of the va happens to exceed that on the potable water side, the pota water will become contaminated.

(*b*) Any case where water is supplied to a washing or sanit appliance, or other water-using device, in such a way t the outlet of the supply—e.g., the outlet of a tap or of extension pipe attached thereto—is below the level to wh waste water in the receiving vessel may rise. (In determin this level account must be taken not only of normal us but also of exceptional conditions such as stoppage of overflow channel. Hence the level to be considered is that which water would begin to flood over the top edge of appliance.)

The way in which hazards to health arise in the c of simple cross-connexions has already been noted. T hazard associated with the "submerged" or "und water" inlet, is as follows:

> Negative pressures necessarily occur from time to time the water-supply systems of buildings. For example, if stop valve controlling the supply to a building is closed wh repairs are in progress, any water drawn from the system the house side of the stop valve must come from the wa remaining in the pipes, and as this water falls it induce negative pressure of air in some part of the pipes. If there any submerged inlet it may, by reason of the negative pres in the pipes leading to it, siphon out waste water from t appliances which it serves. For this to happen, the cont tap at the submerged inlet must either be left open or be n completely airtight; but there are many circumstances which taps may be left not completely closed, and cert water-control devices would in any case permit water to p through them in a reverse direction. If the water in t appliance served by the submerged inlet happens to

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[1] Plumbing in America. National Building Studies: Spec Report no. 2. H.M. Stationery Office. Pp. 24. 6d.

on producing this valuable booklet so promptly, and at modest price of half a crown. It is a worthy successor to *B.D.H. Guides* of 1914 and 1932.

versity of Aberdeen

On Sept. 29 the following degrees were conferred :

M.D.—E. K. Cruickshank, C. E. Lumsden (with honours); A. McCredie Smith (with commendation).

M.B., Ch.B.—Eric McKay, W. G. Smith (with honours); ne C. Budge, Valerie A. Cowie, A. M. C. Duffus, G. P. ir, Doris I. Manson, M. D. Paterson, Margaret P. B. Reid, G. G. Shepherd (with commendation); R. G. Blues, A. J. Booth, re Bruce, A. R. Burnett, R. F. Cant, G. T. M. Cummins, dy J. A. Davie, A. M. Donaldson, I. McI. Duguid, Leslie bar, A. H. Duncan, G. D. Duncan, John Duthie, H. W. McG. ards, Margaret Farquharson, A. J. B. Gibb, Margaret G. Hay, A. Hendry, Margaret R. Inglis, A. G. Jessamine, A. G. Laing, phine M. Lomax-Simpson, A. H. Lorimer, A. C. MacDonald, A. McIntosh, W. T. D. McKenzie, Ian MacLeod, June M. Taggart, P. T. Main, Doreen Meldrum, Irene Milne, Joan M. , J. C. Mitchell, Douglas Mortimer, T. D. Ness, Norna Pringle, G. Richmond, R. S. Ritchie, J. A. Shanks, Elma M. Simpson, h M. Skea, R. W. Smith, Elizabeth M. Somerville, Helen M. tter, Elizabeth M. Spark, Cecily J. M. Stewart, D. B. Strachan, n R. Struan-Marshall, Audrey Sutherland, James Symonds, beth H. Thom, Margaret H. Thomson, James Wilkie, G. G. mle.

yd Roberts Lecture

On Thursday, Oct. 28, at 4.30 P.M., Mr. R. M. Titmuss will ver this lecture at the Whitworth Street branch of Mary's Hospitals, Manchester. He is to speak on nthood and Social Change.

don Association of the Medical Women's Federation

The annual general meeting of the association will be held the Royal Free Hospital School of Medicine, Hunter eet, W.C.1, on Tuesday, Oct. 12, at 8.15 P.M., with Miss elyn Moore, the president, in the chair. (The ordinary ices have gone astray in the post, and members are refore asked to accept this announcement.)

rnational Congress of Ophthalmology

A list of doctors practising ophthalmology in Great Britain ing compiled for the new Indicia in connexion with this oming congress. All those who are *not* members of the ty of Ophthalmologists or the Ophthalmological Society United Kingdom are asked to send their names, quali- ns, and addresses to the honorary secretary of the , 45, Lincoln's Inn Fields, London, W.C.2.

nal Hospital Boards

Minister of Health has made the following appoint- ts:

th-West Metropolitan.—Dr. W. J. T. Kimber, medical super- dent of Hill End Hospital, St. Albans (in succession to Dr. J. R.).

lsh.—Mr. E. K. Roy Thomas, senior ophthalmic surgeon to Swansea General and Eye Hospital (in succession to Dr. J. Lloyd ies); Mr. J. T. Morrison, dean of the faculty of medicine, versity of Liverpool (in succession to Prof. T. B. Davie). Mr. rison is also a member of the Liverpool Regional Hospital ard.

ffield Medical Fellowships

For the past few years the Nuffield Foundation has offered lowships in child health, industrial health, social medicine, l psychiatry to those who wish to qualify for an academic reer as teachers and research-workers. In all there have en 121 applications and 18 fellowships have been awarded. t their meeting in June the trustees decided that the time d come to widen the scope of the scheme to include all lls of medicine while still giving special consideration to plications for additional training in the four original bjects. Further particulars will be found in our vertisement columns.

dical Protection Society

Dr. A. R. French has been appointed secretary to the society succession to Dr. R. W. Durand, who has resigned to take p the post of superintendent of Belfast City Hospital.

Dr. French was educated at Epsom College and the London Hospital. After taking the Conjoint qualification in 1927 he spent e time in general practice before taking a short-service com- ssion in the medical branch of the Royal Air Force. He then went k into general practice in Greenford until he was called up in ptember, 1939. He served throughout the war and was for some e the officer in charge of the R.A.F. medical statistical office. After his release he studied industrial medicine and took the D.I.H. st year. He has been honorary secretary of the local division l of the Metropolitan Counties branch of the British Medical ociation. He is also a member of the Medico-Legal Society, and he has served with the Pensions Appeal Tribunals.

Royal College of Obstetricians and Gynæcologis

The Dowager Lady Reading, at the annual dinner of the R College of Obstetricians on Oct. 1, paid great tribute to th who specialise in midwifery and the diseases of women. The are moments, she suggested, when they appear as demi gods. In responding, Sir William Gilliatt, the president, told how the list of candidates for membership of the college has grown, from 84 in 1938 to 294 in 1948; and reminded his hearers how the college itself, presented sixteen years ago by Sir William Blair-Bell, had seemed grandiose then, but was now too small for the growing body using it. He referred to the help given by the college in reserving appointments for Dominion postgraduates who come to Great Britain for experience. Last year appointments were reserved for 6 nominated Dominion postgraduates, and additional appointments were found for 9 others who came unexpectedly.

Dr. Emil Novak, president of the American Gynecological Society, replying to Mr. V. B. Green-Armytage who proposed The Guests, was pleasant about any language difficulty which his hearers might experience; indeed, he said, there had been a language difficulty in his own family, for his wife came from Boston, and his son spoke a hybrid tongue. He had that afternoon been made an honorary fellow of the college, to which he brought a gift from the American Gynecological Society—a gavel, made from two door-knobs and a part of a newel-post taken from the house of Ephraim McDowell, the father of ovariotomy. In accepting the gavel on behalf of the college, the president remarked that another fifty years had passed before Spencer Wells did his first ovariotomy in England—though he had subsequently made up for lost time.

Sir Henry Dale, F.R.S., newborn president of the Royal Society of Medicine, claimed leave to suffer from eloquence, the occupational disease of presidents, and described how ergot, and the studies he made of it, had brought him into touch with all sorts of eager minds and famous men; and Prof. Newell W. Philpott, of McGill University, spoke kindly of the help the college had given its friends the Canadian obstetricians and gynæcologists in organising their affairs. He begged for more visits from British gynæcologists.

Middlesex Hospital Medical School

Presiding over a gathering of some 300 people at the annual dinner held in London on Oct. 1, Mr. Maurice Whiting spoke of some of his teachers—John Murray, Sir Gordon Gordon-Taylor, William Lang, and Sir Robert Young. When he entered the hospital in 1907 he was told that patients liked to go to Middlesex because they were treated with care and consideration as well as skill. Such a tradition was worth maintaining. The present position of the medical school was, he felt, largely due to the work of three of its deans, Campbell Thomson, Lord Webb-Johnson, and Dr. Boldero, all of whom had done so much in their several ways. Of a hospital it might be said that the ship was more than the crew, but the ship and crew were one. He hoped that when the Middlesex ship made its voyage into new and uncharted seas the crew would preserve its reputation. Dr. H. E. A. Boldero drew attention to the presence of Prof. Lillian Penson, the first woman vice-chancellor of the University of London and the first woman to attend the Middlesex Hospital dinner. Under the N.H.S. Act, he said, three hospitals had been added to the Middlesex—the Woodside Hospital for Functional Nervous Diseases; the British Red Cross Society's Clinic for Rheumatism, Peto Place (now renamed the Arthur Stanley institute of the Middlesex Hospital); and the Hospital for Women in Soho. He welcomed these hospitals and the great opportunities they brought. Though the medical school now had its separate charter it would remain as closely in touch as before, especially as Colonel J. J. Astor was chairman both of the hospital and of the medical school council. Dr. R. S. C. Couch, as senior Broderip scholar, spoke regretfully of the recent call-up arrangements which would deprive many of his contemporaries of the chance of holding a B2 hospital appointment. Turning to rather lighter topics, he described the invasion of the medical school by women students and seemed to think it might advantageously be carried further. Mr. E. W. Riches concluded the speeches by expressing some of the admiration and affection in which the chairman is held by his colleagues and former students.

Obituary

ALEXANDER WILSON GILL

M.D. EDIN., F.R.C.P.

Dr. Wilson Gill died on Aug. 30, at the age of 60, in the North Staffordshire Royal Infirmary, where till his retirement this year he was in charge of the neurological and cardiological clinics and was senior physician.

He was educated in Edinburgh at the Royal High School and the University, graduating in medicine in 1909. After holding resident appointments at Addenbrooke's Hospital, Cambridge, and the City Infirmary, Birmingham, he obtained his M.D. Edin. in 1912 with a thesis on auricular fibrillation, and then settled in practice in Hanley as the partner of the late Mr. Reginald Alcock. During the 1914–18 war he served in France and Belgium, and when he was wounded showed the courage characteristic of his whole life. With the late Sir Arthur Hurst he became interested in the study of functional diseases in soldiers, and for a year he acted as neurologist at Seale Hayne Military Hospital. He was also assistant editor of the *Seale Hayne Neurological Studies*. On his return to general practice he successfully treated functional disorders by hypnosis.

In 1922 he was elected to the staff of the North Staffordshire Royal Infirmary, and after taking the M.R.C.P. in 1927 he undertook only consultant work. In 1944 he was elected F.R.C.P. His advice was sought particularly on functional as well as organic neurological states and cardiovascular diseases, but he never lost interest in general medicine. A colleague says of him that "he never failed to give comfort to his many patients, both in the lay and medical world. He had a keen understanding and sympathy and imparted confidence with his fluent and explicit diction. There was never a more honourable, upright, and kindly man than Alec Gill, and during his last illness it was often said that he practised what he preached, for he made friends of his fears and faced a difficult situation with fortitude. A great lover of Johnson and Boswell, he spent his spare time either reading the classics or fishing. In his younger days he was a tennis enthusiast."

Mrs. Wilson Gill was formerly Miss Edith Mary Johnson, of Congleton.

Births, Marriages, and Deaths

BIRTHS

CURTOIS.—On Sept. 23, at Singapore, the wife of Lieut.-Colonel G. M. Curtois, R.A.M.C.—a son.

DOCKRAY.—On Sept. 24, the wife of Dr. J. V. Dockray, O.B.E.—a daughter.

HUMPHREY.—On Sept. 25, the wife of Dr. J. H. Humphrey—a daughter.

MARSHALL.—On Sept. 28, at Oxford, the wife of Wing-Commander A. B. Marshall, M.R.C.S.—a daughter.

STIDOLPH.—On Sept. 27, in London, the wife of Mr. Neville Stidolph, F.R.C.S.—a son.

TOBER.—On Sept. 28, in London, the wife of Dr. Archibald Tober—a daughter.

TURNER.—On Oct. 1, in Edinburgh, the wife of Dr. R. D. Turner—a son and a daughter.

WILLIAMS.—On Sept. 26, in London, the wife of Dr. R. E. O. Williams—a daughter.

YORKE.—On Oct. 2, in London, the wife of Dr. Allan Yorke—a son.

MARRIAGES

FRANCIS—WARREN.—On Sept. 9, at Bromley, Arthur Evans Francis, M.D., to Maria

INGRAM—FORBES, at Montana, Switzerland, George Ilsley Charlton Ingram, M.B., to Patricia Margaret Forbes Irving.

McKENZIE—BUCK.—On Sept. 30, at Birchington, James Alexander McKenzie, M.B., to Joyce Isabel Buck.

MAILE—KELLY.—On Sept. 25, in London, William Burgess Drayson Maile, M.D., to Mary Sheila Bridget Kelly.

PRITCHARD—LEE.—On Sept. 25, in London, John Pritchard, M.R.C.S., to June K. Lee.

WYPER—VERITY.—On Sept. 22, in Edinburgh, John F. B. Wyper, M.B., to Margaret Janet Verity.

DEATHS

AUBREY.—On Sept. 30, Harold Percival Aubrey, M.R.C.S., aged 66.

COSGRAVE.—On Sept. 30, Frederick Robert Cosgrave, M.D. Dubl.

NASH.—On Sept. 29, at Ashwell, Herts, Lorimer Gifford Nash, M.R.C.S.

SASS.—On Sept. 30, at Deal, Frederick Joseph Wilfrid Sass, M.R.C.S., D.P.H.

Notes and News

UNIVERSITY STIPENDS

LAST week Prof. C. E. Raven, D.D., in his address to t senate at the beginning of his second year as vice-chancell of Cambridge University, discussed the growing discrepan between the incomes which could be earned in the universiti and in other professions. The University Grants Committ had lately pointed out that the maximum professorial sala which the Treasury recognises is £1450. If there was to any ladder of promotion this meant that junior posts wou hardly carry a living wage—certainly not a wage on whi to marry and bring up a family. After six years of natio service, men who held fellowships or junior teaching po were being paid at the age of 30 salaries hardly larger th those offered in 1939 to men of 23. And these discrepanc would be aggravated, he pointed out, when the findings of t latest Spens report were implemented. For instance, t stipends of Cambridge professors did not rise above £15 but a specialist appointed to the staff of a hospital was to guaranteed a salary rising to £2500 at the 1939 value of mon "If the salaries of our own teachers of medicine are to raised to the figures specified in the report," Dr. Rav continued, "we shall have anomalies in the scientific depa ments of the university which will not only be absurd b intolerable. It seems obvious that the University Gra Committee will have to reconsider the decision which has at present upheld; or else we shall have to qualify the medical school."

A SCOTTISH HOSPITAL

Dr. Gibson, the present medical superintendent, tells t story of the Dundee Royal Infirmary[1] from its lowly ori as a local dispensary about 150 years ago, describing development into one of the finest institutions of its ki Like all human institutions, it has had its vicissitudes; b it has always commanded the help of able and willing m and women. All classes of the community have contribut something to this, and some of Scotland's most distinguis physicians and surgeons have served on its staff. In Gibson the hospital has found a biographer as interest as he is devoted.

VITRELLÆ

THE joint committee of the British Medical Association of the Pharmaceutical Society of Great Britain which been compiling a *National Formulary* has been seeking convenient name for that group of therapeutic agents wh are inhaled after crushing a small glass capsule. To disting these preparations from the "inhalations," and from capsules intended to be swallowed, which form distinctive quite different groups, the word "vitrella" has been cho as being both precise and descriptive. It is proposed to u this title for this class of preparation in the formulary. Befo long, therefore, we shall be ordering "Vitrella amylis nitri min. 3."

THE B.P. 1948 EXPLAINED

A NEW pharmacopœia is scrutinised as carefully as t results of a general election—and the emotional accompa ments are not dissimilar. In the *B.P. 1948* new drugs a preparations are conveniently tabulated; and there are li of those which have been relegated to another place (oft the *B.P.C.*). But there is never a word about pharmacologic actions—a double misfortune for readers unfamiliar with ne official names, even though the compounds may be old frien in new guise. Discussion of the actions of drugs is still le to the writers of textbooks of pharmacology. In these difficu days, however, publishers of textbooks can rarely synchroni the release of new editions with the appearance of a new *B.F* even if authors would always coöperate. *The B.D.H. Gui to the B.P. 1948* is therefore particularly welcome. Fro this slender volume (pp. 145 + xiv) containing notes on th official monographs arranged alphabetically, the doctor pharmacist can see at a glance whether a preparation is a old one, wholly or to all intents unchanged: an old on altered in strength or composition (*); or a new on altogether (**). When necessary a few words are added o pharmacological actions, and drugs which come under th D.D.A. or regulations or on the poison schedules are clearl indicated. The British Drug Houses Ltd. are to be congratu

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[1] The Story of the Old Infirmary: Dundee Royal Infirmar (1798–1948). By H. J. C. GIBSON, M.D.

STREPTOMYCIN THERAPY OF TUBERCULOUS MENINGITIS IN CHILDREN

K. CHOREMIS
M.D. Athens
PROFESSOR OF PÆDIATRICS AND DIRECTOR OF PÆDIATRIC CLINIC, UNIVERSITY OF ATHENS

N. ZERVOS
M.D. Pisa
ASSOCIATE PROFESSOR OF PÆDIATRICS TO THE CLINIC

V. CONSTANTINIDES
M.D. Athens
SENIOR ASSISTANT PHYSICIAN

S. PANTAZIS
M.D. Athens
CHIEF OF BACTERIOLOGY DIVISION OF THE CLINIC

FROM April 1 to Nov. 30, 1947, 72 cases of tuberculous meningitis were treated in the Pædiatric Clinic of the University of Athens. Of these cases 13 began as miliary tuberculosis and 59 as a severe primary infection with, in some cases, a perifocal spread. Thoracic spondylitis was present in 3 cases, and 1 case was a sequel to cervical adenitis.

In 9 cases no streptomycin was given and death ensued. Streptomycin was given to the remaining 63 patients (tables I and II). Combined intramuscular and intrathecal therapy was applied routinely, and intrathecal therapy was regarded as indispensable. Of these 63 patients, 34 died and 29 survived. In almost all our fatal cases necropsy was refused.

Enough patients have survived for a sufficient period to allow us to observe phases of tuberculous meningitis which in pre-streptomycin days were very brief or, in most cases, never seen. We feel that the full potentialities of streptomycin will not be disclosed until the dosage, method of administration, and duration of treatment are correlated with the clinical and biological progress of the disease.

Four factors must be considered together in planning the attack with streptomycin and in managing the course of treatment: the antibacterial power of streptomycin; the acquired resistance of *Myco. tuberculosis* to streptomycin; the toxic effects of streptomycin; and the stage of the disease at which treatment is begun. Our investigations have been directed towards elucidating the relationship between the third and fourth factors and the progress of the tuberculosis, for here, we believe, lies the secret of the best use of streptomycin.

We are not impressed with the significance of the presence of *Myco. tuberculosis* in the cerebrospinal fluid (C.S.F.). We have evidence, both from our own experience and from that of others, that the finding of this bacillus in the C.S.F. is not inevitably followed by tuberculous meningitis. We lately reported [1] cases of meningism, with *Myco. tuberculosis* in the C.S.F., associated with primary tuberculosis in children, where no meningitis developed and with no specific treatment the children recovered in a few days. We have also recently discharged patients who have had tuberculous meningitis treated with streptomycin and whose clinical condition and C.S.F. findings have become normal except for the continued presence of *Myco. tuberculosis* in the C.S.F. After varying periods there has been no relapse in these cases and certainly there has been no immediate recurrence of the meningitis.

DOSAGE

Opinions vary considerably about the dosage of streptomycin in tuberculous meningitis. At first we gave 2 g. of streptomycin daily, but later we reduced the dose to 1 g. daily or even less. The optimum dosage depends on the patient's age and on the stage of the disease. Both intramuscular and intrathecal administration were used (tables I and II), and we are now satisfied that the more severe the signs the smaller should be the intrathecal dose. Thus, to an infant with advanced tuberculosis we would give 0·5–0·6 g. daily, of which 0·05 g. would be intrathecal and the rest intramuscular. The intrathecal dose may even be less than 0·05 g. —sometimes as little as 0·01 g.

DURATION OF TREATMENT

Here again there is great difficulty, but in our experience three or four months is the average period during which streptomycin will exert its main therapeutic effect. We combine continuous and intermittent administration to put off for as long as possible the acquisition of tolerance of streptomycin by the bacillus and to avoid the unwelcome effects of protracted intrathecal injection.

In general we give about four to six weeks' initial treatment, both intrathecally and intramuscularly. We usually find a well-marked amelioration of signs and symptoms at the end of this, but laboratory reports show that tuberculosis is still present. We call this the *period of clinical improvement.*

We next discontinue treatment for five to ten days, after which we resume treatment for ten to fifteen days. There follows a further rest period and then further treatment as before, and this phase of intermittent treatment may go on for as long as three months. Our treatment in this phase depends on the laboratory findings, for as a rule the patients by now show no evidence of meningitis. We call this stage the *stage of laboratory restitution.*

We agree with other observers that, after the first and acute stage is over, the patient's clinical appearance is no indication for stopping treatment. Further, while the cell-count and biochemical findings show that the C.S.F. is still abnormal, the probability, perhaps even certainty, is that the child will have an exacerbation. Therefore, while the C.S.F. findings show any signs of tuberculous meningitis the treatment must go on.

METHODS OF ADMINISTRATION

It is known that streptomycin has a local effect. We have seen immediate regression in cases of adenitis and fistulæ under local streptomycin therapy. Nevertheless, some workers have queried the desirability of intrathecal administration and have used only the intramuscular route. The irritant effects of streptomycin on the theca have been confirmed by our experience. Intrathecal streptomycin leads to an increase in the amount, the cell-count, and the albumin content of the C.S.F., and a long series of intrathecal injections may cause complete obstruction of the spinal canal.

Advanced tuberculous meningitis always produces an acute hydrocephalus, and the paralytic stage follows. Therefore, in view of the known tendency of intrathecal streptomycin to irritate and bring about blockage of the cerebrospinal canal, the risk of aggravating a natural tendency of the meningitis should be kept in mind. At the start of our experiments, when large doses (0.1 g. or more) were given, we have seen an aggravation of meningitis, including hydrocephalus, under the influence of intrathecal streptomycin, and death has been accelerated in this way.

Yet we believe, with others, that intrathecal therapy is indispensable in the treatment of tuberculous meningitis. We tested the intrathecal action of streptomycin on three physically healthy children, with the results shown in table III. In other cases we have noted that continuous intrathecal injection leads to blockage of the flow of C.S.F. to the point of occlusion and dry puncture. We can only regard this as the result of injury to, and irritation of, the meninges; in fact a necropsy showed a local traumatic adhesive meningitis completely interrupting the flow of C.S.F. Since we began intermittent treatment we have not observed any blockage at all.

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[1] Choremis, K., Vrachnos, G. *Lancet*, Sept. 11, p. 408.

Society of Medical Officers of Health

At a meeting of the society to be held on Thursday, Oct. 14, at B.M.A. House, Tavistock Square, W.C.1, at 5.40 P.M., Prof. R. H. Parry will be installed as president and will deliver his presidential address.

Royal London Homœopathic Hospital

The King, who is patron of the London Homœopathic Hospital, has commanded that in future it shall be known as the Royal London Homœopathic Hospital. The hospital will celebrate its centenary next year.

St. John's Hospital Dermatological Society

Dr. J. M. H. MacLeod will deliver the Prosser White oration at 1, Wimpole Street, London, W.1, on Thursday, Oct. 28, at 4.30 P.M. The title of his address is Milestones on a Dermatological Journey. A dinner will be held the same evening. Further particulars may be had from the secretary of the society, St. John's Hospital, 5, Lisle Street, W.C.2.

Royal Institute of Philosophy

In the Michaelmas term a course of lectures on Foundations of the Moral Life will be given at the institute, 14, Gordon Square, London, W.C.1, on Fridays at 5.15 P.M., beginning on Oct. 15. Cards of admission may be had from the director of studies at the institute. Viscount Samuel will deliver his presidential address at 5.30 P.M. on Oct. 20. He is to speak on the Decline or Revival of Religion.

British Association of Plastic Surgeons

The clinical congress held by the association, under the presidency of Prof. T. P. Kilner, at Oxford and Stoke Mandeville from Sept. 16 to 18 was attended by 91 plastic surgeons, including visitors from America, Sweden, Norway, Belgium, Ireland, Denmark, and South America. The guest of honour was Dr. Sumner L. Koch, of Chicago, who gave an address on Surgery of the Hand.

Proper Use of the Health Service

Mr. Aneurin Bevan, Minister of Health, addressing the British Hospitals Contributory Schemes Association on Oct 1, said that the National Health Service would fail unless the people used it intelligently, sparingly, and prudently. As reported in the *Times*, he added: "There is as much need for prudence on the part of the profession in giving the benefits of the service as there is for the population in the claiming of those benefits."

King's College Hospital Medical School

The annual dinner was held in London on Oct. 2, after the formal opening of the medical school on the previous day. Prof. Henry Cohen, who had delivered the oration at the opening ceremony, was the guest of honour, and emphasised that though the increasing number of committees these days was a heavy burden to bear it was important that the responsibility should be accepted, for that was the only means whereby *medical men might influence their future.* Mr. Harold Edwards, the dean, pointed out that the changing needs of today necessitated considerable modification of the curriculum. Among other guests who attended were the non-medical members of the recently constituted council of the medical school, including the Marquis of Normanby, the new chairman of the hospital.

Award for Gallantry

The King has awarded the Albert Medal to Dr. A. R. C. Butson, a member of the Falkland Islands Dependencies Survey, in recognition of his gallantry in the following circumstances:

> On the evening of July 26, 1947, an American member of the Ronne Antarctic Research Expedition fell into a crevasse some 6 miles from base. Two teams were sent to the rescue, but the hazards of crossing a heavily crevassed glacier were much increased by darkness, and it was not until 4 o'clock on the morning of July 27 that the crevasse into which the American had fallen was located. Butson immediately volunteered to be lowered into the crevasse where he found the American tightly wedged 100 ft. down and suffering from shock and exhaustion. For nearly an hour he had to chip the ice away in an extremely confined space in order to free the American, who was brought to the surface and placed inside a tent. Butson then rendered the necessary medical aid and at dawn a return to base was made carrying the American on one of the sledges.

Dr. Butson, who is a Cambridge graduate, qualified from University College Hospital in 1945.

Appointments

DONOVAN, G. E., M.D., M.SC. N.U.I., D.P.H.: divisional M.O., W Glamorgan.
DURAND, R. W., M.R.C.S.: superintendent, Belfast City Hospit
HOLME, THOMAS, M.B. Manc., D.P.H.: divisional M.O.H., Stalybrid and Dukinfield, Cheshire.
TAYLOR, G. H., M.D. Lond., D.P.H.: deputy county M.O.H. a deputy school M.O., Warwickshire.

Fulham Hospital:
COMERFORD, R. E. W. B., M.A., M.B. Camb., D.A.: senior resid anæsthetist.
MCSWEENEY, TERENCE, M.B. N.U.I.: casualty officer.
WALLACE, D. M., O.B.E., M.S. Lond., F.R.C.S.: part-time regist. to genito-urinary department.

University of Wales:
Asst. M.O. for student welfare:
GRANT, GRAHAM, M.B. Lond.
WILLIAMS, LILIAS, M.B. Edin., D.P.H.

Diary of the Week

OCT. 10 TO 16

Monday, 11th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. F. S. Cooksey: Rehabilitation and Surgery.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8 P.M. Annual general meeting.
8.30 P.M. Dr. T. Jenner Hoskin: Thyrotoxicosis. (Presiden address.)

Tuesday, 12th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. Desmond Curran: Prefrontal Leucotomy. (F Croonian lecture.)
ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. R. C. Brock: Surgery of the Heart and Gi Vessels.
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histology of the Skin.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate Terr S.W.7.) Dr. Geoffrey Evans: Empiricism in Medici

Wednesday, 13th

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. J. R. Learmonth: Pathological Physiology Peripheral Arterial Disease.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Port Place, W.1
3.30 P.M. Dr. W. G. Wyllie: Weaning and Mixed Feeding of Infant.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn R W.C.1
10 A.M. Mr. J. D. McLaggan: Treatment of Cardiospasm.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) Dr. Paul Baci Experimental Corneal Grafting.

Thursday, 14th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. Curran: Prefrontal Leucotomy. (Last Croon lecture.)
ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. Denis Browne: Surgery of Congenital Deformi of the Extremities.
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Sir Stanford Cade, Dr. J. L. Dobbie, Mr. W. D. Harm Carcinoma of the Buccal Cavity.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. H. J. Wallace: Erythematosquamous Eruptions
SOCIALIST MEDICAL ASSOCIATION
7.30 P.M. *North West Middlesex Branch.* (Town Hall, Wemble Dr. E. H. Capel: An Industrial Health Service.

Friday, 15th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. T. Holmes Sellors: Surgery of Pulmona Tuberculosis.
FACULTY OF RADIOLOGISTS
2.15 P.M. *Therapy Section.* (Royal College of Surgeons.) Mr. A. Durden Smith, Dr. J. R. Nuttall, Mr. G. W. Blomfiel Palliative Treatment in Advanced Breast Cancer.

Mr. Aneurin Bevan, the Minister of Health, has appoint Mr. J. E. Beddoe to be his principal private secretary.

On Oct. 15 Dr. J. F. Brailsford will reach New York begin a lecture tour in the United States during which he w address the Annual Meeting of Radiologists at San Francisc

CORRIGENDA.—*Exchange Transfusion in Hæmoly Disease of the Newborn* (Oct. 2, p. 522). Dr. Mollison co-author is Miss Marie Cutbush, B.SC.

In our note last week on Dr. J. V. Dacie's appointme as reader in hæmatology at the Postgraduate Medic School of London, the word *hæmostatic* should have be *hæmolytic*.

and respiratory disturbances going on perhaps to Cheyne-Stokes breathing; the persistence of any of these is an indication for the absolute cessation of streptomycin therapy; cisternal puncture is the only useful palliative measure. If the signs improve, small daily intrathecal doses (beginning, say, with 0·01 g.) may be started and slowly increased, so long as none of the above signs and symptoms recurs. It may be necessary to keep the dose minimal for many days, but we have observed that, when the crisis has safely passed, the intrathecal dose can be increased from 0·01 to 0·1 g.

Large Intrathecal Daily Doses in Early Cases.—The more advanced the meningitis the greater the reaction to intrathecal streptomycin, and a patient admitted with no irritative symptoms can tolerate relatively larger doses. The rationale of large early intrathecal doses is to combat the bacilli when the symptoms and signs are relatively slight and the meningeal irritation is not well marked, with no evidence of hydrocephalus or paralytic phenomena. As the clinical picture improves, the doses may be decreased gradually until they can be abandoned in favour of intramuscular therapy alone. There is a very definite risk that intrathecal streptomycin will aid the production of hydrocephalus. In early cases this risk must be taken, but the nearer one gets to the hydrocephalic stage the more care is necessary with intrathecal therapy.

RESULTS

Tuberculous Meningitis

Of the 50 patients treated 21 have been discharged cured according to clinical and laboratory findings, 3 are still under treatment and show clinical improvement with significant laboratory findings, and 26 have died (tables I and II).

In most of the 21 cases cured. treatment was begun in the first ten days of disease. Two broad phases can be described: (1) clinical improvement; and (2) recovery confirmed by C.S.F. laboratory findings. During clinical improvement intensive intrathecal and intramuscular treatment was given with the immediate aim of arresting the disease, and relatively large doses were administered. This phase lasted, on an average, four or five weeks, and by that time the clinical picture had become normal and gave a favourable prognosis. The phase of recovery ranged two or three months, during which we still gave both intramuscular and intrathecal streptomycin but in smaller doses, the intramuscular dose being much larger than the intrathecal, which was steadily reduced. During this phase intermittent treatment was continued until the C.S.F. had become almost normal (albumin 0·3 g. per 100 g., and cells fewer than 10 per c.mm.). The periods of "rest" were gradually lengthened. After this, further treatment for a month by the intramuscular route was given and then the patient was discharged. The patient remained under weekly observation and after three months was given ten days' intramuscular therapy, repeated at three-monthly intervals during the first year. Some of these cases have been under treatment and observation for about a year now (table I), and in none of them has any sign of relapse been seen, and they are perfectly well.

The 3 patients in whom the laboratory findings have not confirmed what appears to be a clinical cure (table I) are still under treatment.

Of the 26 patients who died (table II), 3 had received what might be called a full course of treatment—i.e., long enough for a favourable effect to show itself if it was going to appear at all—and 23 died before they had received a full course of treatment. In every one of this group the history suggests that the disease had lasted at least fifteen days before the child was given intrathecal streptomycin. Table II shows that streptomycin clearly prolonged the disease in 7 cases and possibly in more, and its clinical course was changed from that which we have seen so many hundreds of times in pre-streptomycin days.

TABLE II—INEFFECTIVE TREATMENT WITH STREPTOMYCIN

TUBERCULOUS MENINGITIS

Case no.	Age	Date of admission (1947)	Weight (kg.)	Duration of treatment (days)	Dosage (g.) I.M.	Dosage (g.) I.T.	Dosage (g.) Total per kg. body-weight	*Myco. tuberculosis*
Regular treatment:								
30	3 yr.	June 25	12	80	60·4	1·8	5·0	+
31	14 mos.	Sept. 12	8·5	38	31·8	1·65	4·0	÷
Incomplete treatment:								
32	3 yr.	May 31	11	39	28·4	3·7	2·9	..
33	6 ,,	Oct. 3	18	13	22·8	1·3	1·3	÷
34	13½ mos.	Sept. 30	9	15	2·4	0·3	0·3	÷
35	4 yr.	Sept. 16	13	3	3·6	0·35	0·3	÷
36	10 ,,	Sept. 27	27	5	3·2	0·4	0·13	+
37	4 ,,	Aug. 12	12·5	3	2·6	0·3	0·24	..
38	2 ,,	July 22	10·5	9	5·0	0·5	0·55	..
39	22 mos.	Oct. 31	9	28	17·75	0·25	2·0	÷
40	10 yr.	March 24	28	25	1·8	0·2	0·07	÷
41	5 ,,	April 4	14	18	5·9	0·6	0·46	..
42	12 ,,	May 26	33	1	0·8	0·2	0·03	..
43	2½ ,,	June 5	12	6	4·3	0·7	0·4	÷
44	10 ,,	June 13	26	2	1·4	0·1	0·058	÷
45	18 mos.	June 18	9·5	2	1·8	0·2	0·22	..
46	3 yr.	July 23	12·5	2	1·8	0·2	0·16	..
47	10 ,,	July 28	28	7	5·5	0·5	0·22	+
48	4 ,,	Aug. 19	13·5	2	0·4	0·1	0·04	..
49	3 ,,	Sept. 4	12	2	1·45	0·03	0·13	÷
50	21 mos.	Nov. 5	8·5	4	2·56	0·14	0·32	÷
51	14 ,,	Oct. 25	10	2	2·4	0·1	0·25	÷
52	3 yr.	Nov. 15	12	2	0·95	0·05	0·08	÷
53	7 ,,	Nov. 25	20	22	17·9	0·37	0·91	..
54	22 mos.	Nov. 22	10	7	6·0	0·04	0·6	..
55	2 yr.	Nov. 20	10·5	16	6·6	0·4	0·66	..

MILIARY TUBERCULOSIS WITH TUBERCULOUS MENINGITIS

Case no.	Age	Date of admission (1947)	Weight (kg.)	Duration of treatment (days)	Dosage (g.) I.M.	Dosage (g.) I.T.	Dosage (g.) Total per kg. body-weight	*Myco. tuberculosis*
Complete treatment:								
56	11 yr.	May 12	25	123	80·7	4·0	3·4	÷
57	9½ mos.	July 23	5	103	43·8	0·25	8·8	÷
58	15 yr.	Nov. 15	38	40	68·0	2·0	1·8	+
Incomplete treatment:								
59	11 mos.	June 11	7	8	8·0	0·5	1·2	÷
60	12 ,,	Oct. 10	9	15	6·0	0·7	0·7	÷
61	20 ,,	Oct. 13	8·5	4	2·8	0·2	0·36	..
62	6 ,,	Nov. 3	5·5	3	1·0	0·2	0·22	÷
63	5½ yr.	Oct. 2	15	18	4·8	0·5	0·36	+

Note relatively few deaths in those who survived more than a few days.

"Complete" treatment refers to cases which had a substantial amount of streptomycin which in other cases has produced a cure, whereas those given "incomplete" treatment died before a possibly curative dosage could be completed.

Some 14 of these children died within a week of admission to hospital. Among them the signs of hydrocephalus were slight and the rise of tension of the C.S.F. was not well marked. No true opisthotonos developed. In the final stages the temperature and pulse-rate rose suddenly, the temperature rising higher and more quickly than the pulse-rate, so that the pulse line crossed the temperature line on the chart, a phenomenon often noted by Continental workers.

On the other hand, where treatment had been lengthy, death was a direct result of excessive intracerebral tension due to acute hydrocephalus. The evolution of tuberculous meningitis to this stage is undoubtedly due to the prolongation of the disease by streptomycin.

We cannot explain the failure of streptomycin in this group, but delay in starting treatment certainly limits its favourable effects and makes administration more hazardous. For reasons mentioned above, intrathecal streptomycin given at the wrong time, in advanced stages of tuberculous meningitis, may accelerate the end and possibly be the actual cause of death.

A few of the children had been treated before admission with intramuscular streptomycin for three weeks or more. None of these recovered, and we believe that intramuscular streptomycin does nothing towards preventing

Streptomycin modifies the classical picture of tuberculous meningitis in its two stages, inflammatory and hydrocephalic, and by prolonging the patient's life increases the incidence of extreme hydrocephalus with fontanelles and even cranial sutures widely open. It is a weakness of the treatment that streptomycin contributes to this effect both directly and indirectly by lengthening the disease. In our earlier cases our persistence with large intrathecal doses undoubtedly contributed to a fatal issue.

We no longer see deaths in the paralytic state as w did before the introduction of streptomycin, but there ar many more deaths from acute hydrocephalus. The sign which should be carefully watched for in streptomyci treatment are gradually increasing opisthotonos, repeate uncontrollable vomiting, a sudden increase in pulse-rate

TABLE I—EFFECTIVE TREATMENT WITH STREPTOMYCIN

TUBERCULOUS MENINGITIS											
Case no.	Age	Date of admission (1947)	Date of discharge	Weight (kg.)	Dosage (g.)			*Myco. tuberculosis* in C.S.F.	Fundus examination for tubercles	Months from cessation of treatment to March 31, 1948	Remarks
					I.M.	I.T.	Total per kg. body weight				
Cured according to clinical and laboratory findings:											
1	2½ yr.	May 12	Aug. 19, 1947	15	37·6	2·0	2·6	+	+	8	No disturbance of hearing of vestibular function
2	6 ,,	May 29	Nov. 12, ,,	20	50 4	5 7	2·8	+	+	5	Temporary mental confusio now clear
3	13 ,,	April 6	June 26, ,,	35	55·2	4·1	1·6	..	..	9½	No disturbance of hearing of vestibular function
4	2 ,,	June 1	Oct. 16, ,,	13	88·4	5·7	7·2	..	+	6	,,
5	13 ,,	April 4	July 14, ,,	40	66·0	4·0	1·75	..	..	9	,,
6	5 ,,	May 30	Aug. 16, ,,	15	51·2	3·4	3 6	..	+	8	,,
7	6½ ,,	Aug. 15	Nov. 26, ,,	7	29·0	1·45	4·4	+	+	5	,,
8	2½ ,,	April 1	Oct. 6, ,,	11	52·8	3·35	5·0	+	..	6	,,
9	7 ,,	April 3	July 2, ,,	22	66·0	7·7	3·32	..	+	9	,,
10	15 mos.	May 22	Dec. 9, ,,	7·5	55·35	7·0	8·4	+	..	4	Permanent disturbance of 8 nerve
11	14 yr.	Aug. 15	Dec. 4, ,,	31	75 4	3·25	2·5	+	..	4	No disturbance of hearing of vestibular function
12	6 ,,	June 20	Dec. 21, ,,	20	95·0	5·0	5·0	+	..	4	,,
13	8 ,,	May 5	Dec. 11, ,,	23	75·5	7·5	3·6	..	..	4	,,
14	10 ,,	April 6	Dec. 16, ,,	40	113 0	7·0	3·0	+	+	4	,,
15	3½ ,,	July 7	March 9, 1948	12	82·4	3·75	7·0	..	..	4	,,
16	11 ,,	Aug. 3	Jan. 15, ,,	30	68·0	4·2	2·4	+	+	3	,,
17	4 mos.	Aug. 7	Jan. 15, ,,	4	45 0	3·0	12 0	+	..	3	,,
18	11 yr.	July 24	Feb. 24, ,,	31	93·0	7·0	3 2	+	+	2	,,
19	9 ,,	Oct. 4	March 6, ,,	30	55·7	2·3	1·93	+	..	1½	,,
20	9 ,,	Oct. 4	March 9, ,,	27	54·3	3·2	2·1	+	..	1½	,,
21	11 ,,	Nov. 23	March 10, ,,	28	34·2	2·8	1·3	+	..	1¼	,,
Cured clinically but not according to laboratory findings:											
22	14 yr.	Oct. 24	Still in hospital	52	48·7	7·3	1·08	+	..	..	..
23	11½ ,,	Oct. 31	,,	50	47·6	2·4	1·0	+	..	1¼	..
24	20 mos.	Nov. 20	,,	10	19·9	1·5	2·1	+	..	..	..
MILIARY TUBERCULOSIS WITH TUBERCULOUS MENINGITIS											
25	8 yr.	April 11	Oct. 5, 1947	22	51 2	4·5	2·5	* +	+	6	Cured according to clinical an laboratory findings; n relapse
26	2 ,,	April 6	July 5, ,,	12	25·6	1·4	2 25	+	..	9	Cured according to clinical an laboratory findings on di charge, but relapsed March 6, 1948
27	2 ,,	Sept. 15	Still in hospital	8	61·5	1·5	7·87	+	..	..	Clinically improved
28	2½ ,,	July 25	Jan. 10, 1948	11·7	94·4	2·1	8 2	..	..	3	Cured according to clinical and laboratory findings, but relapsed on March 8, 1948
29	11 ,,	July 30	Jan. 25, ,,	24	39·8	0·8	1·75	+	..	3	Cured according to clinical and laboratory findings; no relapse

* Tuberculous spondylitis.

admitted with a positive Mantoux and end fatally the positive reaction persists throughout.

Erythrocyte-sedimentation Rates (*E.S.R.*).—These do not help very much. They are so irregular that one cannot draw conclusions from them. The rate is often high at the start of treatment and low when much improvement has taken place.

Lipase in C.S.F.—We do not know of other investigations into the variations of the lipase content of the C.S.F., and our conclusions are submitted with reserve. We use the Comfort-Osterberg method of evaluation, and we note that the lipase content seems to be lower in advanced stages of tuberculosis during the primary phase of therapy. It becomes even lower but rises again as soon as the patient's condition has definitely improved.

Sugar and Chlorides in C.S.F.—Diminution and irregular variations of the sugar and chlorides are noted initially, but as improvement takes place their quantities increase and tend to remain within normal limits.

SECONDARY EFFECTS AND TOXICITY

We are satisfied that vertigo, headache, and vomiting [illegible] due to streptomycin, but these symptoms do not persist. We believe also that the ocular phenomena which have been described are mainly due to the tuberculosis and tend to disappear under streptomycin therapy. We wish to draw special attention to alterations in the fundus. Of the 21 patients discharged as cured a baby aged 6 months presented with a partial atrophy of the papilla, which was cured after four months' treatment. A second showed atrophy of the papilla and cerebellar disturbances. Both of these cases were given relatively large doses of streptomycin. Another case developed [illegible] well-marked hypertrichosis on the front of the leg which later regressed. One patient showed mental confusion and logorrhœa which, though diminishing, [illegible] persist. Another presented the same symptoms which cleared quickly. In 2 patients paresis of the left [illegible] was seen, and both are improving. One case only [illegible] permanent disturbance of the eighth nerve. We [illegible] not observed any toxic effects other than these.

AUXILIARY THERAPY

We have used tuberculin in all our cases, except [illegible] which proved fatal soon after admission. We thought to reinforce the effects of streptomycin, having [illegible] led to the conclusion that streptomycin modifies [illegible] tuberculin reaction and, we think, intensifies it. We feel too that, under streptomycin, the margin between [illegible] toxic and therapeutic doses of tuberculin becomes [illegible]er. We do not know whether the very small doses [illegible] streptomycin we use have anything to do with this, and we do no more than report the fact. We have, however, divided a later series of cases and are treating [illegible] of them with streptomycin and tuberculin and half without tuberculin.

We have in certain cases, where the general condition was very poor, given blood-transfusions with temporary relief and a gain of time, and we have also given each patient concentrated vitamins A and D.

SUMMARY

Streptomycin therapy was given to 63 children with tuberculous meningitis, 13 of whom also had miliary tuberculosis.

Cures, according to both clinical and laboratory findings, can be obtained with combined intramuscular and intrathecal injections of streptomycin, recovery being accompanied by a high degree of allergy.

Early treatment with streptomycin is of prime importance—the earlier the treatment the more favourable the prognosis. By "early" is meant within the first ten days from the onset. This does not mean that the apparently hopelessly ill patient cannot be cured; nor that every early case can be cured.

In cases which do not respond to streptomycin a streptomycin-resistant strain of *Myco. tuberculosis* is probably present, but we have no laboratory confirmation of this.

Undesirable effects seem to be more the result of the disease in advanced stages than of the streptomycin in the doses we have come to use.

Dosage depends on the time when treatment is begun in relation to the stage of the disease, and to a less extent on the patient's age. Very young children usually need and tolerate streptomycin in larger doses per unit of body-weight than do older ones. Our dosage is the smallest so far recorded. Tuberculous meningitis combined with miliary tuberculosis needs larger doses and longer treatment than meningitis alone.

Our best results have been with intermittent treatment with intervals of rest.

We believe that paratracheal adenitis in primary tuberculosis is too often a forerunner of tuberculous meningitis for this to be regarded as coincidental, and we consider that streptomycin should be used in the treatment of severe cases of primary tuberculosis in children. Of 18 such patients 12 subsequently developed tuberculous meningitis.

We are unable to give an opinion on the danger of creating streptomycin-resistant strains of *Myco. tuberculosis*.

Intrathecal streptomycin is essential in tuberculous meningitis. The intrathecal dosage should be kept to the effective minimum. The effect of the drug must be watched all the time, and wrong dosage will add an unfavourable element to the progress of the disease.

We express our deep gratitude to Dr. J. M. Vine, chief of the Greece Mission of the World Health Organisation, for help in translating our observations into English and for his collaboration in the discussion of our work.

RECURRENT DISLOCATION OF THE SHOULDER

THE SURGICAL TREATMENT

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THE anatomical and physiological causes of recurrent dislocation of the shoulder may be summarised as a deficiency in the anterior part of the capsule, due to either stretching or rupture, with a weakness of the spinati muscles, allowing the intact subscapularis muscle to pull the head of the humerus forwards out of a normally shallow glenoid cavity. The importance of the bone lesions appears to be secondary in that they are probably the result rather than the cause of the dislocation. If, however, there is any congenital deficiency in front of the glenoid cavity or behind the humerus, this will strongly predispose the shoulder-joint to recurrent dislocations.

Based on these structural and functional changes, the rational treatment to prevent further dislocation is to repair the capsule, restore the muscular balance, and increase the area of the articular surfaces. In any operation, however, the possibility of producing adhesions must be considered. These adhesions can be either extra-articular or intra-articular. The extra-articular adhesions will be situated in the operation wound; since the approach is usually anterior, the adhesions will be mainly in front of the joint. Intra-articular adhesions are much more important. In any procedure in which the shoulder-joint is opened a hæmarthrosis is likely, since no tourniquet can be applied above the site of the operation, and it is impossible to apply any firm bandage to control the reactionary hæmorrhage.

TABLE III—EFFECTS OF INTRATHECAL INJECTIONS OF STREPTOMYCIN IN HEALTHY CHILDREN

Child	Age (yr.)	Daily intrathecal dose (g.)	Cerebrospinal fluid						Remarks
			Albumin (g. per 100 ml.)		Cells (per c.mm.)		Sugar (Benedict) (mg. per 100 ml.)	Chlorides (g. per 100 ml.), as sodium chloride	
			Before injection	24 hr. after injection	Before injection	24 hr. after injection			
A	4	0·15	0·02	0 15	2–3 lymphs	1800 polys	..	..	Rise of temperature from 98·4 to 103°F a injection; convulsions and vomiti Only one injection given
B	3½	0·05	0·025	0·04	2–4 lymphs	340 polys	40–50	0 7–1·0	These injections were continued for six d After two more days lumbar C.S.F. c tained albumin 0·035 g. per 100 while cisterna fluid contained albu 0·025 g. per 100 ml., and lumbar cell-co was 170 per c.mm. against cisternal co of 65 per c.mm. There was no change either sugar or chlorides
C	3	0·05	0·02	0·03	3–4 lymphs	222 polys	40–50	0·7	Treatment given for six days and stopped. Two days later lumbar C. contained albumin 0·03 g. per 100 while cisternal fluid contained albu 0·02 g. per 100 ml. and lumbar cell-cou was 108 per c.mm., while cisternal co was 30 per c.mm. with 75% polymorp In this case, before treatment, b lumbar and cisterna punctures were d and showed the same amount of albu and cells in each. There was no change either sugar or chlorides in this case

hydrocephalus and the increased tension, and that when we started intrathecal treatment we probably did more harm than good.

Death took place more often among the very young than among older children. The average age of the 21 patients who recovered was 6 years 11 months, whereas that of the 26 who died was 4 years 8 months. The difficulty of early diagnosis in infants, plus the association of the meningitis with primary tuberculosis in so many cases, contributes to this. Moreover, the antigenic resistance in infants is lower than in older children. We also found miliary tuberculosis more often in the very young, and some of our patients had tuberculous bronchopneumonia.

Miliary Tuberculosis with Tuberculous Meningitis

Of 13 cases in this group (tables I and II), 2 seem to have been cured, according to clinical, radiological, and laboratory standards, some twelve months after admission; 2 were discharged with clear clinical, radiological, and laboratory findings, but have relapsed with meningitis twelve months after admission and six months after the end of treatment in the one case, and eight and a half months after admission and three months after the end of treatment in the other. One child has improved —i.e., the clinical condition is good but the laboratory findings are abnormal—and is still under treatment after six months; and the other 8 children died—3 after lengthy treatment, and 5 before a full course of streptomycin could be completed.

The relatively small number of patients with miliary tuberculosis who are either admitted with tuberculous meningitis or develop it later (in this series 13 out of 66, and in an earlier pre-streptomycin series about 10 in 100) makes us wonder what, if any, is the connexion between the two conditions. The treatment of miliary tuberculosis with streptomycin has not prevented tuberculous meningitis arising as a complication under a somewhat disguised clinical aspect. (We have never known miliary tuberculosis to follow tuberculous meningitis.) Since December, 1947, however, 8 cases of miliary tuberculosis treated with streptomycin have not shown any meningitis. We have seen so many cases of primary tuberculosis in children up to 2 years of age, with enlargement of the paratracheal glands (as opposed to the hilar group), go on directly to tuberculous meningitis that we feel that this is more than a chance happening. Of children with tuberculous paratracheal adenitis in pr streptomycin days 12 died of tuberculous meningit within six months of the first diagnosis of glandul tuberculosis.

The development of meningitis cannot be exclud even when a case of miliary tuberculosis seems to be doi well under streptomycin. In miliary cases that devel meningitis the method of administration is the same for uncomplicated tuberculous meningitis. The cou of the disease is longer, and prognosis is difficult, with t age of the patient as an important factor. Milia tuberculosis with tuberculous meningitis in infants the most severe and intractable form of tuberculos which we have submitted to streptomycin therapy. W perform regular spinal puncture in all cases of miliar tuberculosis in an effort to obtain early information abo asymptomatic or camouflaged meningitis. The progno when a patient is admitted with both forms is ba but it seems to be better when a patient with milia tuberculosis develops meningitis after some treatme with streptomycin.

INFLUENCE OF STREPTOMYCIN THERAPY ON MANTOU REACTION, E.S.R., AND C.S.F. FINDINGS

Mantoux Reaction.—We use Koch O.T. 1/10,000 o the flexor aspect of the wrist or on the inner thigh. W read the result after twenty-four hours, and measure t reaction by the method of Groer. The test is repeate every fifteen days during treatment. In cases admitte in an advanced stage the Mantoux is negative. Bu as treatment goes on and improvement begins the reactio becomes positive and more strongly so as improvemen continues. In cases not so severe on admission we fin the reaction strongly positive during the initial phases o treatment, decreasing and remaining at a lower leve and finally rising again as the tuberculosis definitel regresses. The reaction has remained strongly positiv in all children who have been discharged and report bac for control. When charted according to the Groer scheme the reaction shows three stages: (1) the acute, with high curve to the end of the period of clinical improve ment; (2) the sustained, with a lower curve whic continues until the following stage; and (3) the con valescent, or perhaps recovered, stage where the curv again becomes high. In advanced cases which ar low-up a year or two later a full range of movement was found in 14 shoulders, a limited range in 1 (patient was not traced), and in 12 shoulders there been no recurrence of dislocation.

SUMMARY

Recurrent dislocations of the shoulder-joint are due a combination of structural and functional circum- which should be considered in the planning of operation.

Restoration of the normal synergistic action of the muscles by partial tenotomy of the subscapularis muscle, bined with an artificial increase of the articular area the glenoid cavity, should give the highest percentage cures with the normal range of movement.

An operation of this kind is described, and the results 14 cases are tabulated.

wish to thank Prof. T. P. McMurray who showed me, was using, a similar principle in operating, and the ical Director-General of the Royal Navy for permission ublish these cases.

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EFFECT OF CARONAMIDE ON BLOOD-PENICILLIN CONCENTRATIONS IN MAN

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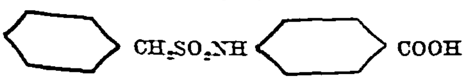
rapid excretion of penicillin by the kidneys has it difficult to maintain constant therapeutic -penicillin levels. Attempts to do so have been in different ways—e.g., by giving frequent intralar injections, by using oily media to delay the ption of penicillin (Romansky and Rittman 1944), by trying to delay the excretion of penicillin by the tubules.

me 80% of the penicillin which appears in the urine been excreted by the tubules (Rake and Richardson), and its excretion by this route can be delayed by done (Rammelkamp and Bradley 1943), *p*-aminopuric acid (Beyer et al. 1947), or sodium benzoate aulding et al. 1947). Beyer (1947) suggests that these ances functionally saturate the renal tubules and inhibit the elimination of penicillin. Their application to therapeutics is limited, however, because they are eted as rapidly as penicillin, and hence it is only sible to maintain adequate concentrations by their tinuous intravenous administration.

Beyer (1947) has reported that the tubular excretion penicillin can be reversibly inhibited by the administion of a compound synthesised by Sprague et al. Beyer et al. 1947) and marketed in this country r the trade name of 'Caronamide':



Caronamide
(4'carboxyphenylmethanesulphonanilide)

t was claimed that, though this compound could block tubular excretory mechanism for penicillin, it was minated from the body by slow glomerular filtration. t was absorbed from the alimentary tract and could be given by mouth in sufficient quantities to produce its effect on the tubules. In animals its administration led to no detectable tubular damage and to no significant alteration in the blood chemistry or in the glomerular filtration of urea or of sulphonamides. When the administration of caronamide was stopped, there was a rapid return of tubular function to normal, even after caronamide had been administered for several weeks. Tubular reabsorptive mechanisms, such as those for glucose, were unaffected during its administration.

Beyer's conception of the mode of action of caronamide was that it inhibited some enzymatic component of tubular excretion and thereby blocked the particular system involved in the excretion of penicillin. The inhibition by ephedrine of tyramine deamination by amine oxidase is cited as a parallel in-vitro inhibition.

Crosson et al. (1947) studied the effects of the administration of caronamide to persons receiving penicillin by intramuscular injection and by mouth. They found that the blood-penicillin levels were raised to 2–7 times greater than during the control periods. Seeler et al. (1947) found that when caronamide was administered in doses of 2 g. four-hourly to patients over 60 years of age there was a pronounced increase in the plasma-penicillin levels. It appeared necessary to give 4 g. four-hourly to younger persons to produce the same effect; but, when this dose was given, the blood-penicillin levels produced by the injection of 100,000 units of penicillin were higher than those produced by the injection of 300,000 units without caronamide. Boger et al. (1947) confirmed the action of caronamide on penicillin excretion in man. With caronamide they maintained plasma-penicillin levels of 30–60 units per ml. They found, however, that the effect of the same dose was not always constant in the one patient at different times.

Dosage.—Enough caronamide has to be given daily to inhibit tubular function adequately. Methods devised for the estimation of plasma-caronamide are not practical for routine use, but from experimental studies it seems necessary to attain plasma-caronamide levels of 20–30 mg. per 100 ml. (Boger et al. 1947). Probably the effective dose varies somewhat from patient to patient according to the individual renal function, but in most cases 20–24 g. in twenty-four hours will produce the required blood-caronamide level and leads to significant tubular inhibition. In children it may be necessary to use the adult dose to produce the required effect.

Phenolsulphonephthalein Test.—Phenolsulphonephthalein is excreted by the same tubular mechanism as penicillin, and the administration of caronamide leads to a considerable decrease in the excretion of the dye during the first hour following its intravenous administration. It has been claimed that, if sufficient caronamide is given to inhibit tubular excretion of the dye, the excretion of penicillin is also inhibited (Boger et al. 1947).

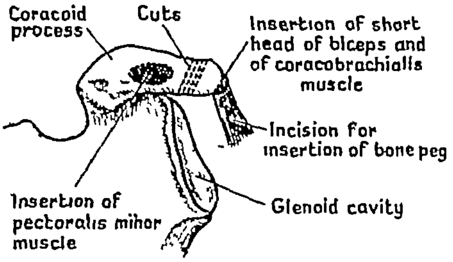
CLINICAL STUDY

Our experiment was designed to determine the effect of caronamide on the blood-penicillin levels which can be achieved by repeated three-hourly or four-hourly injections, by a single injection, and by penicillin given by mouth.

Except where otherwise indicated all the patients were men, aged 20–52, convalescent from acute infections or conditions such as sciatica, and in none of them was there any evidence of renal impairment. They all received a standard hospital diet with no restrictions regarding salt or fluid intake. Penicillin was given intramuscularly as the sodium salt dissolved in normal saline solution at a concentration of 50,000 units per ml., and by mouth as the calcium salt. All the patients were given caronamide 3 g. three-hourly, one dose being omitted during the night, so that a total of 21 g. was

It is a clinical observation that those shoulders which are rather stiff after operation are unlikely to suffer further dislocation. It seems probable that both the stiffness and the stability of the head of the humerus are due to the adhesions.

BANKART'S OPERATION


Coracoid process
Cuts
Insertion of short head of biceps and of coracobrachialis muscle
Incision for insertion of bone peg
Insertion of pectoralis mihor muscle
Glenoid cavity

The operation most used at present is the one usually attributed to Blundell Bankart (1938), which is similar in many respects to that of Oudard (1924). The joint is approached through a straight incision in the deltopectoral groove; the coracoid process and the subscapularis muscle are then divided, and an attempt is made to repair the capsule., The practical difficulties in this step are considerable, The lesion is situated deep down in a narrow wound which easily fills with blood. The difficulties in drilling the necessary holes in the glenoid cavity and in inserting the sutures are great. Even if the torn structures are reapposed, there is considerable doubt whether they will be permanently united by the formation of fibrous tissue.

In the repair of the wound the subscapularis muscle is sutured. Muscle has a good blood-supply and unites well, provided it is kept in apposition; but, being deficient in fibrous tissue, it holds sutures poorly. During the spasms which occur when the patient is coming round from the anæsthetic the muscle must contract, throwing tension on these sutures. The sutures may tear and weaken, allowing the muscle to retract and a small gap to appear between the cut ends. The muscle is thus elongated and weakened. Thus inadvertently this operation, by reducing the power of the subscapularis muscle, may restore the normal balance between this muscle and its opponents.

The next stage in the repair of the wound is the suture of the coracoid process. The coracobrachialis muscle and the short head of the biceps muscle are attached to the distal fragment. These, by their contraction, will tend to pull this fragment downwards; again it seems likely that a gap is formed between the two fragments which subsequently becomes filled with callus and bone. The coracoid process is thus elongated and may act as a buttress in front of the head of the humerus, thus fortuitously increasing the "functional" articular area.

PRESENT OPERATION

This is based on the assumption that recurrent dislocation of the head of the humerus after Bankart' operation might in part be prevented by the elongation of the coracoid process as just described. It was hoped that a coracoid process somewhat resembling that foun in patients with Erb's palsy could be created. If suc a buttress could be built up it would adequately preven further dislocation of the head of the humerus.

The coracoid process is approached through a straig incision. The deltoid and pectoral muscles are retracte The part of the coracoid process distal to the insertio of the pectoralis minor muscle is divided by four obliq cuts with an osteotome (see figure), care being taken not strip from the resulting pieces of bone the fibrous tiss carrying their blood-supply. The pieces of bone are the levered apart, the most distal fragment being displac downwards and outwards. As many chip grafts possible are forced between the pieces of coracoid proce No attempt is made to dissect the process clear, for is from the attached soft tissues that the bone deriv its blood-supply. The coracobrachialis muscle and th short head of the biceps muscle, at their insertions in the tip of the coracoid process, form a rounded musc almost surrounded by an envelope of fibrous tiss A vertical incision is made in this fibrous tissue (s figure) to enable a peg graft to be driven upwards in the tip of the coracoid process. The envelope of fibro tissue is next sutured to hold the bone peg in the muscl The wound is closed in layers. The patient's arm kept by his side in a sling for some six weeks to all the bone to consolidate.

RESULTS

The cases recorded in the accompanying table w all in Servicemen aged 20–40 years. In none of the was there any history of epileptic fits. The series inc all the cases admitted to hospital during this period.

On 15 patients 16 operations were performed (1 pati was subject to recurrent dislocation of both shoulder

RESULTS OF OPERATION

Date of last report	Side and no. of dislocations	Date of operation	Occupation	Recreation	Range of movement	Recurrenc
1947	Left 11	Oct. 19, 1945	Manager, ice rink	Skating	Full	None
	Left 30–40	Nov. 19, 1945	Painter	Football and swimming	Full	None
	t 32	Nov. 26, 1945	Hotel manager	Squash	Full	None
	3	Dec. 17, 1945	Joiner	Football	Full	None
		Dec. 26, 1945	Farmer	None	Full	3
		Jan. 14, 1946	Bus conductor	Gardening	Full	None
		Dec. 4, 1945	Agricultural worker	Hockey	Full	None
		Feb. 20, 1946	Painter	Cricket	Full	None
		rch 18, 1946	Bricklayer	Games and swimming	Full	None
		19, 1945	Engine fitter	None	Full	None
		1946	Builder	Games	Full	None
		945	Light work	None	Limited	3
		6	Sailor	Games	Full	1
			Builder's labourer	Football	Full Full	None None
			..	..	..	Untraced

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the months of treatment —i.e., the clinic findings are abnorm after six months; and after lengthy treatment, an streptomycin could be comple

The relatively small number o tuberculosis who are either admitt meningitis or develop it later (in this and in an earlier pre-streptomycin series makes us wonder what, if any, is the con the two conditions. The treatment of culosis with streptomycin has not prevented meningitis arising as a complication under a disguised clinical aspect. (We have never know tuberculosis to follow tuberculous meningitis.) December, 1947, however, 8 cases of miliary tube treated with streptomycin have not shown any gitis. We have seen so many cases of primary t culosis in children up to 2 years of age, with enlargen of the paratracheal glands (as opposed to the h group), go on directly to tuberculous meningitis that w

PLASMA-PENICILLIN LEVELS AFTER ADMINISTRATION OF PENICILLIN WITH AND WITHOUT CARONAMIDE

Age (yr.)	Dose of penicillin (units)	Reduction in PSP excretion	Caronamide*	Plasma-penicillin levels (units per ml.)											
				Hours after dose of penicillin											
				0	1/4	1	2	3	4	5	6	7	8	9	10
ular Penicillin (Single Dose):															
49	30,000		—	..	0·5	0·25	0·03	0	..	..	..	..	..	..	..
		54 %	C	..	1·0	0·18	0·06	0	..	..	..	..	..	..	..
21	30,000		—	..	1·0	0·5	0·03	0	..	..	..	..	..	..	..
		15 %	C	..	0·5	0·5	0·06	0·09	0·015	0	..	..	..	..	..
39	30,000		—		Not	done									
		62 %	C	..	..	..	0·125	0·09	0·06	0·06	0·03	0·015	0	..	..
26	30,000	Not done	—	..	0·5	0·25	0·06	0·03	0	..	..	..	..	..	..
			C	..	1·0	0·5	0·25	0·125	0·09	0·06	0·015	0·015	0	..	..
50	50,000		—	..	0·5	0·25	0·06	0·03	0	..	..	..	..	..	..
		46 %	C	..	0·75	0·5	0·5	0·125	0·06	0·06	..	..	..	..	..
39	50,000	Not done	—		Not	done									
			C	..	..	..	..	..	..	0·125	0·125	0·06	0·045	0·03	..
29	100,000		—	..	2·0	0·5	0·25	0·03	0·03	0	..	..	..	..	..
		Nil	C	..	3·0	1·0	0·3	0·2	0·09	0·06	0·045	0·015	0	..	..
26	100,000		—	..	1·5	1·5	0·75	0·25	0·06	..	..	..	..	..	..
		90 %	C	..	4·0	1·0	1·0	0·5	0·25	..	..	..	..	..	..
		..	C	..	..	..	..	..	..	0·37	0·25	0·125	0·06	0·03	0·015
46	100,000		—	..	1·0	0·5	0·25	0·125	0·03	0	..	..	..	..	..
		68 %	C	..	4·0	2·0	1·5	1·0	0·25	..	..	..	..	..	..
		..	C	..	..	..	..	..	..	0·18	0·125	0·06	0·03	0·015	0
25	100,000		—	..	2·0	0·5	0·06	0·03	0	..	..	..	..	..	..
		Nil	C	..	1·0	0·5	0·25	0·09	0·03	..	..	..	..	..	..
		..	C	..	..	..	..	..	..	0·03	0	0	0	..	..
49	200,000		—	..	8·0	1·0	0·5	0·125	0·06	0·03	0·015	0	..	..	..
		66 %	C	..	22·0	2·5	1·0	0·25	0·25	0·25	0·1	0·1	..	..	..
Penicillin (Single Dose):															
35	50,000		—	..	..	0·25	0·06	0·03	0	..	..	..	..	..	..
		90 %	C	..	..	1·0	0·25	0·125	0·125	0·06	0·03	0	..	..	..
25	50,000		—	..	..	0·03	0	..	..	..	..	..	..	..	..
		65 %	C	..	..	0·125	0·015	0	..	..	..	..	..	..	..
27	50,000		—	..	..	0	0	0	..	..	..	..	..	..	..
		63 %	C	..	..	0·125	0·06	0·03	0	..	..	..	..	..	..
45	50,000		—	..	..	0·03	0·015	0	..	..	..	..	..	..	..
		29 %	C	..	..	0·06	0·03	0	0	..	..	..	..	..	..
		77 %	C	..	..	..	..	..	..	0·045	0·03	0	..	..	..
52	100,000		—	..	..	0·25	0·06	0·06	..	..	..	..	..	..	..
		70 %	C	..	..	0	0·03	0·03	0·03	0·015	0	..	..	..	..
35	100,000		—	..	..	0·03	0	..	..	..	..	..	..	..	..
		65 %	C	..	..	0·18	0·125	0·06	0·03	..	..	..	..	..	..
		..	C	..	..	..	..	..	..	0·125	0·06	0·045	..	..	..
45	200,000		—	..	..	0·18	0·2	0·125	0·03	0	..	..	..	..	..
		Nil	C	..	..	0·5	0·25	0·125	0·045	..	..	..	..	..	..
		..	C	..	..	..	..	..	..	0·06	0·03	0·03	0·015	0	..
43	200,000		—	..	..	0·125	0·03	0·03	0·015	0	..	..	..	..	..
		38 %	C	..	..	0·03	0·03	0·03	0·015	..	..	..	..	..	..
		38 %	C	...	..	0·25	0·125	0·06	0·03	0·02	0·015	0	..	..	..
35	200,000	Not done	—	..	..	0·03	0·015	0	..	..	..	..	..	..	..
			C			0·5	0·25	0·25	0·06	..	..	..	..	..	..
muscular Penicillin (Repeated Doses):															
25	100,000 3-hourly	Not done	—	0·03	..	0·5	0·135	0·03	..	..	..	..	..	..	..
			C	1·0	..	4·0	2·0	2·0	..	..	..	..	..	..	..
30	,,	,, ,,	—	0·06	..	1·0	0·25	0·06	..	..	..	..	..	..	..
			C	0·5	..	3·0	1·0	1·0	..	..	..	..	..	..	..
34	,,	,, ,,	—	0·06	..	1·0	0·25	0·06	..	..	..	..	..	..	..
			C	0·5	..	3·0	1·0	0·5	..	..	..	..	..	..	..
40	,,	,, ,,	—	0·06	..	1·0	0·25	0·06	..	..	..	..	..	..	..
			C	0·25	..	2·0	1·0	0·25	..	..	..	..	..	..	..
37	,,	,, ,,	—	0·03	..	0·5	0·125	0·03	..	..	..	..	..	..	..
			C	0·5	..	2·0	1·0	0·5	..	..	..	..	..	..	..
16	200,000 4-hourly	,, ,,	—	0·125	8·0	2·5	1·0	0·5	0·125	..	..	..	..	..	..
			C_4	1·5	16·0	8·0	6·0	3·0	1·5	..	..	..	..	..	..

* C, caronamide 3 g. three-hourly. C_4, caronamide 4 g. four-hourly.

taken in the twenty-four hours; the drug was dispensed in 0·5 g. tablets. *In all cases, except where otherwise* indicated, this dose of caronamide was given for twenty-four hours before its effect on blood-penicillin levels was determined. Phenolsulphonephthalein-excretion tests, blood-urea-nitrogen estimations, and urine examinations were carried out before and during caronamide administration.

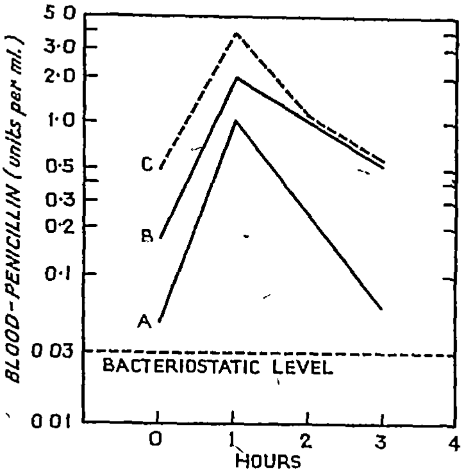

Fig. 1—Effect of caronamide on blood-penicillin levels when intramuscular penicillin 100,000 units is given three-hourly (logarithmic curves): A, before caronamide was given; B, after 24 hours' administration of caronamide; C, after 48 hours' administration of caronamide. Note increased effect on third day.

RESULTS

Repeated Intramuscular Injections of Penicillin.—The effect of caronamide in raising the blood-penicillin levels was determined in 6 cases in which repeated injections of penicillin were given three-hourly or four-hourly. The plasma-penicillin levels were estimated by the method described by Mackie and McCartney (1948). Of the 6 patients 5 had syphilis and 1 bacterial endocarditis. Fig. 1 shows a typical example. It will be noted that curve C obtained after forty-eight hours' caronamide therapy, is significantly higher than curve B, which was recorded on the second day. The detailed results in the other cases are given in the accompanying table. Fig. 2 shows the effect of caronamide administration on the four-hourly injections of 200,000 units of penicillin. The blood-penicillin levels achieved with a single injection of 500,000 units of penicillin are interpolated (curve C), and it is evident that the levels achieved with 200,000 units of penicillin with caronamide are greater than those produced by the single injection of 500,000 units without caronamide.

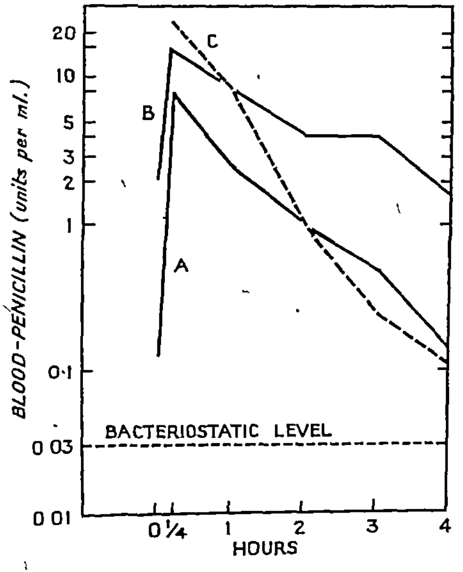

Fig. 2—Effect of caronamide on blood-penicillin levels: A, blood-penicillin levels when intramuscular penicillin G 200,000 units is given four-hourly without caronamide; B, readings from the same case after caronamide had been given for 24 hours; C, blood-penicillin levels achieved with a single intramuscular injection of 500,000 units of penicillin.

Single Intramuscular Injections of Penicillin.—In 10 cases caronamide was given to determine its eff *on the duration of blood-penicillin levels following a* sing injection of penicillin. The phenolsulphonephthalein te was carried out on the first day of the experiment, ar thereafter the blood-penicillin levels achieved by a sing injection of penicillin were recorded (see table). Fro the second day caronamide 3 g. was given three-hour until the end of the experiment. After twenty-fo hours' administration of caronamide the dye test w repeated, *and* the blood-penicillin levels following th same dose of penicillin were again determined. Wh penicillin was demonstrable in the blood for more th six hours, the administration of caronamide was co tinued, and a further *injection of penicillin* was giv *next day.* On this day the blood-penicillin levels we estimated 6–10 hours after the injection (see tabl In 3 cases repetition of the phenolsulphonephthal test twenty-four hours after the caronamide was stopp showed that tubular function had returned to norm. Fig. 3 shows a composite curve made from the avera results *obtained from* 4 patients *receiving intramuscul* penicillin 100,000 units. It will be noted that t greatest effect is on the duration of the blood-penicill levels, which are maintained for twice as long wh caronamide *is* given. In 2 cases the blood-penicil levels were not significantly raised. A similar findi has been reported by American workers (Seeler et 1947).

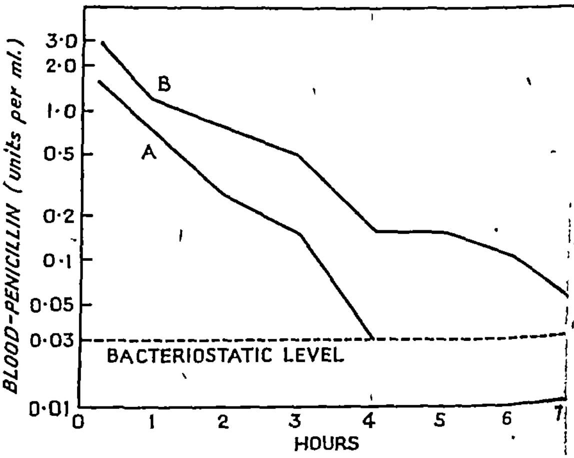

Fig. 3—Average readings from 4 patients given intramuscular penici 100,000 units: A, without caronamide; B, after caronamide had be given for 24 hours.

Penicillin by Mouth.—Recent experimental clinic studies have shown *that not more than* 35% of penicill given by mouth appears in the urine (McDermott et 1946). It has also been shown that there is comparative little destruction by gastric juice unless the pH is under (Stewart and May 1947). Penicillin is probably absorb in the upper part of the small bowel, being rapid destroyed farther down the alimentary tract *penicillinase-producing organisms.*

In our studies we did not try to neutralise the gastr acidity. All the patients had breakfast at 8 A.M., an calcium-penicillin powder, *measured by weight,* was give in a rice-paper cachet at 10 A.M. The other condition of the experiment were essentially the same as thos already described. Blood-penicillin levels following single dose of penicillin by mouth were estimated on th first day and *again after* twenty-four hours admini stration of caronamide. Phenolsulphonephthalein test were also carried *out* as described in the other exper ments. The results are shown in the table. Fig. gives a composite curve of the results obtained from 4 patients *given calcium penicillin* 50,000 units by mouth. When penicillin was given without caronamide after their discharge from the hospital nursery were then admitted to the children's hospital.

Clinical Features.—These were usually refusal of food, ing (often intractable), and diarrhœa, sometimes yellow stools. Later came collapse, signs of dehydra- increasing weakness, drowsiness, rapid loss of weight, occasionally pyrexia, seldom rising higher than F.

Course.—Usually the babies either died of toxæmia two or three days at the latest or recovered after sive treatment. In fatal cases there were increasing ess, collapse, and failure of the circulation, often n by severe meteorism. During the illness the ght of the babies often fell to 30% or even 40% w their birth-weight.

Age.—The age of the babies admitted to this clinic 3–27 days, but most of the babies were aged 6–18 s when the first symptoms were observed. Newborn nts alone were affected, as other writers have pointed . There was no difference in incidence among breast- partially breast-fed, or bottle-fed babies.

Treatment in this clinic consisted in combating toxæmia: vation, followed by special diet and supplemented blood-transfusions. During the period of starvation ot broth was given in preference to weak tea, because believe carrot broth purges the intestine and absorbs ns, besides providing a small amount of nourishment. period of starvation lasted usually two or three days, times longer, until a stage of detoxication was hed. Then we started giving buttermilk with 2% flour, at first without and then with 5% of a special r. Eventually a small quantity of breast-milk, ly skimmed, was given. As an adjuvant, especially the period of starvation, we gave infusions of blood, preferably plasma, eventually changing to 'Periston.' saline plus the glucose either as a supplement ternatively (20–40 ml. according to weight, some- twice a day). The average treatment in this hospital about three weeks; elsewhere it had apparently continued longer.

gnosis generally depends on the virulence of the organism. This virulence may vary so much in ent epidemics that, in assessing the value of any ment, one must compare the results in epidemics ual severity. A factor, which we had no opportunity termining exactly, but which is also pointed out Field et al. (1943), is that during the epidemic the -mortality rises, until it may reach 100%; this is se the virulence of the organism is increased by age. The case-mortality in different epidemics s from 12 to 80%, and it is usually not less than when large numbers of infants are involved (Rice al. 1937, Cooper 1937, Smellie 1939). In the three emics observed by me the rate was 22%: and, if results from two other children's hospitals in wick are included, it was 40%.

Ætiology.—Published opinions on the ætiology of the se are not unanimous. Thus, Rice et al. (1937), enberg and Wronker (1938), Forbes and Olsen (1939), ddy et al. (1939), Cron et al. (1940), Lembcke (1941), d I found that all bacteriological examinations, the ch for a virus, the examination of food and stools, d the necropsy findings were completely without result. epidemic Hotz (1932) ascribed to a *Staph. aureus* oduced by a nurse with an incompletely healed uncle. Felsen (1939) accuses the Flexner bacillus: an et al. (1940) the hæmolytic streptococcus; (1937), Frick (1941), and Lyon and Folsom 1941), Pfeiffer's bacillus; Goebell (1943) *Proteus vulgaris* d *Ps. pyocyanea*; Cass (1941) *Bact. aerogenes*. In one epidemic observed by me *S. enteritidis* Gaertner was covered; but in the other two epidemics we could not isolate any likely organism.

The high infectivity, the epidemicity, and the rapid spread of the disease suggest a virus of high pathogenicity perhaps closely allied to the influenza viruses. The organisms described by other writers should in my opinion be regarded as secondary invaders, or as symbionts with the true organism not yet discovered.

Young pigs are attacked by a sort of influenza starting with cough and bronchitis, soon leading to severe diarrhœa, and generally progressing so quickly and lethally that often 100% die. Farmers know that the infection is transmitted by droplets and that once sties are infected they are dangerous to new litters for long afterwards. They therefore use such sties for other animals before putting in young pigs again. This disease seems to resemble the gastro-enteritis of infants in some respects. Professor Wagener, of the Hygiene Institute, Veterinary High School, Hanover, informed me that the cause might in the first place be the conditions in the communal sties. Later Waldmann and Köbe (Riems) isolated a pneumotropic virus of the influenza group. Other bacilli found, such as *Bacillus bipolaris* and pasteurellas, would be regarded as only incidental. By improving conditions, and especially by avoiding communal sties, it is possible to get rid of the disease completely. Furthermore H. Hormann, in a paper on the ætiology of necrotic jejunitis shortly to be issued by the Bernhard Nocht Institute, refers to results obtained by Köbe in infectious gastro-enteritis in pigs, among which there have been severe epidemics, especially in young pigs. Thus there is in both cases an analogous condition in the rearing of animal sucklings.

The Japanese disease called "ekiri," seems to be a similar condition. This is an epidemic diarrhœa, especially attacking infants, and resulting in a case-mortality up to 80%. The clinical features include a very acute onset, high fever, collapse, cyanosis, and paralysis of limbs, followed by convulsions and unconsciousness, and eventually death. The causative organisms are believed to be of the *Bact. coli* or pseudo-dysentery groups. Adult contacts of babies suffering from ekiri often fall ill with a sort of dysentery.

PREVENTION

Combating an epidemic after it has broken out appears to be hopeless, and the unanimous opinion is that the infected hospital should be completely closed for a time. Prevention is therefore extremely important.

Field et al. (1943) recommended the accommodation of as few patients as possible in each ward: wider spacing of beds; face masks and surgical gowns for nurses; and immediate isolation of new cases of gastro-enteritis. In their view all children under 2 years of age admitted to hospital with dyspepsia should be nursed in isolation cubicles; if an epidemic of severe diarrhœa should break out, new admissions of infants should be stopped temporarily, as many infants as possible sent home, and the remainder widely distributed among older children and adults; and that homes for infants ought to be considered only as emergency war institutions. What a difference from the older view that neonatal wards should always be large!

Rice et al. (1937) emphasised the importance of aseptic nursing of all infants, including the sterilisation of all linen and food and a thorough disinfection of hands. Some writers have recommended that different nurses should be employed for feeding and for cleaning the babies, to prevent the transfer of organisms from the baby's anus to its mouth. Felsen (1939) even recommended the employment of a special epidemiologist. All these suggestions show that the prevention and combating of an epidemic are a grave problem, and that the pathogenicity of the germ must be extraordinarily high. In view of these circumstances, all authors emphasise the fact that temporary closure of the infected

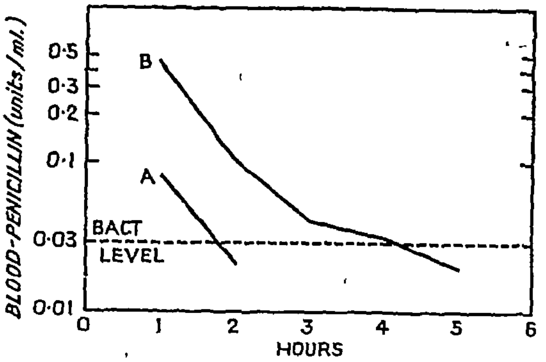

Fig. 4—Average readings from 4 patients given calcium penicillin 50,000 units by mouth: A, without caronamide; B after caronamide had been given for 24 hours.

it was not present in the blood in detectable amounts for as long as two hours, but after caronamide had been given the blood-penicillin level was five times as high, and the effect lasted for four hours.

These results are so striking that it seems possible to us that caronamide may interfere with the destruction of penicillin in the alimentary tract besides delaying its excretion by the kidney. To clarify this point the urinary excretion of penicillin is being determined. The results will be published later.

Inhibition of Tubular Function.—Of 19 of the patients in this study, when the phenolsulphonephthalein test was carried out, 15 had a reduction of excretion in the first hour to less than 70% of the control reading. In only 1 of the 4 remaining patients were the blood-penicillin levels significantly altered. These preliminary observations suggest that the phenolsulphonephthalein test is a simple clinical guide to whether the excretion of penicillin by the renal tubules is being adequately inhibited.

Toxicity.—Of 24 patients who received an average dose of 60 g. of caronamide in two and a half days, none had renal damage as shown by a raised blood-urea-nitrogen level or by the appearance of albumin or of cellular elements in the urine.

Caronamide was invariably present in the urine in solution and could be precipitated by the addition of dilute acetic acid. The precipitate first appeared when the pH of the urine reached 5, and was maximal at pH 4. Because of the considerable acidity required for precipitation it is probably unnecessary to alkalinise the urine, but an adequate output of urine should be ensured.

In 22 of the 24 cases a substance was detected in the urine which reduced Fehling's and Benedict's solutions. Its exact chemical composition is at present unknown. Though it gives a positive Bial's orcinol test, reactions for glycuronic acid have been consistently negative (Rapoport et al. 1948); and, though it is likely to be a pentose, attempts to isolate the osazone have so far been unsuccessful. This substance appeared in the urine when caronamide was being given alone as well as during the administration of penicillin.

Of the 24 patients 2 complained of headache and 1 other of slight nausea. No drug rashes or drug fever were noted (cf. Boger et al. 1947).

DISCUSSION

Our findings are in agreement with the recent American work. They show that caronamide can be given by mouth in doses sufficient to delay the excretion of penicillin and to raise the blood-penicillin levels. Systemic toxicity is apparently low. There is no evidence of damage to the kidney, and the tubular inhibition is readily reversed by stopping the administration of caronamide.

It may be taken as axiomatic that all potent dr are two-edged weapons capable of producing toxic effec Unfortunately in the case of many preparations seve years may elapse before these are clearly recogni For this reason a drug which interferes with tubu function, no matter how harmless it may appear, sho be used with caution. This is especially the case w caronamide because of the appearance in the ur of a reducing substance which is apparently a pent and may well be a product of disorganised cellu metabolism.

For these reasons we suggest that, until caronam has had a more extensive clinical trial, its use sho be restricted to those cases in which the maintenance high blood-penicillin levels is essential.

This study was suggested by Prof. D. M. Dunlop, to wh we are indebted for advice and criticism. We are grat to Dr. Beyer, of Messrs. Sharpe and Dohme Ltd., Philadelp for the supplies of caronamide, and to Dr. H. M. Walker, Glaxo Laboratories Ltd., for the supplies of penicillin.

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MASS DEATHS OF INFANTS

RÔLE OF CROSS-INFECTION

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THE possibility of cross-infection is a strong argum against nursing infants in hospitals. For this rea some authorities insist that babies should be nursed home, and utterly condemn their admission to insti tions. Not only does mass nursing help to spread cr infection, but also it is possible that the pathogenic and virulence of organisms in a hospital may be lug than they are outside, the continual change of patie leading to increased virulence by passage.

The incidence of cross-infection is most clearly sho by the mortality of children in hospitals. For instan Van Ingen (1915) reported that of 28,210 infants un 2 years of age in foundling hospitals in the State New York in 1910–15, 42·25% died, though the gene mortality of infants in that State in the same age-gro was only 8·7%.

EPIDEMIC DIARRHŒA

Since 1924, and to an increased extent since 19 epidemics of diarrhœa with a high mortality have be reported from neonatal wards and nursing-hom I experienced similar epidemics in 1939, 1940, and 19 in a big lying-in section of a hospital. The characterist of all these outbreaks were much alike.

Onset.—In the neonatal wards or nurseries, isolat cases of digestive trouble suddenly arose, the ch initial symptoms being refusal of food and changes the stools. The disease then spread explosively like epidemic. Some of the babies from the neonatal war when infections, especially those of the skin, arise in the nursery bathing of babies must be stopped altogether, as the bath cannot possibly be properly disinfected. The need for the greatest cleanliness was repeatedly urged on the nurses, but perhaps not always properly observed by these inexperienced attendants, especially at night. Feeding difficulties were treated by careful feeding; drugs such as 'Tannalbin,' 'Rivanol,' and sulphonamides were used where indicated; food was given by tube to avoid vomiting; and infusions of saline and glucose were given. Severe cases from the homes at Wolfsburg and Rühen were sent to hospital. Attempts were made to identify the causal organism by bacteriological examinations of water, milk, and stools —but without success.

All this shows that in all four homes the true cause of the catastrophic consequences of nursing patients in these homes was not recognised; the risk of cross-infection was not properly appreciated. Thus doctors came to look on the mass deaths as inevitable and due to factors beyond medical control. The physicians of the four homes attributed the mass deaths to lack of mother's milk, insufficient adaptation of the infants to artificial feeding (Eastern European babies having for many generations been breast-fed), and innate lack of vitality, the result of the mother's working too long before her confinement, of her being insufficiently fed, and even of psychological influences (unwanted child, depression by separation from her country), and of attempts at abortion.

DISCUSSION

Mother's milk undoubtedly provides some protection against pyogenic infections, but in epidemics of gastro-enteritis the babies fall sick whether they are fed on the breast or artificially. The assumption that a newborn baby is less well adapted to artificial feeding because its parents and ancestors have been breast-fed contradicts [illegible] only the law of non-inheritance of acquired factors [illegible] all experience.

[illegible] some extent the unborn child may be injured by the mother living in bad conditions during her confine-[illegible], perhaps also by psychological influences, but certainly not by attempts at abortion. The birth-weight of babies is lower in war-time than in peace-time, and the baby's reserves of vitamins are certainly lower than normal, but on the whole the child grows in the mother's body like a parasite—i.e., it takes what is necessary for [illegible]ding its body if it is available.

The influence of mass nursing has been thoroughly [illegible]construed in these cases. The view of the physician in one of the homes is typical:

> "Taking the babies born with a lack of vitality and incapable of sufficiently adapting themselves to artificial feeding, had they been left to the individual care of their mothers, without being breast-fed by them, just as many of them would have died (though relatively fewer in special homes), simply because they were weak by birth and not accustomed to artificial feeding."

This is wrong; the truth is just the opposite. Reared in a family by their mothers (or other persons) they would have been endangered neither by cross-infection nor by gastro-enteritis of the newborn, even though they were artificially fed or their birth-weight was below normal owing to war conditions. It is tragic that such mistakes should have led to non-recognition of the true causes of the catastrophe and thus have contributed to the deaths of a large number of children.

SUMMARY

Cross-infection, previously believed to have been overcome, is still adversely affecting the results of nursing infants in homes.

It is chiefly responsible for the epidemics of infantile diarrhœa, which in many places have led to mass deaths in neonatal wards and infants' homes.

The information published up to now on this condition is tabulated, and the clinical features, course, treatment, prognosis, ætiology, and prevention are discussed.

The unfavourable influence of war on cross-infection is explained, with special reference to infants' homes for displaced persons in Germany.

The following suggestions are put forward:

(1) Homes and other large institutions for infants are permissible only in times of emergency, and even then they must meet all requirements with regard to equipment and nursing and medical staff.

(2) The healthy child should be born and reared in the family to avoid the danger of epidemic gastro-enteritis.

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PARA-AMINOBENZOIC ACID IN LEUKÆMIA

EFFECT ON THE LEUCOCYTE-COUNT

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Though leukæmia has been accepted as a neoplastic disease by Willis (1948) from considerations of morbid anatomy, and by Furth (1946) from experimental evidence, and though this view is supported by most hæmatologists, nevertheless the tissue-culture experiments of Israëls (1940) still hold out the faint hope that maturation of the leukæmic cell can proceed to the normal leucocyte under suitable nutritional conditions. To pursue this possibility we have used *p*-aminobenzoic acid, a well-established essential metabolite for many bacteria, in the treatment of leukæmia.

Five cases of chronic myeloid leukæmia, one of chronic lymphatic leukæmia, and one of acute leukæmia were treated.

Dosage.—The dose of *p*-aminobenzoic acid was related to that used in the treatment of rickettsial infections. All the patients received 0·5 g. per lb. of body-weight per 24 hours, divided into 2-hourly doses from 6 A.M. to 10 P.M. Blood concentrations were estimated daily by a modification of Bratton and Marshall's method for sulphonamides. Values between 60 and 100 mg. per 100 ml. of blood were obtained after the first 24–48 hours.

RESULTS

All five patients with chronic myeloid leukæmia showed a remarkable drop in the total leucocyte-count, irrespective of whether radiotherapy had been previously given or not. Within 21 days the total leucocyte-count could be brought in all cases to within normal limits, institution is the only possible way of extinguishing an epidemic. With this my experience makes me agree.

EFFECT OF WAR

Such epidemics having already been observed in peace-time it is only natural that war should aggravate them. Steinert (1921) stated that from 1913 to 1916 in the foundling hospital in Prague mortality rose from 4·7 to 15·8%. The reasons why a war increases cross-infection are chiefly to be found in the following facts:

(1) The longer a war lasts, the more primitive conditions generally become, especially so far as they relate to children (cleanliness, lack of linen and soap, shortage of nurses, industrial employment of the mother, &c.).

(2) Modern war, particularly aerial war, and the employment of foreign labourers with their families, especially the employment of foreign women, lead to overcrowding of infants because of the establishment of numerous homes or hostels where babies and young infants, generally separated from their mothers, are inevitably exposed to the dangers of mass nursing, an accumulation of infections, and gastro-enteritis. People had forgotten how easily infants fell ill; and with the necessity for evacuating children as a protection against raids the consequences of such measures were at first lost sight of.

(3) With the mass movements of armies, evacuees, or displaced persons there was an increased exchange of bacteria among the population, leading to an increase in virulence by passage.

During the late war reports of German epidemics were not published, and, with few exceptions, foreign literature was unobtainable in Germany. In England Field and her colleagues (1943) reported a case-mortality of 80% among infants with gastro-enteritis at an emergency children's home. In June, 1946, Dr. Goebell wrote (private communication), that in Düsseldorf "many epidemics of gastro-enteritis are again raging in hospital nurseries, some with an enormous mortality." From a camp in Oksboel, Denmark, where many German refugees from East Prussia were accommodated I had news by letter that "all children under 2 years of age died of diarrhœa." The *Daily Mail* of May 29, 1946, reported that, in five ships carrying wives and babies of American soldiers from England to the U.S.A., a "mysterious illness" broke out, which appears to have been severe epidemic diarrhœa. The babies had assembled in a camp, where they awaited sea transport. Presumably conditions in that camp were not ideal, or the massing led to cross-infection. To prevent further damage the right decision was taken—to stop the transport of babies until they were older. Dr. A. Peiper reports (private communication) that he saw a severe epidemic of dyspepsia in newborn infants with at least 10 deaths in a short period during 1942–43 at Wuppertal. These were mainly breast-fed babies. The *Times* (Dec. 16, 1946) and the *Sunday Express* (Dec. 22, 1946) reported minor epidemics among babies, with a total of 30 deaths, which had occurred in Leicester (15 deaths) and other English cities. The morbidity was apparently somewhat higher, but figures were not quoted.

WAR NURSERIES IN GERMANY

Far more serious examples of cross-infection were noted in camps established for babies of displaced persons from the East by numerous armament factories all over Germany. The central authority (with an eye only to the labour pool) ordered that "in a simple but hygienic manner" homes were to be established for newborn and other babies of displaced persons from the East; that babies were generally to be looked after by women of the same nationality; and that the mothers should go to the hospital nursery not earlier than a few days before their confinement, and should resume work, at the latest three weeks post *partum*, when the newborn babies were to be brought into babies' homes. These orde presumably drawn up without consulting a doctor, a certainly without the advice of a child specialist, (not take into account the consequences of overcrowdi of infants separated from their mothers and looked af by insufficiently trained women. These orders led cross-infection on a large scale, like a mass experime though it was not recognised as such by inexperienc doctors and still less by the laity.

EPIDEMIC DIARRHŒA IN INFANTS IN INSTITUTIONS

Authority	Year(s)	Place	No. of cases	Case-mortali (%)
Cohen et al. (1933)	1933	Brooklyn Hospital, New York	175	35
Rice et al. (1937)	1934–37	19 hospital nurseries in New York	505	46
Cooper (1937)	1937	Royal Children's Hospital, Glasgow	300	47
Greenberg and Wronker (1938)	1937	New York Babies' Home	52	23
Smellie (1939)	1939	Children's Hospital, Birmingham	500	10
Campbell and Cunningham (1941)	1937–39	Park Hospital, London	574	29
Brehme (1943)	1939–41	Ward for newborn, Landeskrankenhaus, Brunswick	53	12
Goebell (1943)	1939 1940	Various hospital nurseries, Düsseldorf	148 231	23 15
Brehme (unpublished)	1939–41	3 epidemics in Brunswick	120	40

After the end of the war I studied the conditi in four of these homes for babies of displaced pers from the East. The infants had been accommodat in huts, some of which were furnished quite adequatel but, though kept fairly clean, were often infested w bugs. There was a sufficient supply of medicine a appropriate food, but linen was rather scarce. Th nurses were female displaced persons from the Eas trained by German nurses. The doctors were very bus with other practice and were assisted by foreign docto medical students, or midwives. The children's home Broitzemerstrasse, Brunswick, was staffed by forei doctors only.

So far as the records could be obtained, the infan either developed furuncles and then died of sepsis, more usually, contracted a typical epidemic gastr enteritis. The mortality in these homes was extr ordinarily high in comparison with the figures usual accepted for nursing-homes before the start of this ne phase of cross-infection, characterised by epidemics gastro-enteritis of the newborn. Nevertheless, it is with the limits of the American, British, and German figur shown in the accompanying table. The mortality four German homes for displaced persons studied b me was as follows:

Home	*No. of infants in home*	*No. of deaths*
Velpke	102	89 (87%
Wolfsburg	About 80	About 45 (56%
Rühen	" 490	" 285 (58%
Brunswick (May, 1943, to June, 1944)	351	" 174 (50%

The doctors and nurses in the homes repeatedly trie to get better results. Furunculosis was treated in th usual manner with lotions, ointments, dressings, an surgery. Bathing ill and healthy babies in the same bath sometimes in the same water, unfortunately encouraged the spread of the boils and perhaps also of diarrhœa. Steinert (1921) expressly points out in his report that and depressed at high concentrations of *p*-aminobenzoic acid.

We wish to thank Messrs. Ward Blenkinsop and Co. for supplies of *p*-aminobenzoic acid, and Dr. R. R. Bomford, Dr. A. E. Clark-Kennedy, Dr. F. Ellis, Dr. Horace Evans, and Prof. C. Wilson for access to patients under their care.

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DESPECIATED BOVINE SERUM

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EDWARDS (1944), working in the Department of Surgery in the University of Liverpool, described a method of preparing despeciated bovine serum as a substitute for human plasma. Later he recorded its use in 200 cases (Edwards 1946). Since then Massons (1946) in Barcelona has reported favourably on the use of a very similar formol-ammonia-heat-prepared serum in 200 cases and in 1000 experimental injections. Elka et al. (1947) confirmed his experience, but Bing (1948) and Boesen et al. (1948) found that in serum prepared by the method of Massons the osmotic tension was reduced by 50% and that it was still capable of toxic and antigenic effects.

In Edwards's original method the serum was separated, diluted with water in the proportion of 4 parts of serum to 1 part of water, bacterially filtered, despeciated, and collected in sterile bottles. Despeciation was effected by adding formol and sufficient ammonia to convert the excess formol to harmless hexamine. This prevented coagulation during the next stage, when the serum was heated to 72°C for 30 min. Edwards considered that the despeciating factor was heating to 72°C and not the addition of formol and ammonia. He showed that the addition of these substances to bovine serum without heating did not lead to despeciation. Jacobs and Sommers (1939) had shown this to be true for many mammalian sera.

This work was carried further in this department to discover the chemistry of this change and the exact nature of the end-product. It soon became evident that the chemistry of formol proteins was very complex and ill understood, and that it would be difficult to prove that serum prepared by this method was protein of high molecular weight acting in every way like the human plasma proteins and therefore a satisfactory substitute for human plasma.

Because of these difficulties a simpler method of preparation without using formol was sought. Accepting Edwards's belief that heating to 72°C was the all-important despeciating factor, we looked for other methods of preventing coagulation on heating, and found it possible to avoid coagulation by adding, before heating the serum, sufficient sodium hydroxide to bring the pH to 9. The serum showed an exactly similar physical change to that described by Edwards, assuming a greenish opalescence and a slight fluorescence. In heating the serum we fulfilled the exact instructions laid down by Edwards, bringing the serum to 72°C by raising the water-bath temperature from 60 to 75°C as rapidly as possible and maintaining it for 30 min. The product was cooled and the pH returned to pH 7 by the addition of hydrochloric acid.

This at first sight appears to be a more simple method, gaining the same ends and avoiding the use of formol. Serum treated in this way lost its power of agglutination and hæmolysis when added to human blood.

Experiment I.—Serum was added in equal quantities to four batteries of 40 test-tubes each containing a sample of human blood of a different group or subgroup. At 2 hours and at 24 hours, both at room temperature and at body temperature, the tubes were examined. In no tube was there hæmolysis or agglutination. A similar control series with untreated serum led to agglutination and hæmolysis in every tube.

We were satisfied that the agglutinins and hæmolysins had been destroyed by this process.

To discover the composition of the product we submitted samples of the serum for electrophoretic and ultracentrifuge examinations at the Lister Institute for Preventive Medicine. The report showed that our product was far from satisfactory:

Report.—"It was obvious from the ultracentrifuge runs and by analysis of the plates that 90% of the protein was aggregated in the samples B and C, and this aggregated material sedimented to the bottom of the cell very rapidly when the rotor speed reached 20,000 r.p.m. The residual protein appeared to sediment, like normal albumin, at 60,000 r.p.m.

In the electrophoresis apparatus the normal plasma showed albumin and α, β, and γ globulin; but no fibrinogen was detectable. Both the despeciated samples appeared to consist electrophoretically of a single abnormal component essentially with a trace of albumin."

Protein osmotic tension was estimated at the Lister Institute by the method of Adair and Adair (1925). The sera were dialysed against $M/15$ phosphate buffer ($M/30$ KH_2PO_4 + $M/30$ $Na_2H\ PO_4$) of pH 6·8. The same buffer mixture was used as outer fluid in the osmometers, which were equilibrated for 14 days at 0°C. The osmotic pressures of the sera were measured in mm. of protein solution and calculated as mm. Hg after measurement of the densities by pyknomity at 0°C. This showed a protein osmotic tension of only a fifth of that of the original serum from which it was prepared:

	Osmotic tension (mm. Hg at 0°C)	*Density*
Normal plasma	10·63	1·0201
Despeciated plasma	1·97	1·0210

BIOLOGICAL EXPERIMENTS

The object of these experiments was to observe, by repeated injections, whether this prepared serum was truly despeciated—i.e., whether it had been rendered incapable of producing anaphylaxis. For this purpose we used three groups of guineapigs.

Group 1 we used as a control so that we might be well acquainted with the features of anaphylaxis in guineapigs. We injected two guineapigs intraperitoneally with 2 ml. of raw bovine serum as a sensitising dose, followed a month later by 5 ml. Both guineapigs manifested anaphylaxis within 5 min.; one recovered in 4 hours, and the other died a typical anaphylactic death.

Guineapigs are particularly suitable for this work, since they readily manifest easily recognisable anaphylactic phenomena when injected after being sensitised with foreign protein. In a sensitised guineapig, within 2–3 minutes of the intraperitoneal injection of foreign protein, in a full attack, the animal becomes stationary its fur becoming ruffled and erect, especially over the dorsal spine. The guineapig often emits sneeze-like sounds, and there is much nose-rubbing with the front paws. Often the guineapig becomes apparently ataxic and lies with both back legs outstretched, or it may fall to one or other side. Respiratory difficulty follows, with increasing difficulty in expiration.

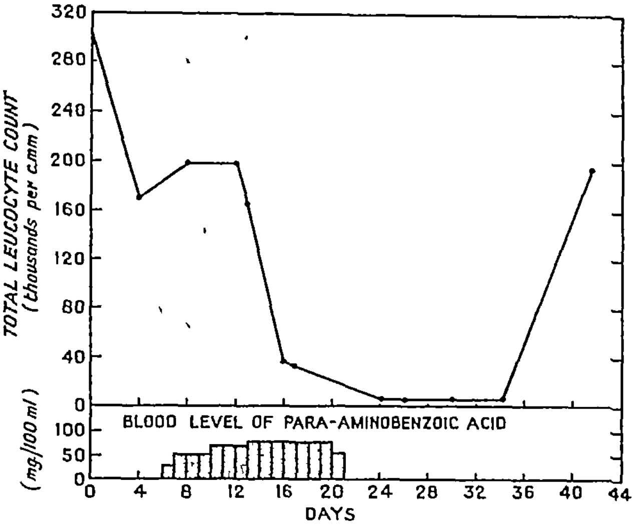

Fig. 1—Leucocyte-count in relation to blood concentration of *p*-aminobenzoic acid in chronic myeloid leukæmia.

but on cessation of treatment the count rose rapidly to its former value. Typical results are illustrated in figs. 1 and 2, and blood films before and during treatment in a typical case are shown in figs. 3 and 4.

After the count had returned to its former value a second course of treatment again produced a similar rapid fall. The differential count of the leucocytes in the peripheral blood and in the sternal marrow remained unchanged.

A case of lymphatic leukæmia with an initial leucocyte-count of 100,000 cells per c.mm. was treated for 15 days; and, although the percentage of polymorphonuclears in the blood decreased, the total leucocyte-count was unchanged.

A case of acute myeloblastic leukæmia was treated with full dosage, but the total leucocyte-count rose during treatment.

Other Effects.—In two cases the hæmoglobin content of the blood fell, in one case it remained constant, and in two cases it rose slightly, but the rise was negligible compared with that obtained when the patients were subsequently treated with radiotherapy.

Counts in all seven cases showed no change in the number of platelets.

In all five cases of myeloid leukæmia the spleen became appreciably smaller.

Toxic Symptoms.—To prevent acidosis the *p*-aminobenzoic acid was given as its sodium salt, produced by neutralisation with sodium bicarbonate. During treatment the plasma-bicarbonate was estimated daily. A drop of up to 20 c.cm. of CO_2 per 100 ml. of blood occurred in all cases, but no serious symptoms of acidosis appeared. All seven patients complained of slight nausea, but only one vomited. The most seriou toxic effect was unexplained hæmorrhage, which di not appear to be due to a deficiency of prothrombin vitamin C, or platelets. A tourniquet test did not reve any increased capillary fragility. The tendency to hæmor rhage remained unexplained, but it was probably due t a local infiltration of the walls of small vessels wit leukæmic cells, the vessels being also slightly damage by the *p*-aminobenzoic acid. Two patients died, but a necropsy only the post-mortem appearances of deat from chronic myeloid leukæmia were found.

DISCUSSION

Bichel (1948) treated six cases of chronic myeloid lymphatic leukæmia with *p*-aminobenzoic acid and th leucocyte-count rose abruptly in all of them. Zarafonet et al. (1948) treated five cases of chronic myeloi leukæmia and in each case obtained a profound dro in total leucocyte-count. Our results confirm the latt work. The discrepancy between Bichel's results and ou lies in the amount of the *p* aminobenzoic acid given.

As in the growth of certain bacteria, *p*-aminobenzoic acid can act as a stimulus to cell division at low concentrations and as a depressant in high concentrations (Sevag 1946), an action similar to that of hydrocyanic acid and other poisonous substances. Our results were due to its effect not as an essential metabolite but as a toxic substance with a far higher toxicity for granular cells of the myeloid series than for cells of the lymphoid serie for very primitive hæmic cells.

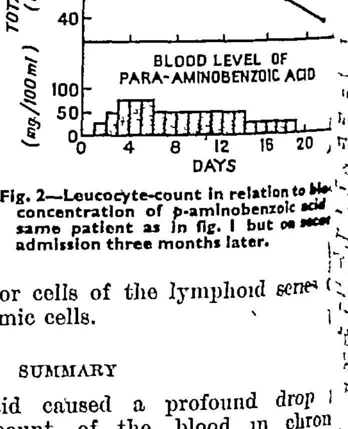

Fig. 2—Leucocyte-count in relation to blo concentration of *p*-aminobenzoic acid same patient as in fig. 1 but on seco admission three months later.

SUMMARY

p-Aminobenzoic acid caused a profound drop i the total leucocyte-count of the blood in chron myeloid leukæmia when administered in doses of 50 a day.

The hæmoglobin content of the blood was also reduc but not so much as the leucocyte-count.

The patients' general condition was little affected, b toxic symptoms were occasionally severe.

The division of myeloid cells, like bacterial multipl cation, appears to be stimulated at low concentratio

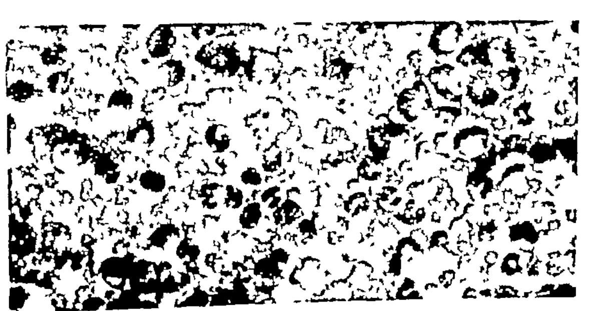

Fig. 3—Blood smear of patient with chronic myeloid leukæmia before treatment with *p*-aminobenzoic acid.

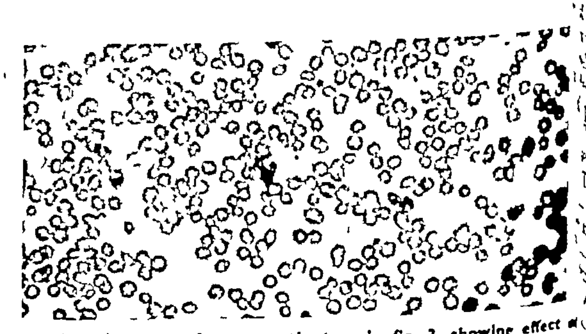

Fig. 4—Blood smear of same patient as in fig. 3, showing effect of *p*-aminobenzoic acid.

p-AMINOSALICYLIC ACID

DETERMINATION IN BLOOD AND CEREBROSPINAL FLUID

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LEHMANN[1] mentions the use of Ehrlich's *p*-dimethylaminobenzaldehyde reagent for the determination of *p*-aminosalicylic acid in blood, but gives no details. We have developed the following method using Ehrlich's reagent, which is based on Morris's[2] method for sulphanilamide. The method has given satisfactory results in clinical trials in this hospital.

METHOD

Reagents

1. *p*-Toluenesulphonic acid, 20 g./100 ml. 0·2N HCl.
2. Disodium hydrogen citrate solution, 0·75*M* (39·4 g. of citric acid, dissolved in 188 ml. 2N NaOH solution, and diluted to 250 ml.).
3. *p*-Dimethylaminobenzaldehyde, 2 g. A.R. in 95% ethanol (100 ml.).
4. Sodium *p*-aminosalicylate standard. The anhydrous salt (11·4 mg.) or the dihydrate (13·8 mg.) is dissolved in 100 ml. water to give the equivalent of 10 mg. *p*-aminosalicylic acid/100 ml.

Procedure

Oxalated whole blood, 0·5 ml., or cerebrospinal fluid (C.S.F.), 1 ml., is measured into a test-tube, made up to 7 ml. with distilled water, shaken well, and stood 3 min. to lake. Next 3 ml. of 20% *p*-toluenesulphonic acid is added slowly with shaking, and the mixture is allowed to stand a further 5 min. and then filtered (Whatman no. 40 or 42 paper).

To 5 ml. of filtrate (which must be clear) are added 1 ml. of citrate buffer solution and 2 ml. of 2% *p*-dimethylaminobenzaldehyde reagent. The orange colour develops at once and is stable for some hours.

The colour is measured with a photo-electric photometer using a blue filter (e.g., Ilford no. 602). A reagent blank is used consisting of 1·5 ml. of *p*-toluenesulphonic acid, 1 ml. of citrate buffer, and 2 ml. of Ehrlich's reagent made up to 8 ml. with water.

Standards

Three standards are used, containing sodium *p*-aminosalicylate equivalent to 20, 10, and 4 mg. of *p*-aminosalicylic acid/100 ml. From the 10 mg./100 ml. standard 1, 0·5, and 0·2 ml. portions are each made up to 7 ml. with water, and 3 ml. of *p*-toluenesulphonic acid is added to each. Then 5 ml. portions of these mixtures are treated with 1 ml. of citrate buffer and 2 ml. of *p*-dimethylaminobenzaldehyde reagent. A calibration curve is constructed from the three standards, and the *p*-aminosalicylic acid content of the unknown is deduced from it.

RESULTS

Experiments in which *p*-aminosalicylic acid has been added to various body fluids in quantities equivalent to 20, 10, and 4 mg./100 ml. have given the following recoveries: plasma (oxalated) *cir.* 100%, whole blood (oxalated) *cir.* 80–90%, C.S.F. *cir.* 100%.

In two series of experiments added streptomycin (50 µg./ml. plasma) did not interfere with the determination of *p*-aminosalicylic acid.

Since the colour reaction is a general one for primary aromatic amines, it cannot be used for the determination of *p*-aminosalicylic acid if other primary aromatic amino-compounds (e.g., sulphanilamide derivatives) are likely to be present.

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1. Lehmann, J. *Svenska Läkartidn.* 1946, 43, 2029.
2. Morris, C. J. O. R. *Biochem. J.* 1941, 35, 952.

Reviews of Books

Fungus Diseases of the Lungs

DAVID T. SMITH, M.D., professor of bacteriology and associate professor of medicine, Duke University, North Carolina. Springfield, Ill.: C. C. Thomas. Oxford: Blackwell Scientific Publications. 1947. Pp. 59. 10*s*. 6*d*.

THE rapid advance of medical mycology has created a demand for monographs on the mycoses of individual anatomical systems. It is fitting that the first should be one on the fungus diseases of the lungs, which are probably the easiest, and certainly the most important, portal of entry for pathogenic fungi. Professor Smith's little book (no. 2 of the American Lecture Series) describes, adequately but briefly, the symptoms, clinical and mycological diagnosis, and treatment. A conflicting statement needs correction: the remark that "the lungs are rarely, if ever, the site of primary infection" in histoplasmosis is followed two pages later by a reference to "tens of thousands of primary pulmonary infections" in this disease. Such slips do not, however, detract from the value of a useful guide to a group of pulmonary disorders all too often misunderstood. It is to be hoped that Dr. Smith will expand this work into a much-needed book of reference.

Symposium on the Use of Isotopes in Biology and Medicine

Madison: University of Wisconsin Press. 1948. Pp. 445. $5.

THIS book is the report of the symposium held at Madison, Wisconsin, in September, 1947. It was produced as quickly as possible, by a photolithographic process, and the various authors had no opportunity for proof-reading; but there are few errors, and a comprehensive list of errata is provided. The subjects discussed are all of topical interest and the articles are in the form of short reviews arranged in good logical order. The historical background for isotopes in biochemistry is given by Hans T. Clarke. Urey and Seaborg write of the separation of stable isotopes and the preparation of radioactive isotopes respectively. Nier discusses the mass spectrometer, and Coryell and Kamen the detection and measurement of radioactivity in radioactive isotopes; and there is a series of articles on the use of tracers in research on the metabolism of proteins, carbohydrates, lipids, and minerals. The medical applications of radioactive tracers, both for physiological and therapeutic use are considered at some length. Moreover, the measures to be taken to protect the health and property of the users of radio-isotopes are not forgotten. This report should be invaluable to those about to enter on investigational work with radioactive or stable isotopes, and to those with some experience in this field the articles will certainly be of interest.

Vitamine und Vitaminetherapie

Prof. Dr. Med. EMIL ABDERHALDEN, director of the physiological chemical institute, University of Zurich; Prof. Dr. Med. GEORGES MOURIQUAND, director of the Children's Hospital, University of Lyons. Berne: Huber. 1948. Pp. 408. Sw. fr. 28.

THIS is the first of a series of therapeutic handbooks to be published under the general editorship of Prof. T. Gordonoff of Berne. The object of the series is to provide, in nine relatively small volumes, each written by two or three experts, authoritative modern information. Professor Abderhalden has written the historical and biochemical part of this volume (188 pages) and Professor Mouriquand the clinical section. The first part carries a historical survey followed by more detailed treatment of each of the vitamins of the B complex, the fat-soluble vitamins with their provitamins and analogues, and the essential fatty acids and amino-acids. This section is copiously illustrated by photographs and structural formulæ, and closes with tables of vitamin food values and human requirements. In the second part Mouriquand distinguishes exogenous and endogenous—or as we would say "conditioned"—deficiencies due to diseases of the

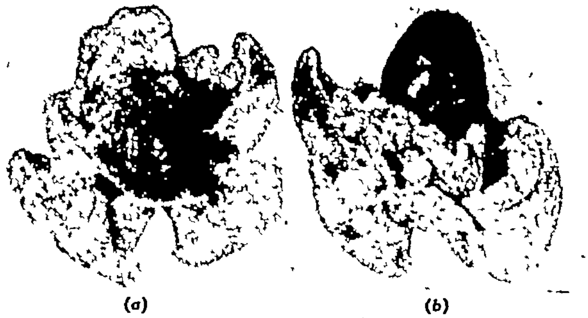

Fig. 1—Normal guineapig lungs and heart, showing collapse of lungs after removal from chest: *a*, anterior view; *b*, posterior view.

Group 2 consisted of four guineapigs which we injected intraperitoneally with 2 ml. of serum despeciated by our method of alkalinisation and heating, followed 30 days later by 5 ml. The results were as follows:

Guineapig 1: death from asphyxia in 2¹/₂ hours.
Guineapig 2: no effect.
Guineapig 3: slight effects with recovery.
Guineapig 4: death in typical anaphylaxis within 10 min.

Necropsy in the two guineapigs which died showed a picture of anaphylactic death with gross overinflation of the lungs, these did not collapse after the pleural cavities were opened and indeed remained inflated after they had been removed from the thorax.

Thus we demonstrated conclusively that our method of preparation of the serum did not destroy the antigenic properties of the bovine serum. We had failed to produce a despeciated bovine serum by alkalinisation and heating to 72°C. We had produced instead a substance composed of one grossly abnormal protein, with an osmotic tension only a fifth of that of the original bovine serum, which was still antigenic and capable of producing anaphylactic death in guineapigs. Whatever despeciation is produced by Edwards's formol-ammonia-heat method it is not due entirely to the heating as Edwards thought. Therefore despeciation by Edwards's method is probably du in part to the formolisation and in part to heating

RESULTS OF REPEATED INJECTIONS OF DESPECIATED BOVINE SERUM IN GUINEAPIGS

Guineapig no.	First injection (2 ml.)	Interval (days)	Second injection (5 ml.)	Interval (days)	Third injection (5 ml.)
1	Nil	35	Nil	59	Slight anaphylaxis
2	Nil	35	Slight anaphylaxis	59	Nil
3	Nil	35	Slight anaphylaxis	59	Nil
4	Nil	35	Nil	59	Died of pseudo-tuberculosis
5	Nil	35	Nil	59	Died of pseudo-tuberculosis
6	Nil	35	Nil	59	Nil
7	Nil	40	Nil	39	Nil
8	Nil*	..	..	..	..
9	Nil	40	Gross anaphylaxis	39	Nil
10	Nil	40	Nil	39	Died in well-marked anaphylaxis
11	Nil	40	Slight anaphylaxis	39	Nil
12	Nil	40	Nil	39	Nil
13	Nil	40	Nil	39	Nil
14	Nil	40	Gross anaphylaxis	39	Slight anaphylaxis
15	Nil	40	Nil	39	Well-marked anaphylaxis
16	Nil	40	Nil	39	Nil
17	Nil	40	Nil	39	Nil
18	Nil	40	Nil	39	Nil

* Died after 1st injection, with old infarcts in liver, probably from old age.

Group 3 consisted of eighteen guineapigs injectin repeatedly with formol-ammonia-heat-prepared serum The accompanying table shows that anaphylaxi developed in eight of the eighteen guineapigs; that i was of gross and undoubted nature in four guineapigs and that one guineapig (no. 10), died in 45 min. i well-marked anaphylactic shock. Necropsy reveale undisputed evidence of anaphylactic death with gro inflation of the lungs (compare figs. 1 and 2).

That only one of eighteen guineapigs died show that serum treated by Edwards's method loses som antigenicity, carrying a lessened risk of producin anaphylaxis in guineapigs. Nevertheless these exper ments show that it can still produce anaphylaxis an even anaphylactic death.

The guineapig is, of course, far more susceptible anaphylaxis than man; but one cannot overlook th fact that, though such serum has been used without mi hap in many hundreds of patients, its antigenicit and power to promote anaphylaxis are not complete destroyed by Edwards's method, and the potenti danger still remains. With extensive administration this serum to man, anaphylaxis will be seen Cauti should be exercised in its further use

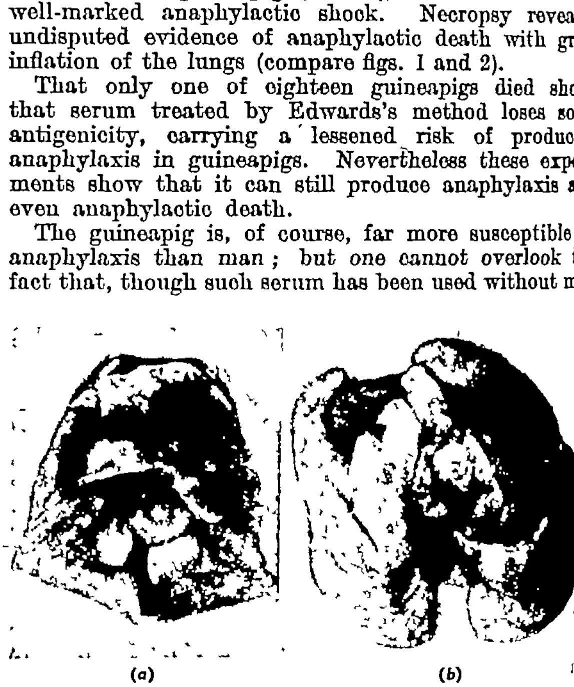

Fig. 2—Guineapig lungs removed from chest after death in well-mark anaphylaxis, showing maintained inflation of lungs due to bro spasm: *a*, anterior view, *b*, posterior view (same reduction as fig. 1).

SUMMARY

The degree of destruction of specificity secured Edwards's method of despeciating bovine serum is n due entirely to heating but to the formolisation a heating combined.

The specificity of the serum and its power of produci anaphylaxis are not completely destroyed by Edward method, and remain a potential danger in its use as substitute for human plasma.

Any process likely to remove effectively the specifici of bovine serum is likely so to reduce its osmotic effec as to render it unsuitable as a substitute for plasma f administration to man.

I wish to thank Dr. R. A. Kekwick and Dr. E. F. McCarth of the Lister Institute of Preventive Medicine, for the electr phoretic, ultracentrifuge, and osmotic-pressure reading Mr. W. Lee, of the central photographic departmen University of Liverpool; and Mr. Harold Nevin, technicia in the department, for valuable assistance.

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THE LANCET

LONDON: SATURDAY, OCT. 16, 1948

First Quarter

GENERAL practitioners in the National Health Service have now received their first quarterly payment. Few have read the figures on their cheques with any satisfaction: most have felt that the work already done (to say nothing of busier quarters to come) deserved greater reward. As remuneration is calculated on the basis of an 18*s*. capitation fee for 95% of the population, and as it was unlikely that in the first three months so many as 95% would register, many doctors expected the first quarter to yield a comparatively high per-capita payment. Yet in most areas it has been less than 4*s*.

Several factors have contributed to reduce the amount. In the first place, the first four days of July, which came before the appointed day, were not included: and four days is almost 5% of a quarter. Secondly, no payments have been made during this quarter for temporary residents: credits accruing from these will be paid in next quarter's cheque. More importantly, the executive councils, being still unaware of their final commitments, have generally erred on the side of caution in making the first interim payment; to cover later eventualities they have kept something in reserve which will not be distributed until the final settlement next year. By that time the position should be clearer. It is known, for example, that there has been a considerable duplication of names, chiefly through form E.C.1 being forwarded in respect of patients already included in old panel lists; and until each form is checked and cleared some inflation is bound to persist. Again, the number of likely claims for treatment of temporary residents cannot be exactly foretold; nor has the total of mileage points claimed yet been calculated. A margin must be left for all of these, and each margin further reduces the amount of the pool available for initial distribution. Calculations of this type always had to be made before National Health Insurance cheques could be paid, and, once the numbers of the insured population in an area had become relatively stable, no great difficulties arose, and no inordinate balance had to be kept back for final distribution. But there remains one problem where no precedent can be quoted and where the needs and the decisions have varied widely from area to area. This is the problem of the "basic salary," or fixed annual payment. So much has the demand for this payment varied, and so little has general guidance been possible, that executive councils have had to make their own arrangements: and where they have thought fit either to grant a high proportion of fixed payments, or to put into reserve an appreciable sum for the eventual discharge of these payments, the remaining capitation fee has been proportionately depressed.

The right of a doctor to be remunerated in part by fixed annual payment has been progressively modified. The Minister of Health originally intended such payment to be universal; but the profession successfully opposed his wish to pay everyone partly by basic salary, and Mr. BEVAN eventually agreed that the fixed payment should be made only to those doctors who opted for it. When doubt arose whether such an arrangement would work fairly in the absence of restrictions, he accepted the British Medical Association's proposal that the fixed payment should not be made without specific approval of the local executive council: and after consultation with our representatives he indicated to executive councils certain categories of doctors to whom it might most justly be granted, including the doctor starting a new practice, or working up a small one, and the doctor unable, through age or ill health, to do as much as in the past. Little exception could be taken to extra help being offered to any or all falling into these categories, but the Minister went further when he suggested that the fixed annual payment might be made wherever "a doctor's income can be shown to have dropped substantially as a result of the new service involving an element of hardship." It is this last proviso, and its different interpretation by different executive councils and local medical committees, that has given rise to widely differing decisions. Some of the councils have asked that the doctor claiming the payment shall reveal his total income from all sources, and this has led to the charge that the Government are insisting on a means test for members of the profession.

Actually it is the doctors themselves who have demanded this income declaration from their colleagues, for the very pertinent reason that it is they who are paying from their own moneys the basic salaries that are granted. In putting forward the universal fixed payment the Minister arranged for it to be a first charge on the local pool of money from which the local executive council would pay the practitioners in its area. This would have been reasonably fair. It would in effect have provided a kind of sliding scale giving a higher average capitation fee for the man with the smaller list. But when the universal fixed payment was abandoned, and an optional one was substituted, it was decreed that the capitation fee for those doctors asking for the payment should be reduced by a seventh, and it became evident that any doctor with less than about 2200 patients would draw more from the pool if he was given a fixed payment than if he was not. Seeing that he obtains this extra amount at the expense of his colleagues with the larger lists, many local medical committees have refused to support applications unless they are satisfied that there is good reason for the claim. Some insist that the claimant shall reveal all sources of income and prove actual financial hardship; they treat the claim as a request for charity and they impose a means test. In present circumstances it is certainly permissible to say that no claim should be granted unless the whole picture of the doctor's practice is known. Obviously it would be unnecessary and unfair to subsidise the income of a junior partner, with a short list, if he was mainly employed in helping one or more senior partners with long lists, for each of whose patients full gastro-intestinal tract, the liver, and other organs, and discusses the outstanding clinical diseases due to the specific vitamin deficiencies, and their treatment.

The book is good and moreover has balance, which might well have been lacking in the joint work of a German biochemist and a French clinician. The first part is on the whole well documented, though with an understandable bias towards German and Swiss publications. No volume of this size can claim to mention everything connected with the subject, but it is a little surprising to find vitamin D_2 dismissed so summarily, and no reference made to the work of Harris and Moore in the late 'twenties on hypervitaminosis D. Phytic acid is not mentioned at all, and the section on resistant rickets and osteomalacia is distinctly dated, showing no grasp of the recent Anglo-American work on treatment. There are none of the vivid clinical descriptions which one expects of a French writer, and some of the photographs are disappointing. It is, however, easier to criticise than to create, and those who read German will value this book, since parts of it are probably better than anything current in English.

Lehrbuch der inneren Sekretion

F. VERZÁR, professor of physiology, University of Basle. Liestal: Ars Medici Lüdin. 1948. Pp. 609. Sw. fr. 52.

Professor Verzár has written a comprehensive and authoritative textbook on endocrinology primarily from the physiological point of view. The bibliography is full, and especially valuable to the English reader because it contains many Swiss and Continental references with which he may not be familiar. The treatise is up to date and is a reliable reference work. It can be recommended to those who wish their library of orthodox endocrine publications to be complete.

Science in Progress

(Fifth series). Editor: GEORGE A. BAITSELL. New Haven: Yale University Press. London: Oxford University Press. 1948. Pp. 353. 27*s.* 6*d.*

THIS volume can be classified under the heading of Popular Science for the Scientist. The ten essays in it, reprinted from recent issues of the *American Scientist*, are too technical to be understood by the complete layman, but are of just the right level of comprehensiveness and precision to appeal to scientists in other fields. Most of the contributors' names are household words in the medical profession: Peyton Rous, writing on tumours; G. W. Beadle, on biochemical genetics with special reference to the bread mould neurospora; Michael Heidelberger on complement fixation; C. C. Speidel on the study of living cells; and Herbert M. Evans on the hormones of the anterior pituitary gland. Other essays (on the interior of the earth, for example, or the betatron) are written by authors equally well known in their fields. The standard of writing is high and the essays are well documented. It is a first-rate book, and can be particularly recommended to those whose stomachs revolt at the sort of popular science which contrives to be at once patronising, pompous, and imprecise.

Bergey's Manual of Determinative Bacteriology

(6th ed.) Editors: ROBERT S. BREED, New York State Experimental Station (Cornell University); E. G. D. MURRAY, McGill University, Montreal; A. PARKER HITCHENS, University of Pennsylvania, Philadelphia. London: Baillière. 1948. Pp. 1529. 82*s.* 6*d.*

BACTERIOLOGISTS will welcome this new edition of "Bergey," whose publication in the United States we have already mentioned (1948, i, 952). Nevertheless, those accustomed to our binomial system of bacteriological nomenclature may turn the pages a little anxiously; for in previous editions bacterial species have often been moved from one genus to another, adding confusion to a difficult subject. Seeking familiar names, we find that *Staphylococcus aureus* now has the clumsy designation *Micrococcus pyogenes* var. *aureus*; but most British bacteriologists will be glad that *Eberthella typhosa* has gone, and they may even agree that *Salmonella typhosa* is less likely to cause confusion with typhus than *Salmonella typhi*. There are many similar changes, and even if we regret unstable nomenclature we must recognise the new if we mean to rea contemporary American and English literature. For th specialist there is something fresh in the presentatio of the relationships of every genus, and the number o species has increased from 1335 in the fifth edition t 1630 in this. Particularly valuable is a new index statin which organisms have previously been recorded from particular source. The orders Rickettsiales and Viral are in supplements: the viruses under the subgrou bacteriophage, plant, and animal viruses compris 13 families, 32 genera, and 248 species. Taxonomy becoming increasingly important, and the numero contributors to this edition have done important scientif work.

Investigations on Agonal Acidosis

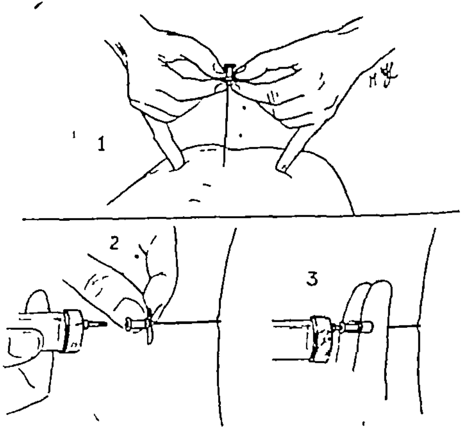
IB FABRICIUS HANSEN, translated by HANS ANDERSE M.D. Copenhagen: Poul Branners. 1948. Pp. 135.

THIS short book gives an account of the biochemi changes during the period immediately preceding deat in man. On some 38 moribund patients Dr. Hansen h carried out examinations of the pH, carbon dioxid chloride, urea, protein, hæmoglobin, oxygen, creatin guanidine, amino-acids, lactic acid, pyruvic acid, seru sulphate and phosphate, total acetone bodies, total bas and non-protein nitrogen. Mean values of the vario results are recorded, with full case-histories of ca patient and a large bibliography. The main findings a a fall in blood pH immediately before death, with increase in plasma lactic-acid content, which sometim is very great. Most cases showed a terminal azotæm with increased urea, amino-acid, and creatinine nitrog values. No relation has been demonstrated between t azotæmia and the fall of pH.

New Inventions

A SPINAL NEEDLE

THE main object of the modification here describ is to allow lumbar puncture to be performed without t point, shaft, or hub of the needle being touched. T needle is held throughout by two flanges which proje at right angles at the junction of the hub and shaf A two-handed stance allows counter-pressure to b exerted by the little fingers on either side of the spin column (fig. 1); in this way the needle is steadied and it direction controlled more easily.



Figs. 1–3.

If a spinal anæsthetic is to be given, the needle is hel in situ by a flange while the syringe is being attache (figs. 2 and 3). By this means fingers are kept away fro both the nozzle of the syringe and the hub of th needle.

The needles are obtainable in various lengths from $2^{1}/_{2}$ to 4 in., from the Longworth Scientific Instrument Co. Ltd., Thames Street, Abingdon-on-Thames, Berks.

R. R. MACINTOSH
M.A., D.M. Oxfd, F.R.C.S., D.A.

Oxford.

nty-four hours after infection. In two experi-nts mice were given a single dose by mouth before fection, and more than half survived though all ntrols died. The drug is said to be "strikingly n-toxic" in mice and monkeys. Tests have been ne on monkeys infected with poliomyelitis of human igin but the results are not reported. Apparently benosulphazole does not react with the SK virus vitro but inhibits its growth in tissue-cultures. It argued from this that its action is on the cell, not the rus. Surely this is an odd conclusion, for various ugs inactivate bacteria only during their active owth and viruses can only grow in living cells. particularly important point is that the drug's tivity is inhibited by *p*-hydroxybenzoic acid (the ect of *p*-aminobenzoic acid is not stated).

The picture in *Time*[3] is copied from an electron otomicrograph shown by E. De Robertis and O. Schmidt of the Massachusetts Institute of chnology at a meeting in Canada. This photograph a piece of the sciatic nerve of a rhesus monkey is d to show the poliomyelitis virus in the nerve. rlier work has demonstrated the remarkable ectivity of this virus for neurons and suggested t it probably spreads centrifugally within the oplasm of peripheral nerves. Bodian and Howe,[4] ng the immersion method of inoculation of the t end of the sciatic nerve in the rhesus monkey, owed that after a latent period of eleven hours the us progressed up the nerve at about 2·4 mm. per r. They tested for the presence of virus at different els by inoculating nerve intracerebrally into nkeys. According to the report, De Robertis Schmidt have observed bodies in poliomyelitis-d sciatic nerves of the monkey which were not a healthy nerves; and serial pictures revealed ent of these bodies up the nerve at the same as Bodian and Howe found for live virus. It long been recognised that the virus causes gible disturbance of axonal function as it moves g the nerves, but exactly how it progresses has been understood. These new revelations of the tron microscope suggest that the virus flows ively along the exoplasm. Most of the previous dies of the size and shape of the poliomyelitis us by filtration and the electron microscope have n on purified preparations of human stool or nal cord. According to the filtration experi-nts, the virus either is a sphere about 8–17 mμ diameter, or if it is asymmetrical, has a cross-tion of this dimension. Both American[5] and edish[6] workers have found rod-shaped particles 5–35 mμ in diameter in purified preparations of fected human stools and spinal cords, but they have nd similar particles in the stools of normal children ing in non-epidemic areas. The preparations from healthy" stools were not infectious for monkeys, ich suggests that the rod-shaped particles in both parations are flagella of bacilli or some other traneous matter to which the virus may be firmly tached in the infected specimens. Recently Loring al.[7] have concentrated the Lansing strain of virus obtained from infected cotton-rat brains in sufficient quantity to provide an antigen for a complement-fixation test. These advances in physicochemical methods of purification should eventually supply a preparation which will unravel this mystery.

Lymphocytes and the Adrenal Cortex

In discussing the formation and destruction of lymphocytes earlier this year[1] we described the evidence brought forward, particularly by Dougherty and White, in support of the view that adrenal cortical hormones control the process of dissolution of lymphocytes, that this dissolution leads to the liberation of γ-globulin, and consequently that the adrenal cortical hormones can be said to be concerned with antibody liberation and possibly with protein metabolism. The hypothesis was received rather coolly, and more recent work has been in several ways contradictory. Valentine et al.[2] set out to observe the effect of adrenocortical hormones on the number of lymphocytes appearing in the thoracic duct lymph of cats. They were careful to use adrenal cortex extracts and not the synthetic desoxycorticosterone, since it has been shown that the so-called "sugar" corticosteroids (i.e., those with the oxygen at C_{11} and C_{17} positions) are the important ones for hæmatological effects. Nevertheless the expected diminution of lymphocytes was not found—in fact there was no significant effect at all.

There seems to be no doubt that adrenocortical hormones produce macroscopic and microscopic involution of lymphoid tissue. It is also clear that injurious stimuli cause similar changes, and that the effects do not appear in adrenalectomised animals. There is much evidence to show that adrenal cortical hormones will produce a lymphopenia in normal animals. Most of the results were obtained in rats or mice, which normally have 60–90% lymphocytes in their blood compared with 20–40% in man. However, there have been some significant findings in man. Thus Hills et al.[3] gave a single dose of 25 mg. of pituitary adrenocorticotrophin to 8 normal persons and 38 patients with various diseases but all with intact adrenals; a definite reduction in the circulating lymphocytes followed. A similar course given to 26 patients with Addison's disease produced very variable results—the lymphocytes in the blood showed anything from a 31% increase to a 28% decrease—but a dose of 17-hydroxycorticosterone caused a definite lymphopenia in every one of 5 patients. It was also noted that if adrenocorticotrophin is given regularly for some days the lymphopenia disappears in 24 hours and may give way to a lymphocytosis; Hills and his colleagues have no explanation for this result. On the other hand, the evidence that patients with insufficient adrenal cortex, as in Addison's disease, have an increase in circulating lymphocytes is highly equivocal. For instance, Baez-Villaseñor and others[4] studied the blood picture in 100 patients with Addison's disease. They set the normal high level at 40% lymphocytes, with a normal leucocyte-count, and by this criterion 16% of their 28 untreated

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Time, Sept. 20, p. 28.
odian, D., Howe, H.A. *Bull. Johns Hopk. Hosp.* 1941, 69, 79.
elnick, J. *J. Immunol.* 1944, 48, 25.
ard, S. Purification of Poliomyelitis Viruses. Uppsala, 1943.
oring, H. S., Roffel, S., Anderson, J. C. *Proc. Soc. exp. Biol.*, N.Y. 1947, 66, 383.

1. *Lancet*, 1948, i, 412.
2. Valentine, W. N., Craddock, C. G. jun., Lawrence, J. S. *Blood*, 1948, 3, 729.
3. Hills, A. G., Forsham, P. H., Finch, C. A. *Ibid*, p. 755.
4. Baez-Villaseñor, J., Rath, C. E., Finch, C. A. *Ibid*, p. 769.

capitation fees were being drawn. It is to prevent such an abuse that some executive councils have ruled that a basic salary cannot be granted to one partner unless the other partners also accept this form of payment. A practitioner can fairly say: "I prefer to limit my list of patients to a number which enables me to give unhurried service to them; in return for this I ask that I shall be paid proportionately more per patient; and so I claim the fixed payment." Before he does this he should be prepared to reveal the whole pattern of his practice so that the council may be assured that the time saved by having a shorter list can in fact be devoted to his panel patients, and will not be absorbed by paid appointments at clinics or hospitals, or by attention to an excessively large proportion of private patients. On the other hand for an executive council to declare that the doctor with private means or a wealthy wife shall be excluded from a method of payment that could legitimately be claimed by another practitioner, doing identical work, is wholly improper. The basic salary should not be regarded as a sort of alms, provided obligatorily by the busier doctors, to be doled out to the deserving poor among their colleagues, but as a means of obtaining sound conditions of practice, for doctors and patients alike.

At the moment conditions of practice are not conspicuously sound, and it would be useful to have an assurance that defects will be quickly remedied where necessary. As things stand today, the general practitioners are certain that their first payment in no way fulfils the promise of the first Spens report, and few believe that adjustments in coming quarters, when all errors and omissions have been rectified, will bring their remuneration into line with the Spens recommendations. Moreover it has become painfully obvious that a universal capitation system, unless more carefully compensated, works to the disadvantage of many of the doctors with the highest standard of practice.[1] Difficulties and anomalies of this kind were bound to arise, and some of the problems will solve themselves; but we trust the Minister will recognise the need for an immediate review of the subject as a whole, either with the Negotiating Committee or by the Whitley Council. Such a review should cover not only the amount of remuneration but also the sources of its various fractions. There are strong reasons why the sums that are not paid universally—e.g., the mileage, the inducement payment, and the fixed annual payment —should come from a fund kept separate from the main capitation pool. The inducement fund is already a separate fund; the mileage used to be, and could be again. The fixed annual payment could, with even greater advantage, also be kept separate. If this were done, it could be financed partly from the main pool of those capitation fees (a seventh of his total) which the doctor foregoes when he opts for the fixed payments. But the doctor with the long list would no longer be able to complain that his capitation fee was being depressed for the benefit of colleagues unable or unwilling to care for so many patients.

A bad start has been made, but it has at least had the advantage of revealing possible causes of continuing dissatisfaction. These causes being revealed the cure should not be difficult to find. It is ver desirable that discussions should be successfull concluded in time to ensure that practitioners deriv due satisfaction from the cheques they will receive i the New Year.

News about Viruses

In the United States, where this summer has seen high though fairly localised incidence of poliomyeliti the disease is now receiving nearly as much publi attention as cancer. One result is that news experimental findings are appearing in the lay pre before publication in the scientific journals. Th tendency, however, is not confined to America or t poliomyelitis, as a peripatetic correspondent[1] late noted. No blame attaches to the research-workers, wh as a rule have merely read a preliminary paper o their subject to a learned society; and certainly not t the press, which is there to supply what its reade demand. If there must be a moral it is that scienti journals are apt to be more cautious than enterprisi in gathering news. The fact remains that we in th country first learnt of phenosulphazole, a sulpho amide active against viruses, from a press notice issu by Columbia University; and our first view of t poliomyelitis virus spreading up a peripheral ner was in the pages of *Time*.

The activity of some antibiotics and sulphonamid against the large viruses of the psittacosis-lymph granuloma group is now established, and there ha been hints and suggestions in recent publications the possibility of finding agents active against son of the main body of viruses outside that group. Th work on phenosulphazole, done by Dr. SubbaRo (who died in August) and his colleagues,[2] may provi the much-needed lead to guide us into this big fiel The new drug is the sodium salt of N-(2-thiazoly phenolsulphonamide; trade name 'Darvisul.' I was one of many compounds developed at the Cal and Lederle laboratories in 1947 and "showe promise," apparently against the virus of wester equine encephalomyelitis. During the last ye it has been tested against "poliomyelitis." Here word of caution is needed. The virus workers Columbia University do not agree with those in mo other laboratories as to the limits of the term "poli myelitis virus." SubbaRow, et al. have studied th Columbia-SK strain, which infects various roden and differs from orthodox poliomyelitis viruses in it high infectivity by the intraperitoneal route and i other ways. Most workers believe it is of cotto rat or mouse origin and not closely related to huma poliomyelitis though a member of the same broa family group. The protocols show a high rate o survival in infected mice injected with 4–8 mg. o phenosulphazole two or four times a day over fiv days. A survival-rate of 100% was obtained onl where the mortality in controls was well under 100% but in one group 17 out of 20 treated mice survived fo fourteen days where all of 20 controls died. Numerou recorded tests gave similar results. Surviving mice were subsequently immune to reinoculation. Such results were obtained when treatment was begun

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[1] See *Lancet*, Aug. 14, p. 259.

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[1] *Lancet*, Sept. 18, p. 472.

[2] Sanders, M., SubbaRow, Y., Alexander, R. O. . *To be published.*

additions to the auxiliary fund; and the report records a gift of £450,000 by Captain Oliver Bird for rheumatism and other medical research. In the trustees' introductory words is:

"The welcomed increase of State support for learning and research does not lessen the need for voluntary enterprise: neither does it decrease the importance of alternative sources of support if the principle—fundamental to a free and democratic society—is to be upheld that 'there should be room for more than one opinion and for more than one means of putting that opinion to the test.'"

MEDICAL FILMS

The three medical film meetings held on Oct. 8, 9, and 11 by the Scientific Film Association[1] in conjunction with the International Scientific Film Congress in London made it clear that too many recent productions are comparable to unrevised laboratory notebooks and not prepared lectures or articles. On Oct. 8 there was a reasonably good film from Australia showing neurological sequelæ of starvation; this was followed by a Danish one on the clinical examination of syphilitics; then by a Belgian film which was difficult to follow fully, and by an American film on the toxic effects of streptomycin which wasted time on introductory sequences and on demonstrating nystagmus which was not there. Dr. Margaret Fries's film on the psychological implications of observations of behaviour during a (pædiatric) clinic visit showed what a wonderful subject this is for a teaching film, but did not quite overcome the difficulties it presents. Mr. E. Gwynne [illegible]'s film on the behaviour of the orofacial musculature in children opened up new and more intelligent diagnostic and therapeutic approaches to the problems of "adenoidal" and mouth-breathing children. Two other films illustrating cases of chorea and Friedrich's ataxia, were approved for their brevity and directness; the omission of unnecessary introductory shots and distracting furnishings in the backgrounds, and because [illegible] everything in the commentary was illustrated in the films. The absence of choreic movements during sleep, a fact that clinicians have usually to take on trust, was well demonstrated, and the shots of the child after recovery gave the viewers an interest in her as a person as well as a case. This admirable new venture by the Wellcome Medical Museum should certainly be expanded.

Next day Mr. R. McV. Weston spoke on cinemicrography and showed four examples. The first was an excellent twenty-year-old Canti film of cells in tissue culture: the other films showed a progressive improvement culminating in the film of osteoclasts made by Mr. Weston in collaboration with Dr. Norman Hancox, of Liverpool University. The evident possibilities of this skilled technique should be exploited for larger audiences. Teachers of biology and physiology would welcome a fifteen-minute film on the behaviour of living cells in normal blood.

The lesson of the first day's meeting was that badly photographed and badly edited films cannot tell a story; but the moral to be drawn from the discussion on the second day was that good photographic technique is not enough. The American Medical Association centenary film, *The Medical Motion Picture*, was followed by a recently finished British film, *Subtotal Hysterectomy*, shown as a text for discussion. The lighting and colour were first-class, but the case was an unfortunate choice for the tumour was so large that it was difficult to see the other organs; only once was any detail of surgical technique shown, and possible difficulties were not emphasised. The criticism that this operation is or will be rarely done led to the expression of a widely held view—that the potential audience is too small to justify the making of postgraduate surgical films, in view of the urgent need for improving the teaching of students and nurses. The meeting ended with the film *Introduction to Acute Inflammation*, made by Dr. Beckett, Dr. Hansell, and Dr. Moller when they were students at the Westminster Hospital. This film uses diagrams, colour, and microscopy, and is a good instrument for teaching.

The last meeting opened with an American film on peptic ulcer, followed by a short cartoon film by Giles, *Cautionary Tales about Sepsis*. Mr. E. Fife Clark, public relations officer to the Ministry of Health, outlined past and present films from his ministry and discussed the part the film can play in health education. Miss Mavis Englefield of the Queen's Institute of District Nursing, introducing the U.S. Navy film, *Bathing the Bed Patient*, made a plea for simple nursing training films for mothers who like to look after their sick and would like to do it better. Dr. Stanford spoke on the value of short films, and several of these were shown—on the foramen ovale, a Dutch film on D.D.T. poisoning, an English film on the Aschheim-Zondek test, another showing a case of Sturge Weber syndrome (ending with the child sitting on Dr. Parkes Weber's knee), and one telling nurses how to put on a mask. Dr. Bloemensthal, of Holland, introduced a film he has made on the development of the peritoneum—an ideal subject for animation.

The meeting brought out once again the value of polished technique, to ensure that the audience's interest is in the content of the film,[2] and the importance of having a clear idea of what the film is to say and to what audience. It is good to hear that the S.F.A. are arranging that some, at least, of the films seen will be available in this country.

THE NAMES OF BACTERIA

The complexities of bacteriological classification can only be guessed at by the student who has to follow his textbooks, or by the clinician who must grasp the gist of laboratory reports; but the present multiplicity of authoritative nomenclatures is a trial for both of them. On one side of the Atlantic we have the radicalism of Bergey's Manual[3] (reviewed on p. 612), which has not hesitated to lay hands even on such an old enemy as *Staphylococcus aureus*; moreover its sixty contributors, like their predecessors, seem to have ignored much of the work done outside the American continent. On the other side the Medical Research Council follows a more conservative path in the new list of species[4] maintained in the National Collection of Type Cultures at Elstree, Herts. In general the List follows the familiar nomenclature of Topley and Wilson,[5] so that *Salmonella typhi* has not suffered a sea change, à la Bergey, into *S. typhosa*.

On points of detail, medical bacteriologists may express surprise and regret that neither publication recognises the species *Bacillus mesentericus* and *B. vulgatus*: in the past the name mesentericus has been given to different organisms, but most strains are now regarded as either *B. pumilus* or *B. subtilis*. *B. anthracis* retains its identity in spite of Nathan Smith's[6] view that it is a pathogenic variety of *B. cereus*. Synonymy is common in the genus Clostridium: the List prefers *welchii* to the Manual's *perfringens*, though neither is valid if the Bacteriological Code is strictly followed. Bacterium is used in the Manual as the generic name for gram-positive and gram-negative non-sporing rods of uncertain taxonomic position; in the List it is used in italics for coliforms (*Escherichia* and *Aerobacter* of the Manual) and related intestinal organisms, and in roman type patients and 48% of the patients maintained on desoxycorticosterone acetate had a lymphocytosis; but the "average" figures given for these groups show that the 40% level has only just been exceeded and most of the counts would hardly be regarded as abnormal. Others have had similarly unconvincing results.

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[1] Programme and detailed list of films can be obtained from the Association at 34, Soho Square, London, W.1.

2. Izod, A. C. Place of the Film in Medical Education. London, 1946; p. 12.
3. Breed, R. S., Murray, E. G. D., Hitchens, A. P. Bergey's Manual of Determinative Bacteriology. Baltimore, 1948.
4. List of Species Maintained in the National Collection of Type Cultures. *Med. Res. Coun. Memo.* no. 21. London: H.M. Stationery Office. 1948. Pp. 17. 9d.
5. Topley and Wilson's Principles of Bacteriology and Immunity. Revised by G. S. Wilson and A. A. Miles. London, 1946.
6. Smith, N. R., Gordon, R. E., Clark, F. E. U.S. Dept. Agric. Misc. Publ. no. 559. Washington, 1946.

The severest criticism has fallen on that part of the theory which connects the dissolution of lymphocytes with the release of globulin antibodies. Li and Reinhardt[5] gave adrenocorticotrophin to rats and found that the plasma globulin actually decreased, but the albumin increased; Gjessing and Chanutin[6] report similar findings; Houghton et al.,[7] using cats and rabbits, were also unable to confirm Dougherty and White's findings. Again, it has been noted that increased serum globulin is not found in human diseases associated with lymphatic hyperplasia; Nitske and Cohen,[8] for example, found no significant alteration in serum proteins in 12 patients with lymphatic leukæmia. Fagraeus[9] denies that lymphocytes have anything to do with antibody formation and points out that the changes in lymphocytes brought about by adrenocortical hormones occur in le
12 hours, whereas most antibody formatio
place 48 hours after appropriate stimulation.
plasma cells, she says, that are important for a
formation, and there is good evidence no
plasma cells are derived directly from r
endothelium and are not modified lympl
Fagraeus carried out *in-vitro* experimen
isolated fragments of rabbit spleen; she fou
there was always more antibody in red pulp
white pulp containing splenic follicles (mal
bodies), and that the capacity of the red pulp
antibodies varied with the number of plasm
especially immature types that were present

The idea that the dissolution of lymphocytes
by adrenal cortical hormones is concerne
globulin production in general and antibody
in particular must therefore be regarded as
proven." This is a pity because we have s
firm information on the function of the lymp
But such contradictions should remind us to
mind the possible fallacy of assuming that
brought about by artificial and considerable
of hormone concentrations represent the
mechanism of control; we are in fact faced w
old difficulty of deciding whether observed
are physiological or toxicological.

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[5] Li, C. H., Reinhardt, W. V. *J. biol. Chem.* 1947, **167**, 487.
[6] Gjessing, E. C., Chanutin, A. *Ibid*, **169**, 657.
[7] Houghton, J. S., Thatcher, J. S., Hiles, C. *J. Lab. clin. Med.* 1947, **32**, 1410.
[8] Nitske, B. A., Cohen, P. P. *Blood*, 1947, **2**, 363.
[9] Fagraeus, A. *Acta med. scand.* 1948, **130**, suppl. 204.

Annotations

MEDICAL RESEARCH COUNCIL

Viscount Addison, M.D., has joined the Medical Research Council as chairman in succession to Lord Balfour of Burleigh. Others whose appointments to the council were announced this week are: Sir George Schuster, who succeeds Sir William Goodenough as treasurer; Sir Frederic Bartlett, F.R.S., professor of experimental psychology in the University of Cambridge; Sir Howard Florey, M.D., F.R.S., professor of pathology in the University of Oxford; and Mr. Geoffrey Jefferson, F.R.C.S., F.R.S., professor of neurosurgery in the University of Manchester. The other members of the council are: Group-Captain C. A. B. Wilcock, M.P., Prof. P. A. Buxton, M.R.C.S., F.R.S., Prof. Sir Alexander Fleming, F.R.C.P., F.R.S., Prof. C. A. Lovatt Evans, F.R.C.P., F.R.S., Prof. R. A. Peters, M.D., F.R.S., Prof. J. H. Gaddum, M.R.C.S., F.R.S., Prof. H. P. Himsworth, F.R.C.P., and Sir Edward Mellanby, F.R.C.P., F.R.S. (secretary).

NUFFIELD FOUNDATION

Two of the objects of the Nuffield Foundation are well known to doctors. These are "the advancement of health" and "the care and comfort of the aged poor." *But there is a further aim—namely, "the advancement* of social well-being"; and under this broad canopy the third report[1] records new grants for work on such widely differing topics as agricultural policy and the development of the reflecting microscope. In the field of the social sciences support is promised for a study of group relations and an investigation into the social factors of town-planning.

> "Town-planning in the past," the report observes, "has taken account of sanitary needs, natural features, and æsthetic considerations, and has reached the concept of the 'master plan'; but *knowledge of the social and economic* trends which should provide the real basis for continued planned development consists mainly in wisdom acquired after the event."

The foundation is also supporting a study of the
classes, with special reference to their recruitm
intricate system of which little is known. Recruit
another sort is to be examined by Prof. Aubre
at London University's Institute of Psychiatry. P
Lewis is undertaking a long-term study of un
candidates—accepted and rejected—with the
determining: (1) to what extent the existi
familiar practice of selection agrees with the re
psychological procedures; (2) whether, in those ac
academic or psychological assessment agrees bett
the students' examination results and later perfor
and (3) what happens to those rejected, and how f
subsequent success or failure could have been pr
from the results of the psychological tests.

Medical research is being aided by two new
One is for the establishment of a hæmatological
Oxford, and the other is for a survey of the hea
development of children born in one week of Marc
who at that time were observed in a study of ma
services organised by a joint committee of the
College of Obstetricians and Gynæcologists, the I
tion Investigation Committee, and the Institute o
Health of London University. One of the most v
functions which the foundation has undertaken
encouragement, by fellowships and other awards,
exchange of students, both senior and junior, wit
Empire. The Dominion medical travelling fellowsh
to be continued, with slight modifications, for a
seven years; and within the Dominions committ
to be set up to advise on local requirements. The f
tion has also been instrumental *in procuring,* for doc
outlying parts of the African colonies, the stim
periodic visits by consultants from Britain.[2]

The major part of the obligation to the welfare
old is now discharged through the *National Corp*
for the Care of Old People, established last year
with the Lord Mayor of London's Air Raid Distress
For income the foundation relies mainly on the
fund of £10 million presented by Lord Nuffield,
the scope of its work grows it can put to good u

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[1] Report of the Trustees for the Year ending March 31, 1948 Issued from the foundation's offices, 12–13, Mecklenburgh Square, London, W.C.1.

[2] See *Lancet*, 1948, i, 431.

Special Articles

CONDITION OF CHILDREN IN WESTERN GERMANY

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LITTLE has been published on medical conditions in -war Germany. Newspaper reports have been scanty often conflicting. Consequently it has been difficult anyone outside the country to get a clear impression the state of health of the people. Particularly, a great l of doubt and anxiety must exist about the health the children. This paper, based on observations made ing two recent visits to Germany,* has been written the hope that it may help to relieve such uncertainties. is does not claim to be a precise scientific study but ely sets forth the observations and conclusions of person who has recently seen and examined many man children.

Whenever health in Germany is discussed, it has me usual to think first of nutrition. It is therefore ll to begin with a short account of the population and origin of its food.

The present total population of the combined British-S. zones, excluding Berlin, is about 41,300,000. The ulation of the French zone is about 5,000,000. Of population in the British-U.S. zones 80% are "non-suppliers" and therefore depend on the rations. Of e, about 9,000,000 are children up to the age of 18. re are about 1,000,000 children up to the age of 18 the French zone.

fore the war the area now comprising the British U.S. zones produced about two-thirds of the food to provide its whole population with an average calories per head daily. But then the population ly 34,000,000. Now there are 7,250,000 more to be fed (mainly refugees from the east). Con-ly more than half the food for this population imported, even though they eat less.

1939 the crop of bread grains in the combined ish-U.S. zones was about 5,700,000 tons. By 1946 had fallen to 3,450,000 tons, mainly through lack of ilizers. The potato crop was about 17,500,000 tons re the war but had decreased by 6,000,000 tons in 6. Further, before the war about 1,000,000 tons of d grains, 1,000,000 tons of potatoes, and 400,000 of sugar used to come from the east—and this no er comes. All this explains why it was necessary import about 4,000,000 tons of bread grains into the ish-U.S. zones in 1947. The actual deliveries from man farms to the market in the year ending June 30, 7, was 2,250,000 tons. Hence in 1946 and 1947 about thirds of the bread ration in the British-U.S. zones from imported grains. About the same proportion bread grains is imported into the French zone.

THE CHILDREN'S RATIONS

On the whole the children have received a generous re of the tremendous amount of food imported into zones. When supplies have been short, it has usually been the policy to meet the children's rations and workers' supplements first out of available stocks; whatever then remains has been distributed on the basic adult ration to the "normal consumers," of whom there are about 10,000,000 in British-U.S. zones who receive no additional supplementary rations of any kind.

The foodstuffs actually provided as rations to children in British-U.S. zones in May, 1948, are shown in the accompanying table. These rations have undergone very little change in the past two years. It will be noted that though these rations provide extremely little meat and fat they at least provide a good amount of milk for the younger children.

Milk.—Supplies have fallen off by about 30% since 1939–43. This is mainly because the German cow is producing very much less milk through lack of imported cattle-feed and because of the poor fodder crop of 1947. It is greatly to the credit of those responsible for the organisation of food distribution in Germany that the limited supplies of milk available have been successfully applied to the needs of young children. Inevitably, however, the older children have received less than their needs. Another unfortunate circumstance is that bad transport and cooling facilities lead to the distribution of much half-sour milk, especially in summer. In some places this undoubtedly contributes to the infant mortality.

Food in Addition to the Rations.—From the table it will be seen that, though the caloric value of the ration for children under the age of 3 years is adequate for their needs, above this age the ration becomes increasingly insufficient to meet energy requirements. For the older children especially, their health and nutritional state depend vitally on food obtained in addition to the rations. The sources of such additional food are as follows:

OFFICIAL MONTHLY RATION ALLOWANCES FOR CHILDREN IN COMBINED BRITISH-U.S. ZONES, MAY, 1948

Commodities (g.)	Age-groups (years)			
	Under 1	1–3	3–6	6–20
Bread	2200	3250	6600	11,000
Cereal products	2175	1500	1250	1100
Potatoes	4500	4500	9000	9000
Fat	375	330	330	330
Sugar..	1375	1000	1000	1500
Meat	—	100	100	100
Cheese	—	—	62	62
Milk (skimmed)	—	—	—	6000
Milk (full)	22,500	22,500	15,000	—
Fish	—	—	600	600
Eggs (number)	5	5	5	5
Dried fruit	—	500	500	1000
Calories per head daily ..	1205	1202	1443	1695

School Feeding.—A school-feeding programme was begun first in the British zone and extended, in 1947, to the U.S. zone, following the recommendations of Mr. Herbert Hoover. In May, 1948, about 5,000,000 school-children in the two zones were receiving a snack of about 300 calories in school, on average five days a week. This snack generally consisted of a sweet "soup" of cereal and milk powder, or sometimes a salted soup containing meat extract and some fat, often served with a bread roll. The distribution is planned to cover the neediest children and is very well organised. It is universally appreciated by teachers, parents, and the children. In the French zone no similar programme is at present in operation, chiefly owing to shortage of supplies.

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* I visited Germany in October, 1947, as a British representative on the Combined United States, British, and French Nutrition Committee, and again in May, 1948, as a member of a mission sent by the United Nations International Children's Emergency Fund, to investigate the condition of children in the three western zones of Germany. The views and conclusions expressed here are purely personal and do not necessarily reflect the official views of either of these bodies. The account of the food-supplies is based on conditions existing in May, 1948. I understand that the situation has considerably improved since then; the basic adult ration has been increased and more food is appearing on the open market as a result of the currency reform.

as a dump-heap for gram-negative rods that cannot be placed elsewhere. In neither case is the use of this generic term intended to be part of a systematic classification. There is an undesirable tendency, in both the Manual and the List, to put too much stress on the source of the organisms in determining their taxonomic position. This is an unhappy result of the division of bacteriology into watertight compartments—for example that of the medical worker who knows nothing of plant pathogens, and that of the plant pathologist unfamiliar with the bacteriological flora of polluted water.

The staphylococci are still to be found under the letter S in the List (instead of under *M* as in Bergey), but the List has adopted a new, and so far unexplained, classification for them. Ten years ago, Dr. Cowan,[7] who is curator of the National Collection, published a scheme in which coagulase production (which correlates well with toxigenicity) was used as the main criterion for the species *pyogenes*, and, as was to be expected, this is adopted in the List. Pigment is given taxonomic value only in the coagulase-negative strains; the specific name *aurantiacus* is used for the gold colony form to avoid confusion with the well-known *aureus*, now included in the species *pyogenes*.

An attempt is made in the Manual to include bacteriophages and viruses in a systematic classification of bacteria. Phagus, the generic name used for bacteriophage, is easily recognised, but *Tarpeia premens* (common cold), *Erro scoticus* (louping-ill), *Hostis pecoris* (foot-and-mouth disease), *Scelus recurrens* (herpes simplex), and *Borreliota variolæ* (smallpox) are not likely to be found in English writings for some time to come. British workers are not yet attempting to classify the viruses, since little or nothing is known of their "systematics."

AUREOMYCIN

PENICILLIN and streptomycin, effective as they are in many infections, still leave gaps in the antibacterial spectrum; so the search for new antibiotics goes on. A new one, described by B. M. Duggar of Lederle Laboratories, is aureomycin, derived from a strain of *Streptomyces aureofaciens* and effective against numerous gram-positive and gram-negative organisms, including streptococci of Lancefield groups A, D, F, and G, *Strep. fæcalis*, *Bact. pneumoniæ*, *Streptococcus pneumoniæ* types I, II, and III, *Hæmophilus influenzæ*, and *Brucella suis* and *abortus*. The antibiotic has been obtained as a yellow crystalline hydrochloride which deteriorates rapidly in alkaline solution at room temperature. The "acute toxicity" of aureomycin when injected subcutaneously into mice is between 3000 and 4000 mg. per kg.; daily doses of 60 mg. per kg. by mouth and of 3 mg. per kg. parenterally are well tolerated in man. It is excreted in large quantities in the urine but does not penetrate the blood-brain barrier.

Aureomycin is as effective as penicillin in protecting mice against *Strep. pneumoniæ* type I but is inferior to penicillin against β-hæmolytic streptococcal infections. Clinical trials have been carried out by Prof. Perrin H. Long and his colleagues[8] at Johns Hopkins Hospital, Baltimore. The dosage given by mouth varied from 10 to 60 mg. per kg. of body-weight per day, in divided doses. Intramuscularly a total daily dosage of 3 mg. per kg., given six-hourly, was well tolerated, though there were signs of moderate irritation at the site of injection. Five patients with Rocky Mountain spotted fever seemed to respond to aureomycin in twelve to seventy-two hours, and a patient with chronic brucellosis had a negative blood-culture forty-eight hours after the start of treatment and remained afebrile and asymptomatic for the next two months. The antibiotic sterilised the urine of two patients with a paracolon infection. These numbers are very small and need extending f critical appraisal. There is no question of aureomyc being another penicillin, but if the claims made for are confirmed it should prove useful, particularly f the control of brucellosis and urinary-tract infections.

HOSPITAL ADMISSIONS IN THE NEW SERVICE

SOME idea of the effects of nationalisation on hospit admissions in London can be gained from the experien of the Emergency Bed Service, which is still worked the King's Fund though now on behalf of the fo Metropolitan regional boards. The work of the E.B has been extended by the addition of fever-hospit admissions, responsibility for which was taken ov from the L.C.C. on July 5. These, however, do n account for the 400% rise in the number of calls receiv The rise has been mainly due to a great increase in acu cases. There have been many applications for t admission of chronic cases, though not the deluge th might have occurred: doctors evidently realised that new service could not produce beds overnight. T total number of calls received in the first three mont of the service was 10,974 (acute 8132; fevers 284 and some 500 chronic cases were passed through service to the hospital management committees' waiti lists.

The use of the E.B.S. by doctors is *optional*—th are in no way barred from arranging admissions dir with the hospitals—so this sudden increase is not ea to explain. One possible explanation, and a disturbing o is that doctors are finding it more difficult to patients into hospital and so are calling on the E.B for help in a larger proportion of cases. This vi is supported by the difficulty which the E.B.S. is its experiencing in placing patients. All the fever ca have been admitted and virtually all the acute cas in spite of a quarter of them being over 60 years of a The fever admissions have been fairly simple, requir an average of only 1·5 calls per case. On the ot hand, for every acute case admitted an average o hospitals had to be asked, as against 2·7 for corresponding period last year and 1·6 in 1939. T figure was reached in the healthy month of Septemb and the E.B.S. has so far borne the strain, albeit wi more delays than heretofore; but the winter mont will evidently tax its resources to the utmost. Mea while steps are being taken to establish branch admissi offices outside Greater London. As far as possible th will be run by the existing staff of the hospital mana ment committees, who are being given a short cou at the E.B.S. office in London. The intention is establish centres throughout the Metropolitan regio so that doctors can be sure of obtaining a bed for th patient if there is a vacancy anywhere in his region.

HOUSE COMMITTEES

THE position of house committees was one of t subjects considered on Oct. 6 when the Minister Health met chairmen of boards of governors, regional boards, and of hospital management committe Among the points made were some that have late been raised in these columns,[1] such as the recru ment of management committees from members of t house committees who have shown their worth, and t need for heads of departments to be given their rightf position of responsibility. We understand that it was al suggested that house committees would gain a wid outlook if some of their members actively participate in the work of the management committees. No dou arrangements will vary with circumstances, and the may be places where, instead of appointing a hous committee, it would suffice to appoint house visitor who would keep the management committee in clos touch with its several hospitals.

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[7] Cowan, S. T. *J. Path. Bact.* 1938, 46, 31.

[8] Bryer, M. S., Schoenbach, E. B., Chandler, C. A., Bliss, E. A., Long, P. H. *J. Amer. med. Ass.* 1948, 138, 117.

[1] *Lancet*, 1948, i. 643; Oct. 2, p. 535

Very extensive data are available on the average heights and weights of school-children in the three zones during the post-war period. In the U.S. zone 1,850,000 school-children were measured in March, 1948, and comparable data are available from December, 1946, and January, 1948. In the British zone monthly measurements of over 10,000 children have been carried out since December, 1946. In the French zone heights and weights of about 370,000 children have been recorded quarterly. These data show some apparent general improvement in both average height and weight over the past year among children in the British and French zones, and some slight improvement in weight, without much change in height, in the U.S. zone. Children in the U.S. zone are, on average, somewhat taller and heavier than in the British zone, possibly owing to hereditary differences.

It is much to be hoped that this large accumulation of data will ultimately be analysed by some competent authority and published with proper interpretations. For the present, however, it seems dangerous to attempt any interpretation without careful analysis, particularly to attempt any *comparison with* various standard "norms" for heights and weights at different ages. It would be necessary to take into account the age at which German children should normally reach puberty, with its pronounced effect on the pattern of growth. Moreover, it is no simple matter to decide what the present average stature of an adequately nourished German child should be at any particular age, bearing in mind the general tendency of Europeans to grow with increasing rapidity during the present century. Rather than attempt any immediate conclusions from these anthropometric data, it seems wiser to rely on the clinical appearance of the children as they are there to be seen.

CLINICAL OBSERVATIONS

About 1600 children in the three zones were personally examined by me in October, 1947, and about 1500 in May, 1948. The towns visited, the approximate number of children examined, and the kind of institutions in which they were seen were as follows:

October, 1947

British zone: Hamburg, Hanover, Essen, Düsseldorf. [illegible] children in 3 schools, a kindergarten, a factory (apprentices), and a nutrition-survey clinic.

U.S. zone: Stuttgart, Nuremberg, Frankfurt. 400 children in 5 schools and a nutrition-survey clinic.

French zone: Trier, Ludwigshafen, Freiburg. 800 children in 6 schools, an orphanage, a gymnasium, and 3 factories (apprentices).

May, 1948

U.S. zone: Wiesbaden, Kastel, Aschaffenburg, Mannheim, Heidelberg. 700 children in 4 schools, 2 kindergartens, a hospital, and 2 nutrition-survey clinics.

British zone: Bonn, Duisburg, Haagen, Dortmund, Düsseldorf. 600 children in 4 schools, 2 kindergartens, 2 orphanages, and a hospital.

French zone: Mainz. 200 children in a school and an orphanage.

This clinical study was deliberately limited to the larger towns, most of which are partly destroyed, because the available evidence goes to show that the serious nutritional problems are practically confined to such towns. Information on food-supplies, vital statistics, the opinion of military-government officers and of German public-health officials, and personal observation during many journeys through the country make it virtually certain that there are no nutritional problems among the "self-suppliers" and "part-self-suppliers" who live in the country and comprise about a quarter of the present population of the British-U.S. zones.

It is reasonably certain that the children here described include a good proportion of those in the worst condition to be found in each of the three zones. In many instances the children for examination were selected by German officials. Inquiry was often made into the basis of this selection, and, on the whole, satisfactory assurances were obtained that a representative sample of children was seen in each locality.

Evidence of Underfeeding (Caloric Deficiency)

Most of the school-children present the appearance of normal health and, undressed, seem in fairly good condition though occasionally hollow-eyed or a little thin, and sometimes with protuberant abdomen, stooped shoulders, and prominent shoulder blades. The girls generally appear in better condition than the boys, and children aged 12–14 better than those 6–8 years. The best-nourished fall into the category of averagely nourished children.

In the British zone, where school meals have been in operation for two years, the distinct impression was gained that the general average of nutrition was more uniform than in the U.S. zone. In the French zone the difference between the best and worst children seemed more pronounced than in the other two zones.

Though the physical appearance of the majority was fairly satisfactory in every school visited, a minority, amounting generally to about 10% but in one school (Kostheim, U.S. zone) involving about a third of the children, were clearly undernourished. The common appearance of these children was that of being undersized, listless, flabby, pot-bellied, and pale. Direct questioning of children presenting this appearance almost always showed that they came from one of the following "vulnerable groups":

(1) Refugees.
(2) Families where the father was absent or dead.
(3) Families who had lost their possessions by bombing.
(4) Large families.
(5) Families with sick parents.
(6) "Problem" families in the social-work sense.

Most of these receive few of the indirect benefits enjoyed by children of established industrial workers, who receive extra workers' rations and part payment in factory products. The condition of children from these vulnerable groups is not revealed in the general statistics, by reason of the better condition of the great majority of school-children.

Pre-school children mostly appeared adequately nourished, only a few being unduly thin.

Adolescents aged 14–18, as seen in secondary schools, were generally in better condition than younger children, probably at least partly for the reason that they came from families in better economic circumstances. In industrial schools, on the other hand, where the lower-income groups were mostly found, there was considerable variation in height, weight, and general condition, and in this group individual cases of definite chronic undernutrition were evident.

Psychological Effects of Underfeeding

Personal impressions were heard from doctors, teachers, and military-government officials about the present psychological reactions of school-children. A common opinion was that, though initial attention in schools was good, children seemed to have difficulty in memorising facts. Many seemed unable to stay awake or to pay attention for the whole period. Emotional instability, especially among older children, was mentioned more than once. Such troubles were said to have notably diminished since school feeding has been established. It is difficult to evaluate these impressions objectively, but nevertheless they are an indication of psychological damage resulting from many adverse environmental factors, including underfeeding.

Deficiencies of Specific Nutrients

Vitamin D.—There is a significant incidence of rickets among infants in the cities. Possibly 1 in every

Relief by Voluntary Agencies.—In May, 1948, voluntary agencies were feeding about 220,000 children, mainly under school age, in the British-U.S. zones. In most cases, however, such supplements have been distributed for a few weeks at most to a given group of children and then diverted to another group, to "spread" a limited number of rations as widely as possible. In a similar manner about 10,000 children in the French zone were receiving in rotation a small number of rations that probably did not exceed 3000 rations on any one day. In addition a considerable number of parcels sent by private persons abroad have been coming into Germany. It is impossible to obtain an over-all estimate of their numbers and the amount of food they contain.

Extra Rations for the Ill and Underweight.—The rationing system in all three zones provides for supplementary rations on medical certification to sick patients and those more than 20% underweight. In the British-U.S. zones the "underweight" ration is for 645 calories daily. The number of persons receiving such supplements varies very much from one locality to another, depending probably on the readiness of local doctors to grant certificates. In the Ruhr district, for instance, the number of the population receiving these supplements is 10% in some towns and over 20% in others where health conditions are apparently no different. These extra rations probably go more often to adults than to children. Direct personal inquiry in various schools generally revealed that the few children who were receiving the "underweight" ration were obviously in need of it. Very often there were others who also appeared in need of extra feeding but had not been certified for it.

Unrationed Food.—In the small towns and villages allotments and gardens are unquestionably of considerable assistance, particularly in the summer and autumn; but in the large bombed cities the number of privately cultivated plots is so few that it is doubtful whether they make any significant difference to the total food-supplies of the people in these cities.

Black Market.—The real extent of the black market is a favourite subject for speculation. It is obviously operated erratically and most unevenly through the population. There is certainly a small group of shrewd and successful traders in black-market food and still a few people with non-essential household property to barter, but most of the working population have no such advantages.

Certain factories have been paying their workers partly in kind, anything from clocks to slide-rules, but it takes time and trouble to trade these for food. More usually the trading is a simple exchange of labour for food. The five-day working week allows the worker to spend one day a week in the country working for a farmer for the price of a good meal and perhaps a few pounds of potatoes and vegetables; but in the neighbourhood of the large cities the price of such labour is cheap and the reward correspondingly small.

For these reasons any estimate of the average number of calories received from black-market sources per head of the urban population must be interpreted cautiously. It is liable to give an erroneous impression of a smooth and efficient distribution, benefiting all classes equally.

German authorities quote a figure between 200 and 300 calories as the average per-caput daily consumption of black-market food. Comparison between the official rations and the actual state of nutritional health of the people might suggest a figure nearer 500 calories, but whatever the true figure it probably declined in the first half of the year with the exhaustion of illegal holdings of potatoes. As one German professor put it, the only generalisation that one can make about the black market is that the most dishonest fare best.

Share in Parents' Rations.—Everywhere in Germany one hears the story that parents, especially mothers, give part of their rations to the children. Since workers and heavy workers receive substantial additions to the basic adult ration, their children particularly are likely to benefit. This frustrates the purpose for which the extra rations are granted —to increase industrial production.

The official rations do not provide sufficient calories for children, except those under the age of 3 years. Every child must therefore receive some additional food from one or more of the sources mentioned above. The diversity of these sources makes it impossible to estimate accurately the average food intake of German children either in terms of calories or of specific nutrients. The best clue to their state of nutrition must come fro the medical evidence.

RELEVANT VITAL STATISTICS

Infant Mortality

Official notifications of infantile deaths in the thi western zones have been as follows:

		Deaths in the first y per 1000 live birth
1938	All Germany (1937 boundaries)	59·8
1946	U.S. zone	95·1
	British zone	107·0
	French zone	88·8
1947	U.S. zone	84·8
	British zone	81·0
	French zone	89·0

Though the general tendency, at least in the U.S. a British zones, is towards a reduction in infantile m-tality, the rates are still more than a third above pre- levels. This is mainly because of the continued h mortality in some of the large bombed cities; instance, in Mannheim and Ulm (U.S. zone) and in so of the Ruhr towns (British zone) rates of over 100 w recorded for 1947.

Tuberculosis

No separate figures are available to indicate the i dence of tuberculosis among children, but the statist covering all age-groups may be taken as an index the general trend. The mortality from all forms tuberculosis has been as follows:

		Deaths per 100,00 population
1938	All Germany	62
1946	U.S. zone	57
	British zone	63
	French zone	65
1947	U.S. zone	55
	British zone	64
	French zone	65

In contrast to the mortality figures, the notifications new cases are considerably above the pre-war figures a continue to rise. However, as explained elsewher there is reason to think that this is largely a pa increase.

Several professors of pædiatrics, with whom conven tions were held, thought that they were seeing rat more cases of tuberculosis in their hospital practices th formerly. It is therefore possible that there is so increase in new cases of tuberculosis among childr though not to the extent that recent tubercul notifications seem to indicate.

German public-health officers often emphasise th adult forms of tuberculosis are now commonly se among children, but it is difficult to find any defin factual basis for this contention.

Other Infections

The incidence of other notifiable infectious diseases not remarkable and is similar to what might be expect in any European industrialised community. One no notifiable condition that now seems to be particular common among children in some urban areas is infest tion by worms, chiefly oxyuris, but ascaris also is sa to be prevalent.

ANTHROPOMETRIC DATA

Any important incidence of underfeeding (simp calorie deficiency) would be expected to lead to retarde growth, which should be reflected in the statistics fo heights and weights of children.

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1. Tuberculosis in the British Zone of Germany, with a Section o Berlin. Report of an Inquiry made in September-October 1947. H.M. Stationery Office. 1948.

seems to have been made in the supply of city s. Often the only notable building activity is re-roofing of a church or the repair of an ancient ment.

.—Domestic fuel has been short everywhere since woodwork torn from bombed buildings was used up. nter the poor have had to make the most of their fuel by heating one room, crowding into it, and not lating it lest the heat escape.

hing.—German children still living in their own es were comparatively very well clothed at the end e war. At least a fourth of the population, however, bombed out at least once and lost much of their ing. In addition, a sixth of the present population British-U.S. zones came in as refugees, usually with the possessions they could carry. As a result nearly of the population are in definite need of clothing. the rest are rapidly running out of shoe-leather garments made of cotton. A small but important r has been the extreme shortage of sewing-thread, commands fantastic prices in the black market.

p.—The current soap ration provides every person month with a tablet of soap about a fourth the size ordinary cake of toilet soap, just enough to wash ld all over with soap once a week. Some families extra soap in parcels from abroad or as part of the r's wages if he works in the right factory. In addi- , a small amount of detergents is available for the ing of clothes. Few homes can provide any hot r for washing. In the circumstances, especially in midst of all the dust and dirt that surround everyone bombed city, it is amazing to see how clean the ren are kept. Relatively few city children are dirty, pt for their bare feet.

d.—Whatever may be said about the nutritive value present diet, it is certainly extremely monotonous. average German child is fairly happy with a diet of and potatoes, provided there is some fat and a meat to go with it. But the perpetual bread and aked vegetables of the present diet, even though to the healthy child, are certainly not stimulating child with a fickle appetite.

life has been generally disorganised. At least people in the cities in Western Germany have move from their normal homes, either because of ing or because they are refugees. They are living relations or have strangers billeted on them. dreds of thousands are still living in the basements their wrecked homes. Since work must be found ever factories are standing, the breadwinners are forced to live away from home. As in many other tries, families were split up during the war, and the s of separation have been prolonged for the German es in which the fathers have been held as prisoners- ar. An astonishing number of children still say that fathers "have not come home from the war."

Black Market.—Most of the children are exposed every to constant discussions within the family about how rrow's inadequate rations can be increased through lack market. Every member of the family must do t is necessary, and it is said that many well-brought- children have been stealing food to help their families.

Schools.—Almost all the school buildings are dirty, damp, and often partly destroyed. Two or even separate schools use the same class-rooms, working shifts so that school hours are shorter than normal. er, books, and writing materials are still extremely rce. The teachers are shabby and underpaid; they tired and are often dispirited. Too many of them elderly. One gathers the impression that, to maintain ipline in large classes (which sometimes contain up 75 pupils), they rely too much on the system of stern ders and immediate obedience—the system under ich they themselves grew up. Though much effort has been expended by the occupying authorities to revive in the universities true scholarship, which the Nazis suppressed, this is necessarily a long-term project from which, as yet, the city children show little signs of benefiting.

Isolation.—The older children especially seem to share with their parents the feeling of isolation from the outside world and indifference to events taking place in it. Distribution of newsprint is limited, wireless sets are often worn out, and there are almost no posters except those chalked on walls by political propagandists. The former intellectual isolation of Germany, so well described by Thomas Mann,[2] is doubly intensified now and, for the moment, the people seem emotionally exhausted.

DISCUSSION

Life in the bombed German cities has been both physically disagreeable and psychologically disheartening during the past three years. The reaction of the people to their consequent misery has been to focus their complaints on the one thing that they see clearly—the obvious inadequacy of the official rations. Perhaps partly because of this constant insistence on food, a tremendous effort has been made by the occupying authorities to keep the people fed by means of imports; in fact, about two-thirds of the bread distributed in Western Germany during the past two years has been made from imported grain. As a result, the children have been saved from starvation and even from serious underfeeding and malnutrition. But no similar effort has been concentrated on the other influences that make life in the bombed cities miserable: gross overcrowding, lack of warmth, worn-out clothing, lack of washing facilities, disrupted home life, the immoral pressure of the black market, and, perhaps most important for the future, the lack of proper education.

The overwhelming impression of a physician visiting Germany is the dangerous social and psychological environment in which the children of the bombed cities are growing up. By comparison with this, their nutritional health is now a minor issue.

SUMMARY

A brief account is given of the child population of Western Germany and the sources of its food.

The relevant vital statistics are considered.

Observations are presented based on the personal examination of over 3000 children seen on two recent visits to Germany.

It is concluded that, though the general level of health and nutrition among the great majority of children in bombed cities is relatively satisfactory, there is a minority, comprising the "vulnerable groups," whose physical condition is poor.

It is emphasised that, by comparison with their nutritional health, the social and psychological condition of the children is likely to be a much more serious issue.

Grateful acknowledgment is made to the numerous officials of the occupying governments, German public-health officials, doctors, teachers, parents, and children who supplied the information that provides the background of this paper.

In particular I wish to thank the following senior officers for their very great assistance on both visits to Germany: Colonel Milford T. Kubin, public-health branch, O.M.G. (U.S.), Brigadier W. Strelley Martin, M.C., chief, public-health branch, C.C.G. (British), and Médecin Général G. Coulon, directeur de la santé publique, G.M. de la zone Française.

I also wish to thank my colleagues on the UNICEF Mission: Mr. S. M. Keeny, recently chief of the UNRRA Mission to Italy, and Dr. C. E. Raiha, deputy chief, University Pædiatric Clinic, Helsinki, Finland. I have drawn freely on their ideas and observations, but they do not necessarily agree with the interpretations given in this paper.

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[2] Mann, T. *Yale Rev.* 1946, 35, 223.

10 infants on average would show three or more of the clinical signs of rickets. In some places the incidence is certainly higher; for instance, in Mannheim (U.S. zone) the infants of a random sample of the population, seen by me, were in particularly poor condition; almost all had rickets, and some were marasmic. This city has an unusually high infant mortality, which is probably due to two causes: the disorganisation of its milk-supply, and the large number of families still living in the basements of wrecked houses. Synthetic vitamin D ('Vigantol') is manufactured in Germany, but its distribution for the prevention of rickets is not always satisfactory.

Vitamin A.—There is a theoretical possibility that vitamin-A deficiency might arise through a lack of sufficient fat in the diet to facilitate the absorption of carotene. However, there appears to be no objective evidence of such deficiency among the children. Slight degrees of follicular hyperkeratosis are fairly frequent, as in British children, but it is reasonably certain that vitamin-A deficiency is not the only cause of this condition. No complaints were made of poor night-vision (hemeralopia) among children.

Vitamin-B Complex.—There is no clinical evidence of deficiency of any component of the vitamin-B complex, except possibly riboflavine. This is scarcely surprising in view of the good amounts of the complex that must be provided by the high-extraction cereals now commonly consumed. An occasional case of very mild angular stomatitis may be encountered, doubtfully due to riboflavine deficiency.

Vitamin C.—Among the children examined in October, 1947, the incidence of gingivitis was rare. A quite different impression was gained in May, 1948; in some localities inflamed gums seemed to be unusually common among the children; further, out of 1500 children seen 3 cases were discovered in which the gums present the swollen livid hæmorrhagic appearance of clinical scurvy. In several other cases the gums were unusually swollen though no longer acutely inflamed, suggesting partial healing of scorbutic changes. By May, 1948, when the second survey was made, some green vegetables had already been distributed in most localities. The impression was gained that, had the survey been conducted a month earlier, more scorbutic gingivitis would have been seen.

Fruit and green vegetables were extremely scarce in the large cities during the past winter; moreover, the partial failure of last year's potato crop was a further limitation to the supply of vitamin C. It is difficult to avoid the conclusion that there has been a significant incidence of vitamin-C deficiency among children during the spring of this year.

Protein.—Famine œdema has been a popular clinical diagnosis in Germany during the post-war period, as is usually the case in a country short of food and under military occupation. However, in the course of four tours carried out by me in the past three years, and covering 25 large towns in western Germany, not a single case of undoubted famine œdema, due primarily to lack of food-supplies, has been seen either among children or adults; this despite the fact that the German public-health authorities were often responsible for selecting the subjects examined and had opportunities to produce their cases, if any existed. The last undoubted cases of famine œdema seen by me were at Belsen concentration camp.

Serum-protein determinations have been carried out among samples of the child population in the British and U.S. zones in recent months. It is to be hoped that the results of these surveys will ultimately be published. Without wishing to anticipate their publication, I may say that the results give no grounds for anxiety.

The present extreme shortage of animal protein in the common diet tends to be emphasised by the German public-health authorities as a matter of physiologi importance. But there is good reason to think that t mixture of amino-acids from various vegetable sourc together with the amount of milk regularly provided the ration, are sufficient at least to prevent any seri protein deficiency among children. There can be question, however, that the present supply of milk a other sources of animal protein generally falls far sh of a level that could be considered ideal and, moreov is much below the level to which the Germans h been accustomed.

Fats.—Fat is valuable as an article of diet beca it is a concentrated source of calories and has a h satiety value. Moreover it is extremely useful for cook and for making the diet appetising. Nevertheless th is no good reason for believing that lack of fats is lead to any serious physical damage to children in German

Iron and Calcium.—The results of hæmoglobin det minations carried out on children in the British and U zones were kindly made available for inspection by British and American public-health authorities. Fr the figures submitted I am satisfied that there is important incidence of disabling anæmia among children. Individual cases of pallor suggesting anæ were encountered in the course of examining childr and it is concluded that there is probably a small incide of moderate anæmia, probably due to iron deficien among the city children.

There is no simple clinical way of deciding whether l of calcium is a limiting factor to the growth and devel ment of German children. Milk, the most import dietary source, is provided in good amounts for youngest children, but for the adolescents, especia supplies are seriously below desirable levels. In British zone the supply of calcium is improved by addition of calcium carbonate to the bread, as the practice in Great Britain.

Iodine.—Simple goitre is common among the child in the southern part of the French zone and some p of the American zone. These have always been cent of endemic goitre. There appears to be no defin evidence whether the incidence has altered as a re of the post-war food restrictions. Lack of iodine probably the primary cause, though other factors, as the consumption of certain vegetables, may pl some part.

Dry Skin.—Several cases of unusually dry d quamating skin were observed in almost every group children examined. The incidence appeared to be hig than could be considered normal. However, there is certainty that this can be considered a sign of nutritio deficiency; lack of soap may be an important cont butory factor. In view of this lack it is remarkable h clean and healthy the skin appears in the great majori of children.

ENVIRONMENT AND MENTAL HEALTH

Though the state of physical health and nutrition the great majority of city children is thus relative satisfactory, one cannot feel the same about their ment health. Their daily life is passed in an environment th presents many bad sociological and psychologic influences, tending to encourage insecurity and frustr tion, with the danger of consequent aggressi compensations.

Overcrowding.—Most of the large cities in wester Germany are 20–80% destroyed. Something of th vastness of the problem may be gathered from th calculations of a Hamburg architect that there are, i the whole of Germany, more than 520,000,000 tons o rubble still to be cleared. Probably 1 room in 4 has bee destroyed. In addition, from the influx of refuge Germans 1 person has been added to each 4 who must b housed. Nevertheless, except for the miners, no significant der to be the dictatorial methods being adopted the higher level of bureaucrats both in the research the administrative sphere. They are delighted to visitors from the United Kingdom. No-one is r than they that research work should be expanded, they cannot understand why their opinions are so ily ignored—or at least so it appears to them.

hat is even more disturbing is the suggestion that ng man can start doing sound research the moment rives in a colony. This is fundamentally wrong, t in the case of the basic sciences such as chemistry physics. And Africa is not the place for such basic to be done. The United Kingdom, with its well- pped research institutes, whether university, govern- , or industrial, is the place for such fundamental to be carried out. It is only as the stage of field whether laboratory or clinical, is approached that omes incumbent for the work to be done on the What does not appear to be appreciated in certain rch circles in Great Britain is that no reliable on medical (and nutritional) problems can be d out until the persons undertaking it have a knowledge of the people on whom it is being done of their conditions of life.

ination of Colonial Medical Service and Colonial al Research Service

e second danger is the lack of coördination between Colonial Medical Service (C.M.S.) and the new ial Medical Research Service (C.M.R.S.). In these of the glorification (some would say almost the ation) of research, there is a very real danger of e most promising and outstanding of recruits for C.M.S. being recruited for the C.M.R.S. and, in due e, receiving all the plums of the service in the way ccelerated promotion and the better-paid appoint- The effect of this policy on the C.M.S. would be ous. Any able young doctor proposing to work colonies would immediately go for the C.M.R.S. of the better prospects, thus leaving only the ones for the C.M.S.

is required is that, except in special cases, ment in the first instance should be primarily to M.S. After a preliminary period of, say, two years, r to the C.M.R.S. should be considered if the has shown any special aptitude for research. transfer should never be automatically permanent, ample opportunity should be allowed for interchange een the two services. Conditions of service should e same in both, and there should be equal oppor- ties for promotion to the highest levels. In this the standards of both services would be raised, there would be no opportunity of the health services the colony suffering because of the brains all being ntrated on the research side. After all, a sense oportion must be maintained, and research-workers never forget that, so far as medicine is concerned, rch is the handmaiden of the practising doctor.

SOME PRACTICAL SUGGESTIONS

e critic should always try to be constructive lest be dismissed as being merely destructive. Let me mpt a bare outline of how the Colonial Medical vices should develop.

Conditions of service must be improved immediately; , in view of the developments in this country under National Health Service Act, the salaries to be d under the new scheme must be taken as the basis salaries in the colonies. Unless the financial attrac- s of the colonial services are as great as those in at Britain, the right type of man will never be ained. A scheme must be evolved whereby there l be full interchange between the higher ranks in clinical side in the colonies and in the United Kingdom. For instance, those of registrar status in the United Kingdom should be encouraged to accept positions as consultants in the colonial service for a period, on the strict understanding that by so doing they will lose neither in seniority nor in superannuation rights, should they ultimately decide to return to service in Great Britain. Similarly, promising men of consultant status in the colonies should be encouraged to spend periods of, say, two or three years working in this country, again with no loss of seniority or superannuation rights. This was a point which was emphasised, particularly in connexion with the new medical schools in the African colonies, by the late Professor McSwiney, whose outstanding report on the subject appears to have been permanently lost in one of the many pigeon-holes of the Colonial Office.

On the research side, as already mentioned, the new Colonial Medical Research Service must be closely linked with the Colonial Medical Service. As in the case of the C.M.S., there should be a close association with research-workers in the United Kingdom, both as regards personnel and as regards the work. For instance, it would be a waste of time, money, and man-power to build and equip elaborate research laboratories and institutes in the colonies: the fundamental work in biochemistry, pharmacology, physics, and the like can all be done much better in research institutes in the United Kingdom, provided there is close collaboration with the men in the field—i.e., the workers in the colonies must be consulted about the work to be done, kept in close touch with the progress of the work, and allowed to spend spells in the laboratories in the United Kingdom when necessary. Conversely, the chemists and the laboratory workers in the United Kingdom must visit the colonies at regular intervals so as to be able to appreciate the full implications of the work in which they are participating.

In all these matters the fullest consultation must be maintained with the men in the field. As already pointed out, the present tendency to ignore the men with most practical experience of tropical medicine is not only alienating the members of the Colonial Medical Service but is also tending to the preparation of plans which have little hope of success.

In spite of all that has been said about the necessity for research on such fundamental questions as the incidence of disease and malnutrition, this does not mean that there are no short-term problems to be tackled immediately. Even though we are so ignorant about the nutritional status of the native, there are areas where gross malnutrition undoubtedly exists. Then there are the vital problems of the control of the tsetse fly, the treatment of trypanosomiasis, the use of insecticides such as D.D.T., and the control of helminthiasis. All these can be tackled in a practical manner pari passu with the inauguration of the more elaborate research programmes.

All this will require more men and money, and much more money than the Treasury will concede except under greater compulsion than has so far been exerted. This is not the place to argue the point; but, if it is conceded that the only hope of avoiding world starvation is the full development of tropical Africa, and that this development depends for its success on raising the physical status of the natives and making life there healthier for white men, even the Treasury will find it hard to enforce its conventional obstruction to the necessary expenditure.

But, above all, what is required now is direct access of the C.M.S. and the C.M.R.S. to the Secretary of State. Much lip service has been paid of recent years to the development of the colonies. On the medical side little of practical value has resulted, and it is clear that one reason for this is that the medical services

MEDICAL RESEARCH IN AFRICA

FROM A CORRESPONDENT

Now that it is at last agreed that the only hope of avoiding world starvation lies in the immediate and full development of the food-producing potentialities of tropical Africa, it is evident that medical, veterinary, and agricultural research assumes, to use a popular war-time phrase, "top priority." Officially, this is said to be an accomplished fact, but a recent tour of East, Central, and South Africa raises doubt as to whether the true urgency of the position is appreciated in Whitehall and whether the matter is being tackled in the right manner. The following comments and criticisms apply primarily to the medical aspects.

The urgency has been made abundantly clear by the writings and speeches of such international experts as Sir John Boyd Orr and Sir Jack Drummond. What is not so generally appreciated is the nature and the size of the medical problems involved. If the full food-producing potentialities of tropical Africa are to be realised, it is essential that the physical capacity of the native should be developed to the fullest possible extent. From the medical point of view this involves improving the nutritional status of the native and controlling the diseases to which he is subject—two subjects on which we are still very much in the dark. Through no fault of the members of the Colonial Medical Service, but simply because the men and the money have never been forthcoming, there is still relatively little information about such elementary data as the incidence of disease in different colonies and protectorates. For instance, the full geographical extent of the yellow-fever virus is still unknown. The evidence for the incidence of leprosy in East Africa is entirely inadequate and the first systematic survey of the extent of this disease in East Africa is only now being carried out. Again, there have never been any facilities for carrying out controlled clinical trials of new therapeutic agents there. Anyone with even a superficial knowledge of tropical medical literature must have been impressed with the number of published articles based upon the clinical trial of a new preparation in only 50–100 cases, though thousands (if not hundreds of thousands) might have been investigated if only the Colonial Office had made it possible. Closely interrelated with this question is that of the varying reaction of a disease to a given drug in different parts of the world—even in different parts of the same continent. Kala-azar is a case in point, as are the contradictory reports now being received about the efficacy of 'Paludrine.'

As regards the nutritional status of the native, scientific data are again lacking. Surveys have been made but with one or two notable and oft-quoted exceptions they have merely touched the fringe of the problem. Even those which have been made are partially invalidated by the unfortunate fact that we are still hopelessly ignorant of the physiology and the feeding habits of the normal native. The result has been that socially minded publicists have been making statements about the nutritional status of the native for which there is no scientific basis. For instance, what scientific reason have we for declaring, as is sometimes done (and regrettably, let it be added, by some who have allowed political bias to impinge upon scientific reasoning), that the nutritional requirements of the African native are the same as those of Europeans? Or, to take a more specific instance, assuming for the moment (and it is only an assumption) that the calorific requirements of, say, an 80-kg. native doing a given piece of work are the same as those of an 80-kg. white man, what evidence is there that the native requires the same proportion of carbohydrate, fat, protein, and vitamins as the white man?

THREE MAJOR RESEARCH PROBLEMS

To indicate the problems involved, even in bare outline, is sufficient to emphasise their tremen scope, and it is clear that fundamentally there three major research problems which, though cl interlinked, must be considered separately to a making confusion worse confounded.

First, we must acquire more data on the no physiology of the native and his nutritional st What are his "normal" height and weight? Ar pulse-rate and blood-pressure the same as thos Europeans? Are there any differences between metabolic processes and those of a white man? is his normal reaction to physical exertion and to emot stress and strain? What is his physical stam What are his normal requirements of sleep? Unt have at least some elementary data on such matters, it is impossible to evolve any long-term p for his betterment.

Secondly, surveys must be made on the inciden disease in different areas. How widespread is tub losis, and what form does it tend to take in the nat How widespread is schistosomiasis? What is the incidence of relapsing fever, and what are the relationships between the louse-borne and the tick-l varieties? Closely linked with this subject is th vital statistics. What is the expectation of life i native? What are the infant and maternal mort rates—not in areas covered by hospitals and clinic in the whole colony concerned?

Finally, there is the problem that the mere me of tropical medical research usually suggests—the n of treating such classical diseases as leprosy, ma schistosomiasis, and trypanosomiasis. Here much been accomplished, but much more requires to be particularly in ensuring that trials of new remedie carried out on a sufficiently large scale and with en controls to make the results capable of stati analysis.

TWO DANGERS

Two unfortunate tendencies are appearing in plans to cope with research. It is probably true to that the Colonial Office has accepted the prin that medical research in the colonies is a matte some urgency; but unfortunately, as all too man us are learning from bitter personal experience, time-lag in governmental quarters between accept and action is liable to be all too long. What is n more disturbing, however, is the evidence that action that is being taken is along the wrong lines.

Remote Control from Whitehall

The first danger is that too much control is b exerted from Whitehall, and that insufficient atten is being given to the views of those with years of experi in the colonies. Fundamentally, the approach to rese is the same the world (and science) over, and no would dream of questioning the advisability of obtai advice from experienced research-workers and adn strators in chemistry, bacteriology, nutrition, phar cology, and medicine. But advice is a very diffe matter from direction, and you cannot direct rese in Africa from an office in Whitehall or an armchai the Athenæum. Neither can you send a bright yo research-worker from this country out to Africa expect him to do good work until he has had ac experience of the conditions under which he has to w

Quite frankly, and for the sake of Africa frank is now essential, the workers in the field are becom tired of the continual stream of "experts" being flo out to them for brief tours by the Colonial Of without any definite action being taken as a result their reports. They are resenting even more what th

In England Now

ing Commentary by Peripatetic Correspondents

TY years. I suppose, is a long life for a dining , but our members were very carefully chosen a dozen men who had been close friends all through student years picked the rest. So, though what was a hilarious evening for a bunch of lively young idents has become a more sober gathering of senior with a sprinkling of specialists and oddments, come; and I think the club will survive until all dead, bedridden, or too broke to afford the p.

of the members has died yet: 3 (out of 15) had phthisis and 1 has a colostomy, but they are mbulant: nor do any look potentially broke— of us look thin and ill, and most of us look worried. outsider would guess we were a pretty successful perous lot of doctors. My own first impression year, on seeing them gathered round the cocktail waiting for the gun, is that they have not changed ot in face, or facial expression, or tone of voice. versational gambit: only in hair, for all but 2 are going grey and 1 is getting a little bald. But said outsider was given a flash-back of the club it was founded he would soon spot the effects of years' battering by night-calls, overdrafts, and strations inseparable from family life.

h the same applies to our conversation. Though t one another in the same words we no longer ak at once; we listen, if not gravely (that will in the next twenty years) at least with restraint, at the other has to say. We were always indi- sts, but where once our opinions were second-hand every member knew whom they came from), now are based on first-hand experience plus personal ce, and are therefore almost unshakable— t of twenty years' laying down the law.

of us have boys and girls at school, so there was ual parental false modesty over the children's : "Peter hasn't a hope of getting through Entrance . . . ."; "Jimmie has been two years thelred's and is still bottom of the second form that sort of thing, with an occasional casually remark that Peter or Jimmie won the open yards at the age of 12, or topped the batting at his prep. school, but what's the use of that? ishingly high proportion of us have faced near- in our wives or children; but of that we did not We don't go in for speeches, thank God, but there the usual reminiscences, starting with a "Do you ber . . . ?" to one's neighbour and taken up by after the other across the table. There was that mas when our minstrel troop performed at a home aged sick. The troop arrived to find the inmates round long tables in the big hall, apparently g for our show to start. But half way through the chorus it suddenly became clear what they were —TEA. From the moment when the bread and clattered in the audience never looked our way and such was the clash of knife and teaspoon that oisy show was audible only on the stage, if that. when our president, slightly tight, came on to ince "the next item is a song by Mr. Robinson," re-entered to say "Mr. Robinson will now sing Blue Room," and finally came on a third time and into song the inmates didn't smile. If our outsider peped in while this little story was being pieced her he would have realised that the changes in us 1928 have been merely organic rather than ional.

* * *

e eminent surgeon on my right looked askance at roken nails and roughened scratchy hands, while the ly eminent physician on my left watched and ered why I fumbled with the armament of cutlery. y hadn't a clue—could not guess that throughout week I had been working at a Volunteer Agricultural p, lifting potatoes and picking apples at 1s. 7d. hour. As I gobbled the roast turkey I reflected that previous evening meal had been of meat which might have functioned in the 1938 Grand National and I washed up my simple platter and tools in the communal tub of greasy water. What would our scarlet coated toastmaster have made of that?

From the literature received one fondly imagined one would be accommodated in an ancestral mansion. Alas B— Hall was a ruin and our lot was cast in huts. But having made my bed with the four blankets and pillow provided, I for one at the end of the day's work was ready enough to lie in it, however hard it was, and however restless and adenoidal my campmate in the lower berth might be.

Reveille was at six: no bugle note, but shouts of "Wakee-wakee" and thumpings on the hut side. After a very adequate breakfast—the porridge especially was good, though lacking sugar and milk—we went by lorry car, or bike to our allotted farm, carrying sandwiches whose size was more remarkable than their succulence. "My" farmer had applied for only two volunteers for apple-picking, and my mate was a silent and aloof miss from Surbiton. The fact that it was her second week in camp perhaps accounted for her superiority. We worked from 8 A.M. till 9.30 when there was a short interval for refreshment. At noon we lunched with the other farm-hands in a shed, the farmer providing copious hot sweet tea to combat incipient shock or collapse. Another three hours and we were free to return to camp, feeling we had well earned the 11s. 1d. that Farmer Giles doled out from a huge wad of notes. Personally I don't think he'd made a bad bargain.

There was a certain fascination in apple-picking—the skilful laying of the ladder to ensure the maximum gathering, the delicate touch to prevent one of a great clutch falling, the satisfaction of lifting three at a time in each hand. Some of the fruit, mostly "Lane's," was magnificent, often scaling well over a pound apiece: and a reddening apple with the dew still on it is a far prettier sight than, shall we say, a gangrenous appendix.

The same cannot be said of spud-lifting, where one is the slave of the inexorable spinner and must follow up one's stint ventre-à-terre, keeping pace with the regulars and locals who are paid considerably more for a day's work, so that one has verily to bear in mind the Parable of the Vineyard. It's a backaching, soul-destroying job; but preferable, as well I know, to sugarbeet lifting or to threshing, especially of beans.

Should this be read by the village doctor who (out of surgery hours) courteously lifted an apple twig from my palpebral conjunctiva, I should like again to express gratitude. It was odd I thought that neither of the two uniformed members of the B.R.C.S. who graced the camp knew how to evert a lid and had been warned by doctors against the attempt. Surely it is the simplest of measures, resulting in immediate and miraculous relief of considerable agony.

To one in search of recreation as opposed to holiday I would recommend a V.A.C. But he, or she, must be a good "mucker-in" and have sturdy digestive and sleeping habits. My camp was clean and well run: the food and showers were hot and much was done for one's entertainment and convenience. For my part, I shall go again and add my drop to the ocean of production: albeit my earnings for a week, by the very sweat of my brow, were equalled almost to a shilling by the cost of my Hospital Dinner (plus wine).

* * *

After recovering from the preliminary shudder set up by your annotation *Patients' Reading* (Oct. 9), one has to admit there may be something in the idea. The shudder was solely in response to the notion of "prescribing books like medicine, and requiring a report from the librarian on the effect on the patient." Just imagine ploughing through the folder of notes, path. forms, blood-counts, X rays, and the rest, so swiftly collected by the modern medical case, and then stumbling on a note: "Will the Librarian please see? P.A.; R.B.C. now 3,500,000. Is he strong enough for James Joyce?" Before long I suppose students will be asked the volumes to prescribe for specific diseases and the textbooks on therapy will note "*Gone With the Wind* is almost specific in this condition" and "Meredith may be exhibited, but must be instantly withdrawn on signs of the patient's weakening."

A librarian's advice would indeed go far to prevent occasional unfortunate selections, instanced by the have not had the direct access to the Secretary of State that is essential. One way in which this could be accomplished would be by immediately increasing the seniority of the office of medical adviser to the Minister —if necessary, to that of an assistant secretary of State—so that he would have the direct access which is necessary. If this is done, it is equally essential that the occupant of the post should be a doctor of outstanding ability, both medically and administratively. At the present stage much could be said for appointing him from outside the Colonial Medical Service. Men of the calibre of the late Professor McSwiney, with his unusual combination of outstanding ability in the spheres of medicine, research, administration, and medical education, may unfortunately be rare, but it is such a man who is required at the moment to undertake the reorganisation of the Colonial Medical Service and to ensure that his reforms are transmitted personally to the Secretary of State for immediate action.

W.H.O. CONFERENCE ON STREPTOMYCIN

AT the third session of the *Interim Commission of* the World Health Organisation, at Geneva, in April, 1947, it was resolved to set up an expert committee on tuberculosis. In the first report of the committee,[1] accepted by the Interim Commission, the various field activities and techniques for tuberculosis control were set out and it was stated that the best contribution which W.H.O. can make to tuberculosis research would be in developing and recommending uniform procedures. Special problems would require the services of subcommittees who were expert in highly specialised fields. Among the most urgent of these problems was the evaluation of new chemotherapeutic agents such as streptomycin, and accordingly a conference on streptomycin therapy in tuberculosis was convened in New York on July 30 and 31. The following experts attended: Prof. K. Choremis (Greece), Prof. C. Cocchi (Italy), Dr. Robert Cruickshank and Dr. M. Daniels (United Kingdom), Prof. R. Debré (France), Prof. R. Dubois (Belgium), Dr. H. Corwin Hinshaw and Dr. H. McLeod Riggins (U.S.A.), with Dr. H. E. Hilleboe (U.S.A.), a member of the parent committee, as chairman. In addition, American experts in different fields of streptomycin therapy and in the pathology and bacteriology of tuberculosis were invited to attend the meetings.

In the first three sessions the discussions covered the general principles of chemotherapy in tuberculosis, the results obtained with streptomycin in different forms of tuberculous infection, studies in combined chemotherapy, and laboratory methods for the diagnosis of tuberculosis and for the control of streptomycin therapy. A strong impression from the reports of members from some European countries was that acute tuberculosis in childhood (tuberculous meningitis and miliary tuberculosis) was much more common there than it is in the U.S.A., and that results with streptomycin in these acute childhood infections were more encouraging than earlier reports had suggested. The present position in the chemotherapy of pulmonary and surgical tuberculosis in the U.S.A. was reviewed by Dr. J. Barnwell, of the Veteran's Association, who analysed over 3000 treated cases (shortly to be published); by Dr. Hinshaw, representing the Trudeau Society; and by Dr. Riggins, representing the American Tuberculosis Society; while Dr. Floyd Feldman outlined the trials now being sponsored by the U.S. Public Health Service. The tendency in American centres is to reduce dosage to 1 g. per day (or 20 mg. per kg. body-weight), with a resultant reduction in toxic reactions but with little obvious change in therapeutic effect, and to shorten the duration of treatment 42, or even 28 days in cases of pulmonary tuber in the hope of preventing or minimising the develop of streptomycin-resistant strains of the tubercle ba Remarkable results were reported by Dr. Edith Li in the treatment of small groups of cases of tuberc meningitis and miliary tuberculosis with strepto and 'Promizole' (a sulphone compound), the drug being continued for many months after strepto therapy was stopped. Dr. Daniels described the org tion, under the ægis of the Medical Research Co of the streptomycin trials in tuberculous menin miliary tuberculosis, and progressive bilateral pulm tuberculosis in Great Britain. Laboratory me were discussed by Dr. Cruickshank and Mr. W. Stee while Dr. R. J. Dubos made a strong plea for dis "egg-concoctions" in favour of the oleic acid and albumin diagnostic medium for the isolation of tubercle bacillus.[2]

At the final session, attended only by members W.H.O. subcommittee, recommendations were dr concerning the use and value of streptomycin in t culosis. The following points were stressed:

> In most forms of tuberculosis streptomycin is at be adjuvant to other recognised therapies; its use is not d of risk of the development of toxic reactions, and, serious, of streptomycin-resistant tubercle bacilli which be transmitted to exposed contacts.
>
> The drug should at present be distributed through go ment or other responsible health agencies to hospital institutions where it can be used under expert superv Patients with tuberculous meningitis and miliary tuberc in whom the use of the drug can be a life-saving proc should have priority.
>
> In certain other forms of tuberculosis—e.g., acute monary, tracheobronchial, sinuses, and fistulæ—strepto judiciously used, could be a useful adjuvant for therapy.
>
> Size and duration of dosage could not yet be defined narrow limits.
>
> The wide variations in methods of reporting the resul streptomycin treatment from different centres made parisons of the efficacy of different therapies impossible, the committee urged the adoption of certain minim standards of reporting which will render such compar possible and valid.
>
> *W.H.O. should continue to encourage and facilitate* i national study and coöperation in researches on chemotherapy of tuberculosis.

The memorandum embodying these recommendat has now been accepted by the tuberculosis ex committee and forwarded for approval to the execu board of W.H.O.

After the conference, the delegates made a week outing to the Homer Folks Sanatorium, Oneer belonging to the New York State Department of Hea where many clinical and laboratory problems in streptomycin therapy of tuberculosis were discussed detail.

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[1] *Bull. World Hlth Org.* 1948, 1, 205.

[2] *Amer. Rev. Tuberc.* 1947, 56, 334.

"... sickness used to arise from too little food. Nov comes from too much worry. Doctors could only allevi not cure, the old kind of disease until social conditions w improved. To-day they can only deal with the symptoms the present diseases, because they cannot produce wo stability. Add to this the fact that modern medicine is w on the road to abolishing, or at any rate rendering unimporta many of the more serious illnesses that used so often to fatal, like diphtheria and pneumonia, and you see that or again science is giving us the physical tools of mastery, b they are not much use to us because we remain mental a lot of frightened, irresponsible, and neurotic children."—*New Statesman and Nation*, London Diary, Oct. 9, 194 p. 297.

two mean temperatures (0·76 ± 0·05°F) is highly nt, t being 14·97, and P less than 0·01.

temperature curve obtained by superimposing 22 known ovulatory temperature curves may be rded as characteristic of true ovulation, as proved by onset of pregnancy. The change between the mean ulatory and postovulatory temperature levels red sharply and within a period of twenty-four in the 22 women.

e basal body-temperature curves of a patient under vation for infertility show significant differences in rate of the ovulatory rise of the temperature at mid-intermenstruum. The mean preovulatory temture in 12 consecutive menstrual cycles was 98·29 ± F, and the mean postovulatory temperature 98·91 ± F. The difference (0·62 ± 0·05°F) is highly significant of the same order as observed for fertile women, g 12·60, and P less than 0·01. However, the mean temperature rose gradually rather than abruptly g the five-day interval between the mean pretory and postovulatory temperature phases. A cant rise above the mean preovulatory temperature did not take place until the fifth day after the start e change, compared with one day in normal fertile en.

e patient has no demonstrable pelvic pathology. tubes are patent, and her basal body-temperature and the histological appearance of her endometrium compatible with regular ovulation and corpusformation. She has been under the care of doctors for the investigation and treatment of ility during the past eight years. Numerous nations with seminal fluid containing normal atozoa in quantities between 100 and 250 million ml. have been carried out, without success. It is ceivable that normal active sperm could have to fertilise an ovum at one time or another if ever vum had been available. While the cause of her ility is unknown, it is therefore presumed to be due hanical failure of ovulation. It is also believed that owly rising type of temperature curve which this exhibits may be regarded as an abnormal type e associated with the mechanical failure of

detailed report which is being prepared will additional experimental evidence in support of clusion.

ncisco, California. ALLAN PALMER.

INDEPENDENCE IN RESEARCH

—Sir Henry Tizard's inaugural address as president British Association, and the *Times* leading article pt. 9, both fail to emphasise one most vital factor e progress of scientific research: it is the virtual ssion in this country of the independent thinker the laboratories wherein he used to carry out his ents, and the restriction of facilities for research ch workers as find favour with a small but powerful p of "experts." This narrows the lines of approach thwarts the efforts of the independent thinker who past has supplied nearly all fundamental progress. entirely agree with the *Times* on the importance of biological sciences in the problems of disease in man, ls, and plants. But why then has an independent like the Brown Institution—where this fact was ed and acted on—been suppressed? Probably the infectious diseases in the world are due to one other filter-passing virus, and the most fundamental lem in relation to their control is to be able to grow —apart from other forms of life—according to their iological requirements.

e writer had an extensive research on this problem ped out and in progress when in 1944—with the tion clearly indicated in many experiments— laboratories were destroyed by a bomb. Much of the al apparatus which had been built up was salvaged now lies idle at Camberley. Why—I ask—have laboratories not been rebuilt, or some existing ding acquired wherein the necessary equipment could reassembled and the writer given facilities for coming this vast research, possessing, as it does, an nomic value of many millions of pounds sterling? It was at the Brown Institution that the writer solved the problem of producing a diagnostic vaccine for Johne's disease of cattle, thereby bringing it under control, and later laid the foundation of much modern work on viruses by the discovery of the "bacteriophage." The research on the growth of the virus group as independent forms of life was being equally successful when the writer was deprived of his post and all facilities for continuing this and other researches on hand.

Camberley, Surrey. FREDERICK W. TWORT.

M.R.C.P. EXAMINATION

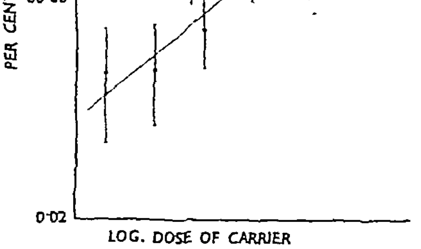
SIR,—Sir Henry Tidy's thought-provoking and illuminating letter of Sept. 25 interests me very much. I have been amazed to find how rapidly two Censors can uncover my points of weakness in the clinical examination lasting eighty minutes: now I am more amazed that a Censor can in fifteen minutes mark a paper which I, who have just written it, cannot read through in that short space of time. This examination sets out to be a test in clinical medicine; the papers are remarkably clinical in their application, and the clinical itself is certainly a test of powers of observation and ability to make up one's mind, and a battering from two very well-informed gentlemen who want to know how well one's mind is made up and will shatter one's opinion if they can.

A man working in hospital outside the select teaching group has no other opportunity to prove and improve his standard. Experience alone teaches. The clinical examination can be an exhilarating event, even for the candidate who fails; for excellent cases are presented in an atmosphere of such tension that detail is long carried in the mind, and I learn as much in the eighty minutes as otherwise I might in perhaps a fortnight. It is therefore well worth while "having a go" though pounds are scarce and the cost of such a visit to London is high.

THRICE TRIED.

ASSESSMENT OF DIPHTHERIA PROPHYLAXIS

SIR,—I have read with interest Dr. Bousfield's article of March 8, 1947 (p. 286) on his clinical trials of Holt's diphtheria prophylactic P.T.A.P. The efficiency of immunising procedures in general, and of diphtheria prophylaxis in particular, can be better evaluated if one utilises certain statistical devices in considering the quantitative relationship between the vaccine potency and the results obtained. In estimating progress in prophylaxis one must take into account the individual differences in reaction; those who are least responsive to immunisation require a relatively very great increase in vaccine potency if inoculation is to be successful.



With regard to diphtheria prophylaxis, an examination of the data given by Hartley[1] for guineapigs shows that when the quantity of toxoid injected was increased from 2·5 Lf to 5 Lf, the Schick-conversion rate rose from 40% to about 85%, but a further increase to 20 Lf only raised the conversion-rate to 93%.

The information supplied by Bousfield revealed a similar phenomenon. He immunised groups of children with 5 Lf of purified diphtheria toxoid adsorbed on to increasing amounts of aluminium phosphate carrier. In this work the increase in Schick-conversion rate sufferer from persistent jaundice who chose on too superficial but sympathetic grounds *Forever Amber*, and the G.P.I. who roared his head off all the way through one of Laski's books on Socialism, no less. Then there is the complication first described by P. G. Wodehouse, the physical weight of the tomes offered for recumbent reading. The patient with epigastric tenderness could hardly be expected to stomach Scott; he should be started on Shelley, progressing through Bacon to the Brontës. Digestion of the first three chapters of *Vanity Fair* indicates complete symptomatic relief.

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[1] Hartley, P. *Wiss. Woche Frankft a. M.* 1934, 3, 81.

Uncoöperative sufferers on extra fluids will do well on P. C. Wren, or might advantageously have *The Ancient Mariner* recited to them t.d.s. Victims of anorexia nervosa could only thrive on Damon Runyon's *Piece of Pie*, in which a character by the name of Nicely-nicely Jones enjoys an eating competition of toothsomeness more than somewhat. The B.M.R. in thyrotoxicosis can be lowered to normal in a week by *Paradise Lost*, and Gibbon will quieten even acute mania. Anyone with a gastric ulcer should be put to bed with a copy of Lin Yutang's *Importance of Living*, while the essays of Stevenson and Lamb can knock at least 50 mm. Hg off a hypertensive blood-pressure. *Alice in Wonderland*, followed by anything from Chesterton and Belloc, may be reserved for the non-specific restoration to sanity in us all. Pregnancy will pass peacefully with Jane Austen. For general depression how about Leacock, Thurber, Benchley, et al.? For lethargy there is always Peter Cheyney, and insomnia may be instantly relieved by any reputable textbook on hæmatology.

* * *

As usual at this season the winter-pants problem has been causing me concern. Whether to don them as soon as the mornings get chilly and be boiled by midday; or to start work blue and begin to feel about right at lunch-time. This isn't a question on which tradition gives any guidance. Everyone knows that he must ne'er cast a clout till May be out (though there is some disagreement about the capital letter in "May"); but on when to resume the cast clout the wise rhymesters are silent. No-one says:

> Don thy woolly smock
> *As soon as it be Oc.*

Or:

> When chestnut leaf do fall
> Cotton ain't no use at all.

Or even:

> Car won't start in the morning
> Shepherd's warning.

Clearly it was the chills of late spring, rather than of early autumn, that our ancestors feared. Anyway, since it is looked on as eccentric, even at the peculiar club where I feed, to doff one's underwear in the cloak-room, I support that school which stays in bed till noon and carries on to the bitter end with the summer-weights.

* * *

I find in the *Medical Times* of March 17, 1849, the following "advertisement of a Doctor, on his arrival in the Brazils":

Estimable Brazilians! generous inhabitants of Rio Grande! the celebrated Doctor——, who, in different years, has visited Rio Grande, Porto Alègre and San Francisco has returned to your beautiful province with the firm determination to live and die among you! Generous inhabitants of Rio Grande! do not forget it is the same Doctor who amputated so many arms at Cassapara, so many legs at St. Gabriel, who excised so many jaws at Allegreto, extirpated so many testicles at Rio Pardo, so many breasts at Bargé! And, what is more, if you ask how many deaths followed these colossal operations, ask those who best can tell, and they will answer, Not one! Remember, also, it is the same Doctor who has enlarged the calibre of so many hundred contracted urethras without one relapse! Here, then, here I am! hasten to come to me! In less than seven days, I will make those that urinate in a stream as small as a hair, pass their water the size of a cable; I will treat homœopathically those who desire it; I will cure your fistulas without cutting; I will accept no money when patients die;—in a word I will especially treat all diseases, &c., &c.

Letters to the Editor

UNFORTUNATE NAMES OF HOSPITALS

SIR,—Lately an elderly man was investigated
inpatient in the throat department of a hospital
found to be suffering from carcinoma of the la
It was decided to transfer him direct to the C
Hospital for radiotherapy. His wife on arriving
one day found this telegram: "Bed available a
Cancer Hospital." Though she is a stolid w
she was very much upset. The diagnosis of cance
not been suggested to her before.

Is not there a good opportunity now to change
name and others (such as the Brompton Hospit
Consumption and Diseases of the Chest) which
cause alarm and despondency?

London. A

INFERTILITY DUE TO MECHANICAL FAIL OF OVULATION

SIR,—The failure of pregnancy to take place
appreciable percentage of apparently normal w
has led to many theoretical discussions on the cau
infertility. In spite of normal ovarian function, rev
by apparently normal basal body-temperature c
hormone-excretion studies, and normal histol
changes in the endometrium, mechanical failu
ovulation may occur regularly in some women
only occasionally in others.

Mechanical failure of ovulation occurs common
lower animals. Anyone acquainted with the tech
and interpretation of the Friedman test for preg
has observed two types of so-called "ovulation
positive reactions. Usually one sees large round b
hæmorrhagic follicles lacking apparent rupture
on the surface of the ovary. Endocrinologically,
corpora hæmorrhagica are "normal" in so far as
become functioning corpora lutea. They may, how
contain imprisoned ova, for ovulation, associated
the extrusion of the ovum, has not taken place. I
less common type of positive reaction, especially
an immature rabbit is used for the test, one may find
ovulation points. These appear as tiny almost pin
raised bright cherry-red papillæ. They are seldom
on the surface of corpora hæmorrhagica, and dev
when mature graafian follicles have ruptured and
charged their ova. The corpora hæmorrhagica that
form under these points after mechanical rupture of
ripe follicles are not so large or so readily seen as
corpora hæmorrhagica which develop in unrupt
follicles.

Possibly similar corpora hæmorrhagica and cor
lutea, not preceded by rupture of the follicle, ma
found in women. This would explain the occas
records of ovarian pregnancy. In such a case an ov
probably fertilised by a sperm that penetrates
ovarian capsule, and pregnancy develops without
ovum ever leaving its follicle.

It may be safely assumed that ovulation charact
by rupture of the mature graafian follicle occur
menstrual cycles in which conception takes place.
basal body temperatures of women who by this crite
have definitely ovulated have been analysed. It wil
remembered that body temperature in the few d
preceding ovulation in women is slightly but significa
lower than the temperature in the few days after ov
tion has taken place. This difference can be demonstr
in all women who appear to have normal cyclical ova
function.

The mean preovulatory temperature was 97·7
0·40°F in an unselected sample of 22 women un
investigation for infertility and in whom concept
took place during cycles for which basal body te
peratures were available. The mean postovulat
temperature was 98·51 ± 0·34°F. The mean preovulat
temperature was calculated from all of the temperat
records of the 22 women during the five-day peri
before the ovulatory rise began. The mean postovulato
temperature was calculated from all of the temperatu
recorded by the 22 women for a five-day period five da
after the ovulatory rise began. The difference betw

were rationed, it is true ; but anyone could obtain away from home which would make a couple of h restaurant repasts look very foolish. The applies in most other places in Europe.

is clear we shall not die from lack of fat. But, ed as it is with a low protein intake, and a low calorie diet, there is little doubt that general ncy is being impaired at a time when it is urgently

on, W.1. NEVIL LEYTON.

* We do not share our correspondent's belief that tzerland everybody can afford to eat regularly in ants.—ED. L.

UNDER TENSION

,—A Daniel has come to judgment ! THE LANCET g to resolve the international tension. And how. ems THE LANCET has discovered that England between two Great Powers and could act as or. One seems to have heard this wishful thought and not only expressed in English, but in French, gian, Swedish, and, until lately, in Czech. The *late* nes and the *late* Mr. Masaryk were most eloquent is subject. As a preliminary exercise in the rôle ator, it might be a good idea if one or two rs of the editorial staff tried their hand at recon- the conflict between Western bourgeois biology Marx-Leninist biology. They should visit Leningrad, ourse. For full measure, THE LANCET offers the ion that it takes all sorts to make a world. This kind of half-truth so common in proverbs. Tolera- and an accommodating attitude are admirable ies in the daily traffic of civilised life, but no one ir senses adopts this easy attitude towards another, repeatedly attempts to destroy him and who ims, fortissimo, his intention of going on trying he does destroy him. As THE LANCET is fond of bs I commend the wisdom of the one about the r and his last.

gton. P. D. H. CHAPMAN.

INDEX FOR FILM RECORDS

May I draw your attention to the paragraph s heading in your issue of Oct. 2 ?

e of 35 mm. film and camera for copying docu- journals, &c., should be referred to as "micro- " and not "photomicrography." The latter reserved for the photography of specimens through scope system.

filing system mentioned in your note is of little r the storage of filmstrips. It is, however, an nt file for 35 mm. negatives in short lengths (six ives), and in this sense could be used for storing ives of filmstrip. A filmstrip proper usually ns more than 20 frames in a continuous length

proper storage of filmstrips, as opposed to negatives, ffered difficulties in the past, and unfortunately the system mentioned does not provide the answer.

tminster Hospital Medical PETER HANSELL
School, London, S.W.1. Director of Medical Photography.

* We are grateful to Dr. Hansell for pointing our use of the word "photomicrography." As ds his other criticisms of our review, many teachers short lengths of the film with 2, 4, or 6 pictures se of their flexibility, which longer filmstrips lack. short filmstrips are useful in building up collec- of material and it is for such collections rather for the long filmstrip that good indexing is lly useful. Dr. Hansell rightly says that the od described is excellent for storing groups of up 6 negatives ; we think it equally useful for filing ps of up to 6 positives.—ED. L.

". . . truth which is unpalatable always calls forth persecu- The biologists suffer most, for biology intimately ts man and its truths are usually offensive to his emotions. physical sciences . . . do not generally raise emotional ts. . . . But the theory of evolution touches their pride they are not content to disbelieve it for themselves, but to suppress its acceptance by others."—*The Medical* r, Oct. 2, 1948, p. 143.

Obituary

GEORGE TRENCH WESTERN,

M.A., M.D. CAMB.

Dr. G. T. Western died on Oct. 5 at Chalford, Gloucestershire, to which he retired in 1938 from his appointment as physician in charge of the inoculation department of the London Hospital.

He was born in 1877, the son of the late G. A. Western of Shortlands, and he was educated at Monkton Combe and Pembroke College, Cambridge. There he took up rowing, and in 1901 he was spare man for the university boat. It remained one of his enthusiasms, and even when he retired he still took an oar and could exhaust many of his juniors. From Cambridge, where he took the natural sciences tripos in 1899, he went to the London Hospital, and after graduating in 1905 he was appointed one of Prof. William Bulloch's assistants—a distinguished group including Ledingham, Twort, McIntosh, Fildes, and Benians. Bulloch was at that time much interested in Almroth Wright's work on opsonins, and encouraged Western to develop it, giving him the charge of the inoculation department where he was to remain for the next 33 years. His published work included several papers on the treatment of puerperal septicæmia, and he made a considerable study of current methods of raising immunity to tuberculosis. During the first world war he collaborated with L. Rajchman in a special report to the Medical Research Committee (as it was then called) based on 878 cases of bacillary dysentery received from the Eastern Mediterranean.

Working as he did in Professor Bulloch's department in the medical college, Western did none of the routine bacteriological work of the London Hospital, but he was often called in when some special investigation was necessary. His heavy build in no way suggested the deftness he displayed in his bacteriological manipulations, and it came as a surprise to see him extract blood from the smallest vein with a skill that could not be surpassed.

Although a familiar figure to many generations of hospital men, he was less well known as a person—partly, no doubt, because of the isolation of his laboratory in the medical college, but also partly because of an austere and rather discouraging manner in the early days of acquaintance. Climbing was his great passion, and he went to Switzerland every year, except during the war, between 1899 and 1938. In these years he introduced several London Hospital men to climbing, and nothing gave him more pleasure than to see his pupils, after their apprenticeship, become members of the Alpine Club. One of them recalls him as "an exacting instructor, who would never allow carelessness of any sort. His slow and steady walk up to a hut gave an impression of reliability and endurance, but no indication of the ease and grace with which he climbed rocks, moving with effortless speed and rhythm. On off days he was a restful and delightful companion, and on these occasions there was no end to his vivid descriptions of climbs he had done in the past. In 1938, his last climbing year, he was still full of enterprise, and with two others, both of whom he had taught, he did several climbs he had not done before. Only few of those who knew him had the privilege of seeing him in this setting where his outstanding qualities of strength, reliability, and good companionship were so clearly shown."

When war broke out again in 1939 Western left his attractive home in the Cotswolds, and joined the Royal Army Medical Corps as one of its oldest lieutenants. As bacteriologist at the military Hospital for Head Injuries, at Oxford, he retained his London Hospital title of "Daddy Western," but acquired a new ancillary occurred with increase of *carrier*. When the amount of carrier injected was increased from 0·3 to 0·9 mg. the Schick-conversion rate rose from 12 to 72%; and when the amount was again increased to 7·5 mg. the conversion-rate was 91%.

This phenomenon can be accounted for if allowance is made for the normal distribution of the predisposition to immunity. This distribution accords with the law of normal distribution, or the law of Gauss-Laplace.[2] Applying these equations to Bousfield's figures, we see that the relationship between log. dose (mg. of $AlPO_4$ carrier) and percentage Schick-conversion rate expressed in probits is linear—in agreement with the Gauss-Laplace law (see figure). This statistical finding clearly confirms the consistent progress accomplished by Holt in devising his new diphtheria prophylactic.

Instituto Sieroterapico Italiano,
Naples.
E. CARLINFANTI.

HOSPITAL ADMISSIONS AND RECORDS

SIR,—The report from King Edward's Hospital Fund, reviewed on p. 578 of your last issue, will be welcomed by records officers, because it recommends the adoption of principles for which those actually engaged in hospital record keeping have been striving for a long while. It implicitly recognises that the job of records officer is a reality. It was, indeed, to achieve just such improvement as this report urges, that records officers up and down the country have formed an Association of Medical Records Officers. They have begun to put their own house in order by pooling their experience and by making arrangements for the more highly trained to provide educational courses for those who are not in touch with modern techniques and for new entrants to the service.

The recommendation that the hospital should have a records committee—elected by the medical committee from among its members and including the chief administrative officer of the hospital and a representative of the nursing staff—should greatly facilitate the work of the lay records officer by encouraging coöperation and providing a channel through which each member of the hospital team can acquaint other members with special difficulties.

The report remarks that there is at present no recognised training for records officers and urges that some regularised course should be agreed upon. An interim course has, in fact, been worked out by our association and a beginning has been made with weekend lecture courses at teaching hospitals at Bristol, London, Manchester, Cardiff, and Sheffield, with further courses to come at Leeds, Newcastle, and other centres. At these courses, to which hospitals within the appropriate regions are invited to send records staff, lectures and demonstrations are given on the following: hospital organisation; office management and selection of staff; appointments system; registration, admission, and discharge procedure; case-history routine; follow-up systems; forms, filing methods, indices, office equipment, and paper control; diagnostic nomenclature; and hospital statistics. It is hoped later to organise full-time training.

B. BENJAMIN
Chairman, Association of Medical Records Officers.

A SIMPLIFIED ROTHERA'S TEST

SIR,—The anticipation and prevention of severe ketosis is so important in the control of diabetes that a simple method of testing for ketone bodies is almost a necessity. The ferric-chloride test has been found unsuitable for use by patients, because (1) to do the test correctly may involve filtering off a precipitate and adding more ferric chloride, a procedure too complicated for many; (2) the colour of a positive reaction is often not properly recognised; (3) the test has many fallacies; and (4) in diabetics where the onset of ketosis is very rapid the test is somewhat too insensitive. Rothera's test is much more satisfactory, provided the patient is warned of its great sensitivity, but the procedure is beyond the mental capacity of some—particularly those who through carelessness or lack of intelligence are liable to slip into a dangerous ketotic state.

To overcome these disadvantages a "powder" for ketone bodies has been evolved. The most s factory composition of the powder has been found t sodium nitroprusside 0·5%, anhydrous tribasic so phosphate 12·5%, and ammonium sulphate The exact proportions are not important, but the ab mentioned mixture gives a powder which does develop any interfering colours. It is important, ever, to ensure that the salts are dry before they mixed. Some of this powder has now been kept corked bottle for eight months and is still perf satisfactory. Some batches deteriorated where adeq care was not taken to ensure that the sodium phosp was really dry.

The test is carried out by moistening a small p the powder with a drop of urine, the colour being at the end of 3–5 min., a procedure well within capabilities of the poorest intelligence.

It may be objected that the test is too sensiti 0·02% of acetone just produces a purple colour 5 min., and the same concentration of diacetic produces a definite purple colour. We feel, how that this sensitivity is an advantage if the patient told that the final colour must be very dark before need report. To obviate any mistake, paper of the colour for comparison is being prepared. The dev ment of the ketosis can be watched by the patient several days, and so adequate warning of the cond is obtained. Those who are sufficiently intelligent make appropriate alterations in dosage of insulin a their diet.

For the past eight months all diabetic patien one of us (G. A. S.) have been instructed in the use o powder. Without exception they have all found the easy to perform, and none are confused by it. It is rare that even a weak positive result is obtained three patients have reported to hospital because strong positive result (confirmed in hospital), so ena the ketosis to be corrected without difficulty.

Armed with this simple test, the diabetic pa should be ensured against going unwittingly in dangerous diabetic coma.

G. A. SMART
Lecturer in Medicine, Bristol Unive
G. H. DARLING
Chief Pharmacist, United Bristol Hosp

DIETARY FAT

SIR,—The question of minimum fat requirement the diet, raised in your issue of Sept. 18, is of g interest. But it cannot be solved simply by ex ments which go to show whether there is a lack so that it is demonstrable by chemical analysis. N statistical evidence of increased disease incidenc much value. By the time such evidence is avail we all know too well that a deficiency exists.

Neither can lack of one factor be divorced consideration of others. For instance, though carbohydrates are probably adequate, our pro intake is low.

In this country we have been strictly rationed eight years now. Before this, limitation of food unknown; which means that, apart from phy deficiency, the psychological factor must be taken consideration. Though this latter is occasionally m tioned it is rarely given the prominence it deserves.

Some animals are herbivorous by nature; but mos us prefer to eat meat. In the same way the majo not only like food which requires fat for cooking, they miss the staying power of the fatty food fac the last to be digested. Indeed, it is admitted t people feel hungry sooner than they used to do. race that does not consume much fat presumably can have developed that particular desire. Also, it is kno that dwellers in hot countries do not require fats in s quantities as those who live in temperate or cold areas

So far as Europe is concerned experience of countries since the war[1] makes me certain that Brit is the worst off, apart from parts of Germany. T Swiss have complained to me that I have misrepresent their fat and meat intake. But this is not the ca and on histamine and acetylcholine. More and more appear from subsequent work that adrenaline, hista- and acetylcholine were three substances which the body for many different purposes. It now appeared that the of a large number of chemical substances in the body to modify or interfere with the action of adrenaline or or acetylcholine. It seemed possible that local and analgesics were substances which antagonised action of acetylcholine at sensory nerve-endings, or in parts of the central nervous system and that the power of es to lengthen the refractory period of heart muscle be related to their antagonism to acetylcholine in the of cardiac tissue.

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[2] See Carlinfanti, E. *J. Immunol.* 1948, 59, 1, and *Ibid* (in the press).

[1] Leyton, N. A Survey of our Subnutrition. *Med. Pr.* 19 218, 331.

interrelation of properties of local anæsthetics, spasmo- and analgesics made it worth examining all compounds to exert one of these properties for its possession of others. A substance introduced as a local anæsthetic be, for example, a still better spasmolytic. It was because anti-histamine substances possessed the properties that they produced side-effects. If they were analgesics it was not surprising that they caused mental and depression, and if they were atropine-like it surprising that they caused dryness of the mouth.

other way in which the grouping together of many es as fundamentally the same was useful was that it some order into the long list of apparently unrelated alkaloids. The similarity in many properties of atropine, and quinine, and of conessine from kurchi bark suggested points of biochemical similarity, thus towards an understanding of relationships. These surely justified the pharmacologist studying the of acetylcholine, histamine, and adrenaline in the body. studies were likely also to advance the practically subject of chemotherapy.

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ity of London

E. M. Crook, PH.D., gave the first of four public lectures College, Gower Street, W.C.1, on the Electron and its Biological Applications. The other lectures on Mondays, Oct. 18, 25, and Nov. 8, at 4.45 P.M. Nov. 5, at 5 P.M., Prof. G. Levi, of the University will deliver a lecture on Relations of Interdependency various parts of the Nervous System in the Embryo Adult.

Cruickshank has been appointed to the chair logy at St. Mary's Hospital medical school as from

shank, who is 49 years of age, was educated at Strichen school and the University of Aberdeen where he graduated honours in 1922. For the next two years with an Anderson fellowship he worked at Aberdeen and at where he later became resident medical officer at the for Children and assistant medical officer at Belvidere Diseases Hospital. In 1925 he graduated as M.D. honours. He held the McRobert lectureship in cancer Aberdeen in 1927, and in the same year he was the of the Hutchison prize for his essay on intestinal In 1928 he was appointed lecturer in bacteriology of Glasgow, and he also held the post of bacterio- the Glasgow Royal Infirmary. In 1936 he came to London to the group laboratory at the L.C.C. North-Western Three years ago he was appointed the first director of laboratory of the Public Health Laboratory Service at and during the past three years he has also been acting teacher at the London School of Hygiene. In Cruickshank delivered at the Royal College of Physicians lectures on Pneumococcal Infections. He was a lecturer in 1943 and gave the Frederic Still lecture on in Infancy to the British Pædiatric Association in 1945. published work includes papers on the biology of the vagina, infection of burns, staphylocoagulase, diagnosis of pertussis, spread of infection, and the control of dust-borne strep- infections. He was joint editor of THE LANCET manual *of Common Fevers* and a sectional editor of *Recent Advances Pathology*. In 1946 he was elected F.R.C.P.

rsity of Leeds

annual dinner for past and present students of the school will be held at the Great Northern Hotel, on Friday, Nov. 26, at 7.30 P.M. Dr. J. T. Ingram and Lord Moran will be the principal speaker. may be obtained from the secretary of the Students' Council at the school before Nov. 14, 1948.

ical Practitioners' Union

Bruce Cardew has been appointed general secretary to Practitioners' Union and editor of the *Medical* in place of Dr. A. Welply, who has retired.

Royal College of Physicians of London

A course of lectures will be given at the college, Pall Mall East, S.W.1, at 5 P.M. daily from Nov. 2 to Dec. 17. Applications should reach the registrar by Oct. 25.

Westminster Hospital and Medical School

The annual dinner for past and present students was held in London on Oct. 2 with Sir Arnold Stott in the chair. The speakers included Mr. G. H. Macnab (dean of the Medical school), Mr. H. E. Harding (subdean), and Sir Adolphe Abrahams.

Northern Ireland Health Service

In Northern Ireland about $1^1/_4$ million people—93% of the population—have placed their names on doctors' lists under the health scheme. These figures have been given by Mr. William Grant, minister of health and local government, who said that 730 doctors had so far joined the service.

National Marriage Guidance Council

Miss Phyllis Bottome will deliver the Donald Gillies lecture at the Royal Society, Burlington House, London, W.1, on Wednesday, Oct. 20, at 6 P.M. She is to speak on Love and Marriage. Sir Eardley Holland will be in the chair.

Scottish Society of the History of Medicine

A meeting of this society will be held at the Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, on Wednesday, Oct. 20, at 5.30 P.M., when Prof. J. D. Mackie will speak on the History of Glasgow, and Mr. A. L. Goodall on the History of the Faculty.

St. George's Hospital

Dr. Anthony Feiling and Dr. Desmond Curran are to give a series of lecture-demonstrations in neurology and psychiatry at the medical school during the autumn term on Thursdays at 4.30 P.M. They are open to all doctors and senior students.

Parentcraft in the Home

The National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality is holding a conference on this subject at the Y.W.C.A., Great Russell Street, London, W.C.1, on Friday, Oct. 22, at 10.30 A.M. Dr. Leslie Housden will be in the chair.

Royal Society of Medicine

Norman Gamble Fund.—The committee of award will shortly consider applications for grants from this fund in aid of research in otology. Applications should reach the secretary of the society, 1, Wimpole-street, London, W.1, from whom further particulars may be had, not later than Nov. 25.

King Edward VII's Hospital for Officers

Queen Mary is reopening this hospital at Beaumont House, Beaumont Street, London, W.1, today, Oct. 15. The hospital has 2 wards of five beds and 2 of two beds, where nursing and maintenance will be free. There are also 17 single rooms where a charge will be made. Patients make their own arrangements with their physicians and surgeons. Regular and retired officers of the three Services are eligible for admission; also all temporary officers who fought in the 1914–18 or 1939–45 wars provided they become subscribers. Applications should be made to the house-governor.

Alamein Village Settlement

In his address to students at the annual prize-giving of Charing Cross Hospital on Oct. 7, Field-Marshal Viscount Montgomery of Alamein referred to the Alamein Village Settlement intended largely for men discharged from the Services because of tuberculosis. It will be run, he said, in conjunction with the existing village settlement at Enham, near Andover, Hants, which was established for disabled men after the first world war. It is hoped that accommodation will be found for 500 ex-Service personnel who will be taught a trade and given the opportunity of partaking in the industries of Enham. There will be a hostel for the men without families, cottages for those with families, a village club, a church, and a hospital.

reputation as a most efficient and economical, if autocratic, messing officer, who kept bees and grew vegetables in the hospital garden—and treated everyone alike regardless of rank. As an old member and treasurer of the Cambridge Graduates Medical Club he was to have attended its meeting last week.

He married in 1907 A. S. Carter, and had a son and two daughters.

Diary of the Week

OCT. 17 TO 23

Monday, 18th

Royal College of Physicians, Pall Mall East, S.W.1
3 P.M. Dr. F. M. R. Walshe, F.R.S.: Structure of Medicine and its Place among the Sciences. (Harveian oration.)
Royal College of Surgeons, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. D. W. Smithers: High-voltage X Rays in the Treatment of Malignant Tumours at a Depth.
Society of Apothecaries, Black Friars Lane, E.C.4
5 P.M. Prof. D. F. Cappell: Clinical Importance of the Rh Factor.
Hunterian Society
8.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Dr. G. R. Mather Cordiner: Rôle of Radiology to the Peptic Ulcer Problem. (Presidential address.)

Tuesday, 19th

Society of Apothecaries
5 P.M. Mr. H. Osmond-Clarke: Rehabilitation of the Physically Injured.
Institute of Dermatology, 5, Lisle Street, W.C.2
5 P.M. Dr. F. Ray Bettley: Papular Dermatoses.
Society for the Study of Addiction
4 P.M. (11, Chandos Street, W.1.) Dr. J. Yerbury Dent: Treatment of Anxiety and Addiction by Apomorphine.

Wednesday, 20th

Royal College of Surgeons
5 P.M., Prof. J. Paterson Ross: Surgery of the Sympathetic Nervous System.
Society of Apothecaries
5 P.M. Dr. Macdonald Critchley: Modern Treatment of Some Neurological Disorders.
Harveian Society
8.15 P.M. (26, Portland Place, W.1.) Dr. Samuel Oram: Pulmonary Embolism.
Royal Institute of Public Health and Hygiene, 28, Portland Place, W.1
3.30 P.M. Dr. Peter Henderson: Epilepsy in Children.
University of Glasgow
8 P.M. (Department of Ophthalmology.) Dr. Byron Smith: Plastic Surgery of the Eyelids.

Thursday, 21st

Royal College of Surgeons
5 P.M. Mr. P. H. Mitchiner: Surgery of Sepsis.
Society of Apothecaries
5 P.M. Dr. R. R. Trail: Treatment of Pulmonary Tuberculosis.
Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W.1
7.30 P.M. Dr. J. T. Duncan: Epidemiology of Fungus Diseases. Dr. Isaac Muende: Treatment of Fungus Diseases.
British Orthopædic Association
10.30 P.M. (Queen's University, Belfast.) Prof. George Perkins: Painful Shoulder.
2 P.M. (Whitla Medical Institute, Belfast.) Short papers.
Honeyman Gillespie Lecture
5 P.M. (Edinburgh Royal Infirmary.) Mr. Joe Pennybacker: Intracranial Tumours in the Aged.

Friday, 22nd

West London Medico-Chirurgical Society
8.30 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Dr. W. S. C. Copeman: West London Worthies—a Retrospect. (Presidential address.)
Middlesex County Medical Society
3 P.M. (Hillingdon Hospital, Uxbridge.) Miss J. Morgan: Report on 450 Cæsarean Sections. Mr. K. S. Mullard: Carcinoma arising in Segmental Bronchi.
British Orthopædic Association
9.20 A.M. (Whitla Medical Institute, Belfast.) Short papers.
11 A.M. Mr. S. A. S. Malkin: Presidential address.
2 P.M. (Royal Victoria Hospital.) Clinical demonstrations.

Saturday, 23rd

Nutrition Society
10.30 A.M. (Royal Society of Arts, John Adam Street, W.C.2.) Discussion on Anti-vitamins in Food.
Biochemical Society
11 A.M. (London School of Hygiene, Keppel Street, W.C.1.) Symposium on Partition Chromatography and its Application to Biochemical Problems.
British Orthopædic Association
9.20 A.M. (Whitla Medical Institute, Belfast.) Short papers.

Notes and News

MEDICAL RECRUITS

The Central Medical War Committee has been infor that, on the recommendation of the Medical Priority C mittee, the Minister of Health, with the concurrence of Secretary of State for Scotland, has decided that the em gency arrangements under which a young practitioner li for military service is recruited after six months' tenure o "A" post will cease at the end of October. Young pr tioners completing their tenure of "A" posts on or Nov. 1, and selected for appointment to "B2" posts, wi granted deferment of call-up in accordance with the re tions in operation before the introduction of the emerg arrangements last July.[1] Hospital authorities are t informed by circular letter of this change in proce There is, however, no change in the arrangement under w *young practitioners approaching the age of 26 on qualifi* are recruited before their 26th birthday, even if this prevent their completing an "A" post or occupyin "A" post at all.

THE TEAM SPIRIT IN HOSPITAL

In an address opening the new session of the Royal Hospital, London, on Oct. 1, Mr. L. E. C. Norbury, s *surgeon to the hospital and a vice-president of the* F College of Surgeons, spoke on the importance of team-w In a hospital, he said, the work of each department is a n to a common end, and each department is an essential in the team. On entering the medical school the st is initiated into the team, and the team spirit shoul inculcated from the earliest days—though the proces initiation may be unexpected and something of an or

In Mr. Norbury's opinion more use should be made o services of professors and teachers of the preclinical sub as members of the team, in discussions and demonstrat He recalled a series of lecture-demonstrations, held years ago at the Royal Free, in which clinical and precl teachers dealt with the subject from their particular a "To my mind such a discussion by various members team, and the pooling of knowledge, is of far greater pra value to all concerned than a stereotyped lecture. pendulum is already swinging in this direction, and I forward to the day when the old formal series of lecture be replaced entirely by lecture-demonstrations along lines indicated. It is the practical application of know which should be instilled into the mind of the student. textbook can be studied at home and at leisure."

In a properly conducted team there must be com service and common loyalty, and in arriving at a satisfac plan of campaign there must be discussions and consultat with free expression of opinions. Such cultivation of team spirit was essential for progress in medical sci In a recent speech Mr. Herbert Morrison had said: "I could bring into every factory and mine and farm and w shop the spirit and enthusiasm that the ordinary man bro to team games half our troubles would be over," and t sentiments, Mr. Norbury believed, could usefully be ap to medicine. In a well-appointed team there must, more be time for relaxation and social enjoyment: its mem must "work in harmony both socially and intellectuall order to produce the optimum results."

PHARMACOLOGICAL RELATIONSHIPS

The Society of Chemical Industry has formed a chemicals group, and at the first meeting, held in Lo on Oct. 5 with Sir Jack Drummond, F.R.S., in the chair inaugural address was delivered by Dr. J. H. Burn, F professor of pharmacology in the University of Oxford. said he had always believed that the university wo should be willing to assist industrial laboratories if he co as a matter of public service. One of the contributions m by university pharmacological laboratories to advance in fine chemical industry was the introduction of method biological standardisation, and tribute was due to Sir He Dale in gaining acceptance for the principle of compara methods and of the necessity for international standa

Another contribution, he said, stemmed from the clas work of Dale and Laidlaw, and their chemical colleagues G Barger and Ewins, on adrenaline and sympathomim

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[1] See *Lancet*, 1948, i, 930, 971.

MENINGOCOCCOSIS

A PROTEAN DISEASE*

H. STANLEY BANKS
M.D. Glasg., F.R.C.P., D.P.H.
SICIAN-SUPERINTENDENT, PARK HOSPITAL, HITHER GREEN

RECOGNITION of the protean nature of infections is y slow. The dominant clinical form may long be ought of as the complete disease. In most cases the cept soon becomes widened by inclusion of the more viously related clinical forms; but it is only after tracted clinical observation and laboratory study t the rarer forms are revealed in their true relation the disease complex. This ever-widening conception disease has long been familiar in tuberculosis and ilis. We are witnessing it today in glandular er and poliomyelitis. I think it is no less true of ningococcal disease.

Cerebrospinal meningitis," "epidemic meningitis," d "cerebrospinal fever" are terms representing successive expansions of the idea of this disease. The aterhouse-Friderichsen syndrome and scattered cerebral ppuration represent later accretions. Chronic meningocal septicæmia was firmly added only during the late The encephalitic forms, the hæmorrhagic and nonmorrhagic adrenal forms, the pituitary and other tastatic lesions are all comparatively recent concep. "Cerebrospinal fever" is a designation no longer quate for the disease as a whole. "Meningococcal ase" is an inclusive term but somewhat colourless. protean nature of the disease and its broad pathology n to justify "meningococcosis" as a generic name for forms of the disease on the analogy of tuberculosis, dinosis, and the like.

The basis of these lectures is a series of 706 consecutive admitted to the Park Hospital between Jan. 1, and June 30, 1947, a period of stabilised treatment the more active sulphonamides, and, in the later with systemic penicillin in a few selected cases. treatment was not used in any case, having been rejected as unnecessary during the experimental period of chemotherapy in 1937–38.

The series is mainly a civilian one of the usual varied age-distribution from infancy to over 70 years of age, but contains a number of Service cases which slightly overload the young adult groups. This is balanced, however, by the higher than normal incidence of older persons admitted during the war and the evacuation, when many young persons were absent from London. The period includes pre-epidemic, epidemic, and post-epidemic phases. The greatest pressure of the epidemic phase came in the first four months of 1940, when 120 patients were admitted, of whom 12 died, 6 being infants —a case-fatality rate of 10%. This is somewhat higher than the case-fatality rate for the whole period (7·36%).

TABLE I—RESULTS IN 706 CONSECUTIVE CASES OF MENINGOCOCCAL DISEASE ADMITTED TO PARK HOSPITAL 1939–47

Age-group (years)	No of cases	No. of deaths	Fatality-rate (%)
0–1	76	18	23·7
1–2	43	2	4·6
2–3	47	2	4·2
3–4	45	3	6·6
4–5	31	2	6·4
5–15	90	3	3·3
15–25	171	6	3·5
25–35	92	5	5·4
35–45	45	4	8·8
45–55	36	2	5·5
55–65	19	2	10·5
65–75	11	3	27·2
Total	706	52	7·4

It should be noted that no case has been excluded from the series, even though the patient was moribund on admission.

Table I shows the age-incidence and fatality in single years up to 5 years of age, and in ten-year periods thereafter. This illustrates some general principles of the epidemiology of the disease: (1) there are far more cases in infants under a year than in any other single year of age; (2) incidence declines with age, except for the period 15–25 years, which contains more cases than the previous decade; (3) after the age of 35 there is a sharp drop, and after the age of 55 another and still sharper drop in incidence; and (4) case-fatality rates are high only at the extremes of life, the curve of mortality from infancy to old age being cup-shaped, with its lowest level between 15 and 25 years.

Fig. 1 shows the curves of notifications of cerebrospinal fever during 1936–45 and indicates the general epidemiological background of the series. The years 1940–42 were the epidemic years, each with a characteristic peak incidence in March. In the later years there was no well-defined peak but about twice as many cases in the first half of the year as in the second, a form of curve resembling that of the prewar years but two or three times as high, both in winter and in summer. The force of the 1940–42 epidemic did not in fact expend itself until about June, 1947.

ORDINARY FORM

The habitat of the meningococcus is the nasopharynx, where the organism mostly leads a saprophytic or semi-saprophytic existence. Meningococcal infection of the nasopharynx is mainly subclinical. Under exceptional conditions the organism becomes invasive and finds its

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* Milroy lectures to the Royal College of Physicians for 1945. Deferred because of the author's service overseas.

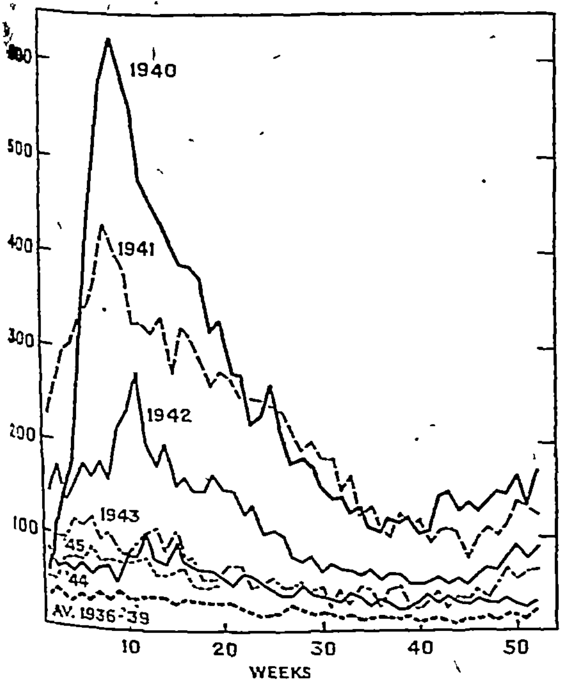


Fig. 1—Weekly notifications of cerebrospinal fever

Planning Forum

The autumn series of lectures to be held in the Planning Centre Hall, 28, King Street, Covent Garden, London, W.C.2, includes discussions on the Kinsey Report by Mr. David Mace, PH.D., Dr. Fred Grundy, and the Rev. J. Leycester King (Oct. 27); on Population and Emigration by Dr. David Glass, Prof. Brinley Thomas, and Mr. R. J. Goodman (Nov. 11); and on Work and Health by Dr. R. S. F. Schilling, Mr. Brian Bunch, A.R.I.B.A., and Dr. John Burton, with Prof. J. M. Mackintosh in the chair (Nov. 24). The lectures are held on the fourth Wednesday and second Thursday in each month at 6.15 P.M., and further particulars may be had from the centre.

S.M.A. on Health Centres

The council of the Socialist Medical Association has passed a resolution which welcomes the recognition by the council of the British Medical Association of the need for health centres, and continues:

> The Socialist Medical Association supports the urgent demand put forward for an experimental trial of different types of health centre in varying areas, but is strongly opposed to the view that widespread development of health centres should not be commenced until after such experiments are completed. The further development of general practice depends on health centres, and these, in accordance with the Act, must be set up and properly equipped by the local health authorities, and not left to individual groups of practitioners whose association would not be under democratic control.

Minister on Health Service

On Oct. 7, addressing the first annual meeting of the Executive Councils' Association (England) of the National Health Service, Mr. Aneurin Bevan, Minister of Health, again appealed to the public to use the service prudently, intelligently, and morally; he described it as a test of the maturity of the British people. As reported in the *Times*, he went on to speak as follows of the general practitioner's responsibility. "Over-prescribing can be as bad as under-prescribing. Some general practitioners are very conscious of the impressiveness of long lists of drugs in their prescriptions on the psychology of their patients. We want the general practitioner to prescribe what he believes is necessary, and put nothing in his way—but we want to impress upon him that it is not a good thing to evoke merely a psychological response by prescribing too expensive drugs." In the N.H.S., he said, the number of prescriptions is approaching twice what it was under National Health Insurance. At the present rate over 140–150 million prescriptions would be dispensed annually.

On Oct. 6 the Minister of Health met the chairman of boards of governors of teaching hospitals, regional hospital boards, and hospital management committees. This was in response to a personal invitation from the Minister, who is anxious to make regular contact with as many as possible of those who now share responsibility for running the National Health Service. Mr. Bevan stressed that their responsibility lay, first and foremost, with the patient, and this must never be forgotten or overlooked.

Cambridge Graduates Medical Club

This club held its annual meeting at Downing College on Oct. 6. Presiding over some 65 members at the dinner, Mr. W. H. C. Romanis recalled that from 1930 until the war the club met once a year at Cambridge. Sir Lionel Whitby, master of Downing and regius professor of physic, who was the principal guest, said that the club's function was mainly social: it provided an opportunity to revisit Cambridge and meet old friends. While Oxford had become an industrial city, Cambridge remained an overcrowded market town, without the advantages or the disadvantages of wealth. The medical school, full to overflowing, was incomparably more difficult to enter than in "our day," and the examinations were so much more difficult that he was glad to be on the right side of the table. The main innovation was the institution of a postgraduate school. Having secured recognition of Addenbrooke's as a teaching hospital, the next task had been to develop departments specially appropriate to Cambridge—first in radiotherapeutics (associated with physics) and in experimental medicine (associated with physiology and biochemistry). The new department of human ecology was not only making epidemiological and statistical studies of the peculiar problems of the fenland but had also undertaken the preventive medical care of undergraduates. He h in due course to see departments of pædiatrics ar hæmatology. The policy adopted was to take one step time, obtaining funds through normal channels. It rem to be seen whether Cambridge would ever have a full u graduate medical school; but certainly it could not till Addenbrooke's was rebuilt—for which there were sch involving a 100-acre site and 1200–1500 beds. In concl Sir Lionel Whitby spoke of the difficulties to be expect the scale of academic salaries remained at its present so low in relation to the rewards to be expected in ordinary specialist practice.

Colonial Medical Research Studentships

The Secretary of State for the Colonies has institu limited number of these studentships for graduat medicine and cognate sciences, who wish to prepare t selves for research work in tropical medicine and re subjects. It is the intention that students satisfact completing their courses shall be offered posts in the pro Colonial Research Service. Application should be r through the head of the candidate's department, tc Secretary, Colonial Medical Research Committee, c/o Res Department, Colonial Office, Sanctuary Buildings, Great S Street, London, S.W.1.

Dr. D. J. A. Alban-Jones has been awarded scholar by the Belgian and Netherlands governments throug British Council to study obstetrics and gynæcology. He work at the Hôpital St. Pierre in Brussels for eight mo and he will then spend four months in Amsterdam.

Following representations by the Medical Defence U Messrs. Silten Ltd., the manufacturers of 'Leucotr have expressed regret that a pamphlet advertising product quoted from a book by Prof. L. S. P. Davidson Dr. J. J. R. Duthie, without authority and in such a as to give the impression that these authors advocate use of leucotropin and had composed the pamphlet.

British Drug Houses ask us to state that free copies of *Guide to the B.P. 1948* will be sent to doctors who app their offices at Graham Street, City Road, London, N.1.

Births, Marriages, and Deaths

BIRTHS

CANE.—On Oct. 4, in London, the wife of Dr. C. S. Cane—a

CUMMING.—On Sept. 30, in Edinburgh, the wife of Dr. R Cumming—a son.

FRANKLIN.—On Oct. 4, in London, the wife of Dr. John Fra —a daughter.

GINSBORG.—On Oct. 4, in London, the wife of Dr. S. Ginsbo a son.

HART.—On Oct. 5, in London, the wife of Dr. F. D. Har daughter.

LANE.—On Oct. 7, the wife of Dr. Roger Lane—a daughter.

ROBINSON.—On Oct. 2, at Slough, Bucks, the wife of Dr. A Robinson—a son.

ROGERS.—On Oct. 7, in London, the wife of Dr. John Roger daughter.

RUSSELL.—On Oct. 5, at Nottingham, the wife of Dr. Ma Russell—a son.

SWINNEY.—On Aug. 28, in Albuquerque, New Mexico, the wif Mr. John Swinney, M.C., F.R.C.S.—a son.

MARRIAGES

HEWLETT—BARRACLOUGH.—On Sept. 29, at West Byfleet, He Reynardson Hewlett, lieut.-commander, R.N., to Patr Mary Barraclough, M.B.

DEATHS

DINGLE.—On Oct. 2, Frederick Robert Dingle, M.R.C.S.

HANNAY.—On Oct. 5, in London, Robert Strickland Hann C.B., C.M.G., D.S.O., L.R.C.P.E., major-general, late R.A. retd, aged 77.

HEMSTED.—On Oct. 7, at Kintbury, near Newbury, Berks, Edm Spencer Hemsted, M.R.C.S., aged 78.

MCCARTHY.—On Oct. 3, at Sidmouth, John McDonald McCart M.B. Camb., colonel, R.A.M.C. retd, aged 75.

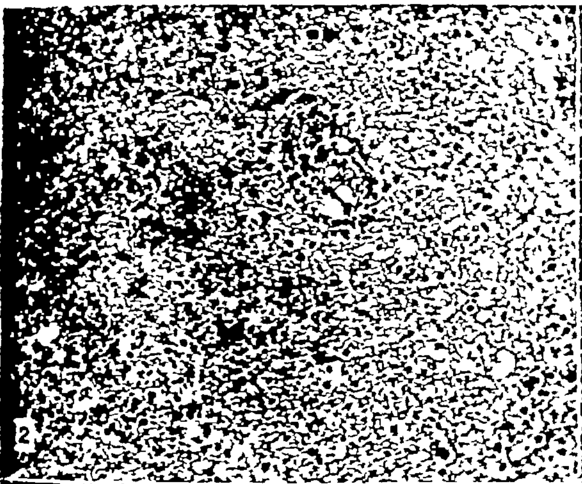
MALCOLM.—On Oct. 6, in Edinburgh, John Wright Malcolm, O.B. M.C., M.B. Edin., lieut.-colonel, R.A.M.C. retd, aged 56.

PORTER.—On Oct. 4, at Bristol, Charles Porter, M.A. Oxfd, M.R.C

ROBERTS.—On Oct. 7, in London, Alexander Boyd Robert M.D. McGill.

STEPHENS.—On Oct. 8, at Newquay, Cornwall, William Jo Stephens, M.R.C.S., aged 82.

WESTERN.—On Oct. 5, at Chalford Hill, Stroud, George Tre Western, B.A., M.D. Camb.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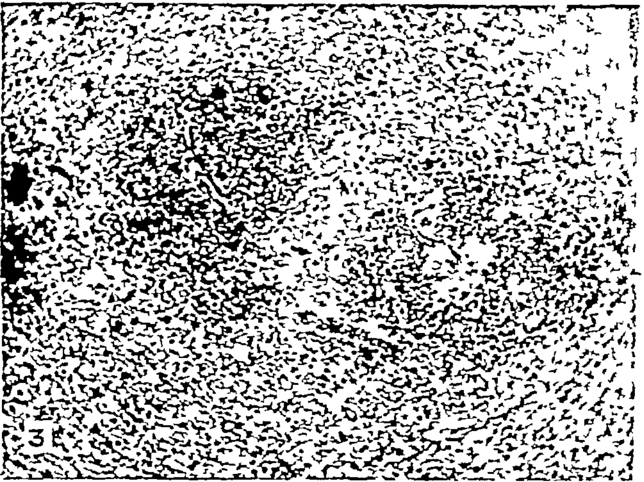
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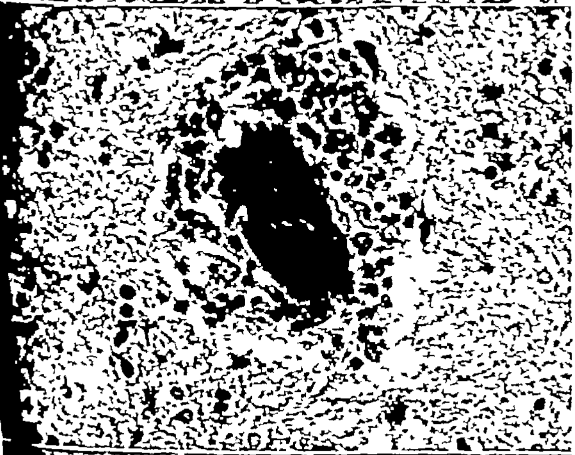

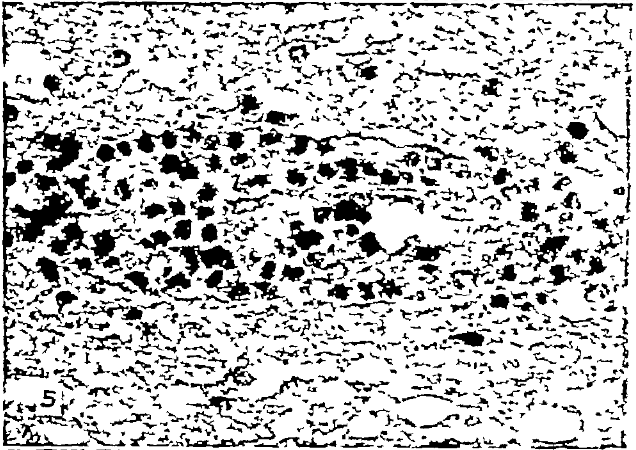
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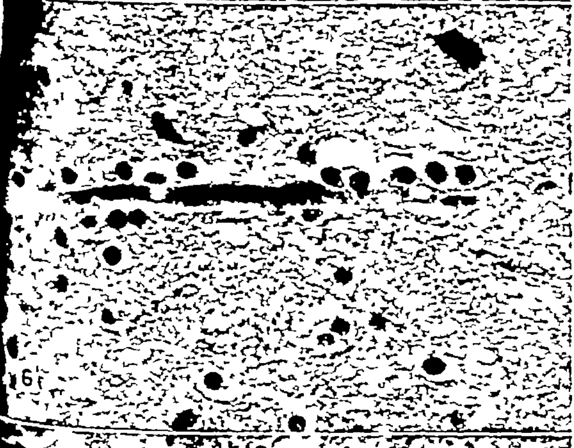
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way into the blood-stream and meninges to produce the ordinary form of the disease. This is especially liable to happen with group I strains during an epidemic and with group II strains in infants. Such activity is preceded or accompanied by overt nasopharyngitis in about a third of the cases, but the rôle of the meningococcus in the production of this nasopharyngitis is uncertain, since the common organisms of the upper respiratory tract obscure the picture. A few instances have, however, been recorded of pure cultures of meningococcus in tonsillitis (van Rooyen and Morris 1941), and in nasopharyngitis (Allison 1947). Irrespective of the presence or absence of clinical nasopharyngitis, the same type of organism as that in the spinal fluid may be isolated from the nasopharynx within a day or two of onset of symptoms and it usually then disappears (Flack 1917).

The sequence of events in the ordinary form of the disease is generally held to be: (1) nasopharyngeal infection (usually subclinical); (2) bacteriæmia; and (3) meningitis. Fairbrother (1947) revived the older theory of direct infection of the meninges from the nasopharynx via perineural pathways. This theory is difficult to reconcile, however, with the numerous proved cases of premeningitic meningococcæmia in fulminating and ordinary forms and with ameningitic chronic meningococcal septicæmia. It must be admitted that the exact mechanism by which the organism passes into the blood-stream from the nasopharynx is unknown. Clinical histories and routine blood-cultures suggest that the premeningitic bacteriæmia is usually short—a matter of minutes or hours in the ordinary form. In rare cases it has been observed for two or three days. A papulo-petechial rash is present at this stage in 25–50% of the cases.

The ordinary form is encountered in fully 90% of all clinical cases in epidemic times and probably over 95% in non-epidemic times. It is so well known that it need receive no further attention here. I wish to deal more particularly with the rarer forms of the disease, some of which are less easily recognised and differentiated. Recognition of these syndromes is important in our understanding of the disease, and their early diagnosis is of the utmost importance in treatment.

CHRONIC MENINGOCOCCAL SEPTICÆMIA

Though the chronic septicæmic form was first described as early as 1902 it received little attention until the epidemic of 1940–42, when numerous cases were observed among British troops in France and in the civilian population of Great Britain. It still crops up occasionally, especially in the meningococcal season. It should be borne in mind in all states of intermittent pyrexia accompanied by crops of spots. The clinical picture is usually very characteristic: (1) bouts of pyrexia every two or three days with or without rigors and sweating, sometimes suggesting malaria; (2) recurrent crops of papules, sometimes with petechial centres, on trunk and limbs; (3) raised circular erythematous areas resembling erythema nodosum; and (4) occasional rheumatic accompaniments in the form of pains or swelling of joints, and pains in muscles, tendons, fasciæ, and bones. Priest (1947) described one case with febrile bouts extending over several months in which there was no rash. An attempt should be made to confirm the diagnosis by blood-culture, but this may be negative, even after repeated attempts, in 25–50% of the cases. In pre-sulphonamide days the condition sometimes lasted for months or even years before burning itself out or ending in meningitis. It gets little chance to do so now, for even a few doses of sulphonamides end the condition at once.

ACUTE DIFFUSE ENCEPHALITIC SYNDROME

In severe cases of the ordinary form the patient is often stuporous or semicomatose but resents, and sometimes violently resists, any attempts to treat disturb him. In contrast with this common picture is the relatively rare development, early in disease, of deep coma, associated with complete of response to gross stimuli, such as pinching and pullin the patient about in bed. Even reflex swallowing may b absent, but this is unusual. Most of these cases the ordinary form for 24 hours or so and then into deep coma suggesting a rapid increase in intra pressure. Breathing is laboured or stertorous. involvement is indicated by extensor plantar reflexes, and by pareses. A slight papillœdema is commo There is some stiffness of the neck and back associate with the purulent meningitis, but otherwise the musc may be flaccid. A petechial eruption, usually scanty, may be present, or there may be no rash. Response sulphonamide treatment is negative or very slow, the condition being often fatal in three to seven days return of consciousness.

In the absence of any other cause of coma, such that associated with glycosuria with severe ket or concurrent true diabetes, this clinical syndrome the "acute fatal type" of the older writers. Banks an McCartney (1942) found, in some of these cases, chara teristic histological lesions in the brain and cord whi might be correlated with the deep coma and oth clinical symptoms, and described such cases as the "acu diffuse encephalitic syndrome."

In my series of 706 patients there were 13 consider to belong to this category, of whom 6 recovered a 7 died. Only 4 of the fatal cases could be investigat histologically, but in all 4 the characteristic lesio were found in the brain and cord, varying in according to the duration of the comatose state. Th lesions consisted not only of congestion and œdema b also of widespread thrombosis in, and hæmorrha around, small vessels and of perivascular leucocyt infiltration, sometimes with gross deposition of fibr Purulent meningitis was always present, but this usually clearing or had almost cleared as a result of sulphonamide treatment. In the 2 more protracted cas the perivascular leucocytic infiltration amounted places to dense zones of polymorphs, suggesting that a abscess was beginning to form. Besides these vascular and perivascular lesions there were also deg erative changes in the neurone cells. The lesions we diffusely spread in the brain stem, cerebral hemisphere cerebellum, and cord (figs. 2–6).

It is somewhat surprising that little confirmato evidence of this syndrome has, to my knowledge, sinc been published, except a typical example by Wartma and Hænger (1944), who, using Spielmeyer's myelin stain showed that the pale areas around the hæmorrhagic fo in the brain were due to displacement of the myelinate nerve-fibres, *and that there was no primary* demyelinatio They point out that the absence of demyelinatio

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LEGENDS TO ILLUSTRATIONS

FIGS. 2 TO 9

Fig. 2—Acute diffuse encephalitic syndrome, 5th day: hæmorrhag and thrombosis with perivascular infiltration in cerebrum. (× 15

Fig. 3—Acute diffuse encephalitic syndrome, 5th day: multiple hæm rhages in cerebrum. (× 140.)

Fig. 4—Acute diffuse encephalitic syndrome, 5th day: with perivascular infiltration in cerebrum. (× 290.)

Fig. 5—Acute diffuse encephalitic syndrome, 4th day: thromb with polymorph and mononuclear *infiltration* in cerebrum. (× 61

Fig. 6—Acute diffuse encephalitic syndrome, *early* 3rd day: œdem and thrombosis with *early* perivascular infiltration in cerebr (× 580.)

Fig. 7—Fulminating encephalitic syndrome, early 2nd day: with commencing perivascular infiltration in cerebrum. (× 400.)

Fig. 8—Fulminating adrenal syndrome: *moderate hæmorrhage* necrosis and "tubular lesions" in adrenal cortex. (× 610.)

Fig. 9—Acute focal encephalitic syndrome: *focal hæmorrhages* in brain associated with death from *subdural hæmorrhage*. (× 110.)

Adrenal Type

This syndrome is represented in the series by 13 ts of whom 8 died and 5 recovered. There were infants under 1 year, 6 children aged 1–6 years, and ults aged 19–34. All 3 infants died, but 4 children l adult recovered. The diagnosis in the recovered could, of course, only be presumed from the ptoms.

The main symptoms in this syndrome were a sudden t of fever, with fretfulness or malaise, and the rapid arance of a generalised petechial rash, which soon e purpuric. In most cases the purpura became ve, and large cyanotic areas could also be seen in skin. With the development of purpura, peripheral tory failure set in, the blood-pressure being low unrecordable. Meningococci were present in blood- e and often in films of the peripheral blood. Signs eningitis were generally absent on first examination tended to appear later. In contrast with the phalitic type the mental state was clear almost to end. The cardinal signs of the syndrome were the ive purpura, the low blood-pressure, and the clear tal condition, all associated with an overwhelming ticæmia.

At necropsy the brain and meninges showed little e than congestion; the most conspicuous lesions e found in the suprarenal glands—usually bilateral orrhage of various degrees, starting in the inner reticular layer of the cortex, but often extending rds to the medulla and outwards almost to the phery of the cortex, so that much of the gland was troyed. When the hæmorrhage was massive, some of large medullary veins might be thrombosed. Many the cortical cells were out of alignment and showed nerative changes and even necrosis. This was easily seen in the actively functioning outer or erular layer of the cortex.

ks and McCartney (1943) published illustrations ous types of hæmorrhagic adrenal lesions, from the stage to massive hæmorrhage accompanied by osis of venus sinuses and complete destruction gland. Some of the intermediate types showed ly hæmorrhage but also well-marked degenerative ges in the cortical cells. The same workers, however, illustrated non-hæmorrhagic adrenal lesions which t be associated with severe adrenal dysfunction. e included gross degeneration of cells of the erular cortex with complete disorganisation of the cture of the cortical cords, as well as gross œdema of whole gland and foci of leucocytic infiltration tered through the gland. One of these photomicro- phs is reproduced here (fig. 8). It shows degeneration necrosis of cells of the glomerular layer in addition some hæmorrhage. In this section the "tubular ons" described by Rich (1944) can also be seen. The d cords of the cortex have been converted into tubes taining fibrinous exudate from the capillaries as ll as much cellular debris. Rich showed that the mary lesion in such cases was necrosis of the hormone- taining cortical cells, and that their death and orption allowed exudate from the capillaries to flow o the centre of the cortical cords, dissecting them for variable part of their length into "tubes." Such ons represent a gross interference with adrenal ction and may be present without hæmorrhage.

Another non-hæmorrhagic adrenal lesion is shown in . 10. This specimen is from a child of 5 years who died fulminating meningococcal septicæmia of adrenal pe nineteen hours after the appearance of the purpuric uption. It shows a band of fibrin 3 mm. thick rrounding the gland. This layer of fibrin covered the eater part of both glands. Sections of the suprarenal lands in this case showed only slight hæmorrhage but vere toxic changes in the cortical cells. The thick band of fibrin might have hindered absorption of hormonal secretion.

Such lesions may help to explain those cases which present the signs of fulminating septicæmia of adrenal type, including peripheral circulatory failure during life, but show no adrenal hæmorrhage after death. Absence of gross adrenal hæmorrhage has led some observers—e.g., Williams (1942)—to consider that undue importance has been ascribed to adrenal apoplexy as a cause of the circulatory collapse. It appears, however, that the non-hæmorrhagic microscopic lesions in the suprarenal glands may have been overlooked in some at least of these observations. Kinsman et al. (1946) demonstrated gross degenerative lesions in the cortical cells in 2 cases of this syndrome in which adrenal hæmorrhage was absent. They advanced the theory, based mainly on Rich's work, that the increased demand on the adrenal cells, as a result of the fulminating infection, depletes the cortical cells of lipoid or hormone-containing material. The cells degenerate rapidly, undergo lysis, and shrink, causing loss of support to the capillaries. Up to this point the damage may still be reversible, and efficient chemotherapy of the infection may save the patient. On the other hand, the patient may die from the functional damage or other factors before hæmorrhage takes place. In most fatal cases, however, the cortical capillaries rupture, owing to loss of support and possible weakening of their walls by toxic action. If the resulting hæmorrhage is gross it causes irreversible damage to the gland.

Fig. 10—Fulminating adrenal syndrome: periadrenal thick fibrinous exudate.

This theory seems to indicate at least one important cause of the circulatory failure in fatal cases of the adrenal syndrome in which hæmorrhage is not found, and also in recovered cases. It does not exclude the part played by toxic effects on many other organs and tissues—e.g., heart, vessels, and vasomotor mechanism; but it emphasises and explains the predominant part played by adrenal lesions. The latter include, in some cases, thrombosis of the large medullary venous sinuses along with gross hæmorrhage and necrosis, a condition which has been described as thrombotic necrosis. If the above theory is correct this term would merely describe the end-result and not necessarily the sequence of events, since the cortical necrosis might precede the thrombosis.

In my series all the fatal cases considered clinically to belong to this syndrome revealed hæmorrhagic or non-hæmorrhagic adrenal lesions which might be considered significant. Accordingly, without denying that the general vascular or other toxic lesions may play a part in the production of circulatory collapse, I consider that the correlation of symptoms with adrenal lesions is sufficiently striking to justify designation of this syndrome as "fulminating septicæmia of adrenal type," or, more briefly, "fulminating adrenal syndrome."

(3) *Mixed Encephalitic-adrenal Type*

In this syndrome early deep coma is combined with a purpuric rash and low blood-pressure. At necropsy both the brain and the suprarenals exhibit lesions of the kinds already described for fulminating septicæmia of encephalitic and of adrenal types. In my series there were 5 cases of the mixed syndrome, all fatal: 3 in infants and 2 in children aged 4 and 8 years.

distinguishes this disease from acute hæmorrhagic leucoencephalitis (Baker 1935) and other rare primary demyelinating diseases. Cases can easily be missed at necropsy if the brain and cord are not carefully examined histologically at all levels. I discovered, when I referred back to my pre-1939 cases, that, of 6 cases which clinically might have belonged to this syndrome, brain sections had been preserved only in 1, which on re-examination showed the typical lesion. Photomicrographs of brain sections of the 2 most protracted cases were shown in the original paper (Banks and McCartney 1942). Figs. 2, 3, and 4 show additional brain sections from 1 of these patients, a man of 22 who died on the fifth day of the disease after three days of deep coma. Fig. 5 is a section from another patient, a man of 24 who died on the fourth day of disease.

Though clinicopathological correlation seems fairly clear in such cases, it is naturally less clear in cases that are fatal within three days or less of the onset of the acute illness. I have examined 2 examples of this more acute type in a child of 2 and a man of 45 years. The man died after twenty-five hours' deep coma. The duration of the acute illness was not exactly determined but was probably about forty-eight hours or a little more. In this case sections of cortex, basal ganglia, mid-brain, and medulla all showed diffuse capillary thrombosis, with, here and there, slight perivascular round-celled infiltration limited to a single ring of cells (Banks and McCartney 1942). Fig. 6 is an additional section from this case and shows capillary thrombosis with slight round-cell perivascular infiltration. The lesions here are intermediate between those of the 2 more protracted cases referred to above and those of a fulminating encephalitic case to be described later.

Supporting evidence of the diffuse encephalitic basis of this syndrome is obtainable from recovered patients. In the original paper (Banks and McCartney 1942) we described the case of a girl of 15 with meningococcal meningitis who was in absolute coma for three days and then slowly emerged, becoming rational, but with very slow cerebration, after five days' intensive sulphonamide treatment. During early convalescence she had a mask-like expression, which lasted three weeks. She also had an upper-neurone facial paresis as well as a lower-neurone bilateral sixth-nerve paralysis. The combination of protracted deep coma, transient parkinsonism in convalescence, and upper-neurone involvement, when considered with the pathological data already demonstrated, more than suggests a widespread parenchymatous lesion in the central nervous system.

FULMINATING MENINGOCOCCAL SEPTICÆMIA

Meningococcal septicæmia is sometimes overwhelming and fatal in from as little as four hours from onset to forty-eight hours. Meningitis in such cases is a relatively negligible factor; it is usually absent or just beginning before death or recovery.

It is an old observation that a broad distinction can be drawn clinically between two kinds of fulminating meningococcal septicæmia: that in which the brunt of the onslaught is on the central nervous system, and that in which it is on the peripheral circulation. We have tried to demonstrate a correlation of the first type with the lesions in the brain, minimal as they must be in such a rapidly fatal infection, and of the second type with lesions in the suprarenal glands. We found, however, in a considerable proportion of cases, that both of these systems were involved, giving rise to a mixed clinical syndrome which is confusing, and has actually been confused in the so-called Waterhouse-Friderichsen syndrome (Banks and McCartney 1943).

There are other sources of confusion too in this medley of fulminating meningococcal septicæmia. There is evidence that the pituitary gland is occasionally involved (see below). Again, Morison (1943), on the basis of necropsies on 3 cases with adrenal hæmorrhage, thought that the evidence favoured a generalised vascular lesion leading to peripheral circulatory failure or shock symptoms by the usual mechanism of plasma loss from the circulation. He and others—e.g., Williams (1942)—consider that the lesions in the suprarenals play a relatively insignificant part compared with the genera toxic lesions in the production of the symptoms of peripheral circulatory failure. Against this view, however must be placed many observations indicating that the shock of severe acute infections has a different origi from that associated with trauma or hæmorrhage. Ebert and Stead (1941), for example, showed that the peripheral circulatory failure in 8 cases of severe acute infections was not associated with a decrease in the volume of the plasma or with any other laboratory test of hæmoconcentration. Moreover, it was not altered by transfusion of plasma or blood. To my knowledge hæmoconcentration has not actually been demonstrated during life in fulminating meningococcal septicæmia. shall return to this point again; meanwhile I suggest that sufficient correlation between organic damage and clinical symptoms has been demonstrated to justify th classification of fulminating meningococcal septicæmi into three broad types: (1) encephalitic; (2) ad (this might be understood to include occasional pituitary lesions); and (3) mixed or encephalitic-adrenal. Such classification has at least the advantage of suggesting treatment appropriate to the type.

I deprecate the use of the term "Waterhouse-Friderichsen syndrome" for cases of fulminating septicæmia with massive purpura and bilateral adren hæmorrhage, because this syndrome seems to be composite affair which includes both the "pure adrenal" and the "mixed" syndromes, and so leads to confusion of symptomatology and of treatment. I think it particularly important to distinguish between cases which the patients are comatose from an early stage and those in which they are mentally clear. This is not done in the Waterhouse-Friderichsen syndrome, but it is cardinal distinction in our classification.

(1) *Encephalitic Type*

This is represented by 6 cases in my series of 706 cases of meningococcal disease: 2 in infants, 2 in children o 3 years, and 2 in young adults. All were fatal within forty-eight hours of onset. All of them were acute medical emergencies. Onset was sudden, with anorexia vomiting, and fever. Lethargy, stupor, and then absolute coma rapidly developed, accompanied by laboured a stertorous breathing. A petechial but not massive purpuric rash appeared within about 12–18 hours o onset, and meningococci were found in the blood. I infants convulsions occurred. The plantar reflexes were extensor. Blood-pressure was normal.

At necropsy the brain was grossly congested and œdematous, and sometimes as much as 50% overweight Sections at various levels showed early purulent meningitis, and in the parenchyma diffuse capillary thrombosis small hæmorrhages, and some degeneration of neurone cells. No adrenal or other conspicuous lesion was apparent.

Banks and McCartney (1942) published brain sections from an infant of 11 months who died after thirty-six hours' illness, including ten hours' complete coma These showed capillary thrombosis, slight perivascular infiltration, and capillary hæmorrhages. Fig. 7 is another section from the same case, showing capillary thrombosis and slight perivascular infiltration. The lesions, as would be expected, are minimal but may be interpreted as a very acute encephalitic basis for the deep coma which is the cardinal sign of fulminating meningococcal septicæmia of the encephalitic type.

INFECTION BY PENICILLIN-RESISTANT STAPHYLOCOCCI

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ANY studies have been carried out on the incidence penicillin-resistant strains of *Staph. pyogenes* in cases nfection. Until 1944 few such strains were encountered. e then, however, the incidence has been increasing idly, particularly in hospitals. Studies in which e than 10% of all strains tested were found to be stant to penicillin have been recorded by Spink et al. 44), Bondi and Dietz (1945), Gallardo (1945), Plough 45), Harley et al. (1946), Barber (1947a and b), and pson (1947). In a previous report one of us (Barber 7b) showed that in less than a year the incidence penicillin-resistant strains of *Staph. pyogenes* giving to infection in this hospital had gone up from 14·1 38%. The work reported here shows that this rease is continuing.

All pus swabs received in the laboratory during this estigation have been plated directly on to plain blood-agar es and penicillin-ditch plates, the ditch containing 10 units penicillin per ml. of agar. If other specimens from cases fection yielded a heavy growth of *Staph. pyogenes*, this th was emulsified in broth and replated on a penicillin- h plate. All staphylococci were tested for coagulase, only those which were positive were included in the series. ny coagulase-positive staphylococci were shown on the h plate to be resistant to penicillin, colonies, usually ten, e picked from a plain blood-agar plate and tested indi- ally for penicillin resistance. All resistant strains isolated e tested for their capacity to destroy penicillin by the hod used in the previous studies (Barber 1947a). Sensi- ty to streptomycin was tested on ditch plates, the ditch aining 100 units of streptomycin per ml. of agar. Part every ditch plate used, whether for testing streptomycin penicillin sensitivity, was seeded with the Oxford phylococcus as a control.

LE I—ANALYSIS OF PATIENTS YIELDING *Staph. pyogenes*

Series	Total patients	Patients with penicillin-resistant strains		
		Total	All colonies tested resistant	Sensitive and resistant colonies isolated
I vember,	99	14 (*14·1%*)	9 (*9·1%*)	5 (*5·1%*
II ry-June,)	100	38	30	8
III ary-June,)	100	59	39	20

ANALYSIS OF RESISTANT STRAINS

Specimens from 100 patients with staphylococcal fection were examined. From 59 patients penicillin- istant strains of *Staph. pyogenes* were isolated; from 9 all colonies tested were resistant, and from 20 both sistant and sensitive strains were isolated. These ults are compared in table I with those of the two evious studies. It will be seen that the incidence of atients yielding penicillin-resistant strains has risen rom 14·1% in 1946 to 38% in 1947 and 59% in 1948. n the present series 20 patients gave mixed cultures of enicillin-sensitive and penicillin-resistant strains. In 17 of these patients the mixture was present in a single specimen, and 8 gave only a few penicillin-resistant colonies. From 3 the first specimen received yielded only penicillin-sensitive staphylococci, but from later specimens penicillin-resistant strains were isolated. These 3 patients will be referred to again in connexion with the source of resistant strains. The results according to type of infection were as follows:

Type of infection	*Total patients*	*Patients yielding penicillin-resistant strains*
Septicæmia	2	2
Boils, abscesses, &c.	23	8
Superficial skin lesions	12	8
Infected operation wounds	12	10
Pulmonary	10	7
Conjunctivitis	22	11
Aural	5	3
Nasopharyngeal	6	5
Umbilical of newborn	3	3
Urinary	3	1
Vaginal	2	1
Total	100	59

The 2 patients with septicæmia both died, in spite of intensive penicillin treatment.

One was a newborn infant in whom the infection appeared to enter via the umbilical cord. The infant had had no penicillin before the infection.

The other was a patient with bilateral cortical necrosis of both kidneys following toxæmia of pregnancy and treated with the artificial kidney. Penicillin treatment was started when the patient was put on the artificial kidney, and maintained after the development of septicæmia. Owing to the kidney deficiency a very high blood-penicillin level was reached, but the infecting staphylococcus was so resistant that it was isolated from a blood-culture while the patient was on a dose of penicillin giving levels up to 8 units per ml. of serum. Though the condition of the kidneys would probably have caused death eventually, necropsy revealed septic thrombosis of one iliac vein and the inferior vena cava, septic infarcts throughout both lungs, and one small abscess in the myocardium.

The cases of abscess were of all grades of severity, and the abscesses were in various sites. The superficial skin lesions consisted of ulcers, gangrene, bedsores, burns, dermatitis, and septic spots. The lung infections included pneumonia, bronchiectasis, lung abscess, and tuberculosis. Of the 22 cases of conjunctivitis 20 were neonatal. Of the 5 patients with aural infection, 4 were children with otitis media, and 1 was an adult diabetic with external otitis.

In view of Voureka's (1948) claim that penicillin-resistant staphylococci can be rendered sensitive by growth in the presence of other organisms, whether the latter are sensitive or resistant to penicillin, the strains in this study have been analysed according to whether they were isolated in pure or in mixed culture. The results (table II) show that 34 of the 59 penicillin-resistant strains were originally isolated from 48 mixed cultures, whereas only 25 penicillin-resistant strains were isolated from 52 pure cultures. The large proportion of penicillin-resistant staphylococci isolated from cultures yielding other penicillin-resistant organisms is interesting, but the figures here are too small to be statistically significant.

TABLE II—ASSOCIATION OF *Staph. pyogenes* WITH OTHER ORGANISMS

—	No. of pure cultures	No. of mixed cultures		
		Total	Other bacteria penicillin-sensitive	Some or all other bacteria penicillin-resistant
Total	52	48	27	21
No. yielding penicillin-resistant strains of *Staph. pyogenes*	25 (*48%*)	34 (*71%*)	18	16

TABLE II—VARIETIES OF MENINGOCOCCAL DISEASE IN THE SERIES OF 706 CASES

Variety	No. of cases	Recovered	Died
Ordinary form	647 *(91·7%)*	632	15
Acute septicæmia only ..	3 *(0·4%)*	3	.
Chronic septicæmia	3 *(0·4%)*	3	..
Acute diffuse encephalitic ..	13 *(1·8%)*	6	7
Fulminating encephalitic ..	6 *(0·9%)*	..	6
Fulminating adrenal	13 *(1·8%)*	5	8
Fulminating encephalitic-adrenal (mixed)	5 *(0·7%)*	..	5
Acute focal encephalitic ..	6 *(0·9%)*	..	6
Chronic form (hydrocephalus)	10 *(1·4%)*	5	5
Total	706	654	52

Occasionally, the pituitary gland may be damaged, as in a fatal case clinically corresponding to the mixed syndrome and showing three areas of coagulation necrosis in the pituitary (Gordon and Shimkin 1943). One of my recovered cases of the adrenal type, a child of normal development at the age of 6 years at the time of the illness (Banks and McCartney 1943), was found at the age of 12 to be suffering from the pituitary form of dwarfism. She had grown only 2 inches in the intervening six years and the ossification of certain epiphyses was delayed.

ACUTE FOCAL ENCEPHALITIC SYNDROME

There still remain some fatal cases of meningococcal disease which do not quite fit into any of the above categories. All workers at this subject have been puzzled, at some necropsies, about the precise cause of death. This was expressed by Thomas (1943) in his description of U.S. Army experiences during the war:

> “Out of 46 cases coming to autopsy 18 had gross adrenal hæmorrhage and in most of the remaining cases the cause of death was not clear. The meningitis was cured or subsiding, and death could only be ascribed to toxic action or increased intracranial pressure.”

Some of these puzzling cases appear to belong at first to the severe ordinary form, and after a day or two they show signs of recovery. This phase, however, is succeeded by sudden or unexpected collapse, convulsions, or coma and death. In some such cases Banks and McCartney (1942) found focal vascular lesions in the brain stem and the cervical cord. The lesions consisted of isolated focal hæmorrhages, hyaline capillary thrombi, swollen capillary endothelium, and slight perivascular infiltration. Often there was also chromatolysis of nerve-cells. In one case the focal lesion had produced a large subdural hæmorrhage. In some cases these lesions were situated close to the vital medullary centres.

We tentatively suggested that such focal encephalitic lesions might explain some of these unexpected tragedies in which the purulent meningitis had practically subsided at the time of death and could not in itself have caused death. Careful histological examination of necropsy material is necessary for the discovery of most of these focal lesions. There were 6 cases in my series, all fatal—1 infant, 1 child, and 2 young and 2 middle-aged adults. Clinical particulars and brain sections of 2 cases showing focal hæmorrhages have been described (Banks and McCartney 1942). Fig. 9 is a section of the mid-brain from the case of subdural hæmorrhage mentioned above. It shows one large focal hæmorrhage and several smaller ones. Another case in the series was a man of 42 who died on the twelfth day of disease after two successive large cerebral hæmorrhages within twenty-four hours, involving each internal capsule. Up to the ninth day of the dise he had appeared to be a case of the ordinary form.

MILD AND ABORTIVE FORMS

Many cases of mild clinical and subclinical infect undoubtedly occur during an epidemic, especially at tail end of it. The symptoms include mild pyre headache, stiffness of neck and back, and in abort cases they may disappear in a day or two without spec treatment. Other mild cases, however, do not c spontaneously, and the diagnosis may be missed fo week or two, until increasing headache, or contin fretfulness in an infant, compels investigation by lum puncture. Such cases may be extremely dangerous ow to slow formation of arachnoid adhesions, with product of hydrocephalus, subarachnoid block, and someth compression paraplegia.

CHRONIC FORM

The chronic form is a development of the ordin form, generally when the latter has been unrecogni or untreated in the early acute stage. It is referre below. In my series of 706 cases 10 patients had chronic form, of whom 5 died. This form is now m rarer than it was in the presulphonamide days.

MISCELLANEOUS FORMS

Other rare forms of meningococcosis include prim meningococcal ophthalmia, meningococcal hepatitis, meningococcal pneumonia. Some 30 cases of the have been reported, the majority in males so far a known, under the age of 25 years. It is a prim purulent conjunctivitis involving one or both e Corneal ulceration was noted in about a sixth of cases. In about a third there was a history of throat. In no case was the eye permanently dama Meningitis followed in 1 case, and meningoco septicæmia in 2 (Shuttleworth and Benstead 1947).

A case of meningococcal jaundice was reported Crawford (1944) in which jaundice appeared twenty- hours after the onset of a febrile illness and continued ten days concurrently with meningococcal septicæm before it was diagnosed by blood-culture and trea with sulphonamides; the temperature then fell normal in twenty-four hours, and the jaundice appeared a day later. This case closely resembled W disease, but tests for this were all negative.

A considerable number of cases of meningococ pneumonia were reported in the first world war association with the great influenza pandemic (H and Davison 1919). In the second world war only case was reported (Roberg 1945). Subsequently B (1948) reported two cases, one of which was complica by meningococcal empyema. In all these the menin coccus was cultured from the blood or the lung or sputum, and it was not present in the cerebrospinal fl

Table II summarises the varieties of meningococc observed in my hospital series of 706 cases and gi their incidence and fatality rates.

(To be concluded)

“ . . . no matter how great the effort, many epileptics w sooner or later, fail in life's struggle—failure due not to fau of their own but to public ignorance. The enlightenment public opinion is a tough job. A strong national organisati with a whole-time staff and adequate funds, could do mu to change public opinion; *such an organisation would ser the needs of the epileptic in the same way and with the sa force* as the National Institute for the Blind acts for the blin the National Institute for the Deaf for the deaf, and t Diabetic Association for the diabetic. . . . Granted good medi care and a strong national organisation there still remains f epileptics the greatest need of all—regular work.”—*Dr.* P HENDERSON, addressing the Royal Institute of Public Heal and Hygiene on Oct. 20.

the presence of similar organisms. The results are given in table III.

Penicillin-resistant strains of *Staph. pyogenes* were isolated from 2 surgeons and 4 nurses; from 4 of the 6 all colonies of *Staph. pyogenes* isolated appeared to be penicillin-resistant, and from 2 resistant and sensitive colonies were isolated. Penicillin-resistant colonies from all these 6 members of the staff, from the 9 cases of operation wounds infected with penicillin-resistant strains of *Staph. pyogenes*, and from one patient with a similarly infected burn were phage typed as follows:

Source		*Date of isolation*		*Phage reaction*
Infected wound 1	...	March 3	..	47 (+)
„ „ 2	..	Feb. 23	..	47 (+)
„ „ 3	..	„ 26	..	47 (+)
„ „ 4	..	March 3	..	47 (+)
„ „ 5	..	April 12	..	6/47 (+)
„ „ 6	..	„ 20	..	47 (+)
„ „ 7	..	„ 19	..	47 (+)
„ „ 8	..	„ 19	..	47 (+)
„ „ 9	..	May 7	..	47 (+)
„ burn ..	..	April 27	..	6/47 (+)
Surgeon 1 Skin	..	March 31	..	6/47 (+)
„ 2 Nose	..	April 24	..	3B/3C/51
Nurse 1 Nose ..	..	March 31	..	N.T.
„ 2 „ ..	..	April 3	..	42B/42E/47C
„ 3 „ ..	..	March 31	..	N.T.
„ 4 „ ..	..	„ 31	..	47 (+)

(+) = side reactions. N.T. = not typable.

It will be seen that 8 of the 10 patients were infected by staphylococci of the same phage type, 47 (+), and that one nurse carried this type in her nose. The strains from the other 2 patients were both 6/47 (+), and this phage type was present on the skin of one surgeon. What, however, is rather surprising is that at least 3 other penicillin-resistant phage types were present in the noses of members of the staff.

Previously it had been found (Barber 1947b) that the proportion of penicillin-resistant staphylococci in the maternity department was 56% while that of the rest of the hospital was 38%. It had also been shown that 5 infections with such strains in this department in six weeks were all due to organisms of phage type 6/47. It had been shown that *Staph. pyogenes* of this phage type was present in the air of 2 of the maternity wards at about the same time. Since then precautions had been taken in this department to guard against cross-infection, and all prophylactic penicillin had been stopped. In the present series 31 cases came from maternity wards, and 17 (55%) of them were due to penicillin-resistant organisms.

DISCUSSION

Three important questions arise in connexion with these penicillin-resistant strains of *Staph. pyogenes*, and at present no satisfactory answer can be given to any of them.

1. How do these strains arise? Before attempting to deal with the more fundamental aspect of this question I think it should be stated that, though penicillin-resistant strains of *Staph. pyogenes* are now appearing with increasing frequency in many hospitals, this is probably not the case in the community at large. Harley et al. (1946) showed that the percentage incidence of penicillin-resistant strains of *Staph. pyogenes* as hospital infections in wounds was nearly double that of the percentage in all infections. This would be expected. The frequency of cross-infection in hospitals has been emphasised by many workers (see Miles et al. 1940, Allison et al. 1946). Gillespie et al. (1939) showed that up to 40% of the hospital staff might carry *Staph. pyogenes*, and this has since been confirmed repeatedly. That these human carriers often give rise to hospital infections is not now disputed, and they, together with cross-infection from patient to patient, are probably the ultimate cause of all such cases (Hare and Mackenzie 1946). It is equally possible that a member of the staff may become a nasal carrier of a particular strain of staphylococcus as a result of infection from a patient. Thus it is possible that the number of strains of staphylococci in infections in a particular hospital at any one time may be quite small, and once a penicillin-resistant strain appears it will survive while penicillin-sensitive strains are rapidly eliminated by penicillin. Thus by a simple process of selection penicillin-resistant staphylococci may come to outnumber penicillin-sensitive strains. That this process of selection is taking place is clear from the phage reactions listed above, and from the fact that a similar group of infections in one department in the 1947 series were all caused by penicillin-resistant staphylococci of the same phage type.

Is this process of selection the whole story? Or are these penicillin-resistant strains organisms which were naturally sensitive to penicillin but at some stage in their career acquired resistance to it? The former hypothesis is supported by cases 2 and 3, who yielded penicillin-sensitive and penicillin-resistant strains of unrelated phage types. A similar case was reported in the series studied between February and June, 1947 (Barber 1947b), and 5 such cases in the series of April-November, 1946 (Barber 1947a). On the other hand, case 4 of the present series and a patient in the 1946 series had penicillin-sensitive and penicillin-resistant organisms of the same phage type, and North and Christie (1946) have reported a case where a single serological type of *Staph. pyogenes* appeared to develop resistance under treatment.

One objection to the view that these strains acquire their resistance is that it has not so far been possible to train a staphylococcus in vitro to destroy penicillin. The type of resistance to penicillin produced in the test-tube is quite different. Whether or not, however, these penicillinase-producing staphylococci acquire their resistance, as indicated above selection probably plays a large part in the increasing frequency of their appearance.

2. Can infections with these organisms be successfully combated with massive doses of penicillin? It appears that they can in some cases. The determining factor is probably the heaviness of the infection. These staphylococci are resistant to penicillin largely because they destroy it; a large inoculum has enough ready-made penicillinase to grow in 1000 units of penicillin per ml., whereas a small inoculum may be inhibited by less than 1 unit per ml.

3. Is it possible to make these resistant organisms sensitive to penicillin? Both Voureka (1948) and Winner (1948) claim that this can be done by growing them in mixed cultures. We have been unable to confirm this. I have pointed out (Barber 1948) that strains which have been kept in the laboratory for some time do not breed true but tend to give rise to increasing numbers of penicillin-sensitive daughter colonies; and that after growing ten strains in the presence of the Milne streptococcus, which was one of the organisms used by Voureka, there was no significant increase in the number of penicillin-sensitive colonies. Voureka (1948) started her work with the suggestion that penicillin-resistant organisms might lack some chemical factor which other bacteria might supply, thus rendering the resistant organisms sensitive to penicillin. She does not differentiate clearly in her paper between staphylococci which have acquired resistance in vitro and penicillinase-producing strains. Whatever may be the case with the former, it seems clear that the latter do not lack anything but, on the contrary, have an extra property—the capacity to destroy penicillin. They show none of the morphological, cultural, and pathogenic differences seen in staphylococci which have acquired resistance in vitro. Voureka's claim that the same process renders both types of resistant organism sensitive seems unlikely. However, since penicillinase-producing staphylococci do not breed true, it seems possible that the

DEGREE AND TYPE OF RESISTANCE

All the 59 resistant strains produced penicillinase. As has been shown previously (Luria 1946, Barber 1947a), the degree of resistance of such strains when measured in the laboratory may vary many hundredfold according to the size of inoculum used. Therefore no attempt has been made in this study to estimate the exact amount of penicillin which would inhibit growth. It may be said, however, of all the strains that if a single colony was streaked across a penicillin-ditch plate containing 10 units of penicillin per ml. of agar in the ditch, growth took place right across the plate. Strains showing a minor degree of resistance were not encountered. One interesting phenomenon shown by these penicillin-destroying staphylococci was that colonies in the neighbourhood of the ditch were just as large as those elsewhere. Where the inoculum was small, growth of such organisms might be completely inhibited by the penicillin in the ditch; but if growth did take place it was apparently unimpeded. This is in striking contrast to the growth of a *penicillin-sensitive staphylococcus*, which usually shows progressively smaller colonies as the ditch is approached.

STREPTOMYCIN SENSITIVITY

Streptomycin-sensitivity was tested in 97 strains: 55 were penicillin-resistant; 13 were penicillin-sensitive strains isolated in association with 13 of the resistant cultures; and 29 were penicillin-sensitive strains isolated from patients who yielded no penicillin-resistant colonies. Broth-cultures of the organism were plated on to streptomycin-ditch plates opposite a culture of the Oxford staphylococcus. All 42 penicillin-sensitive and 53 of the 55 penicillin-resistant strains showed a sensitivity to streptomycin similar to that of the Oxford staphylococcus; one penicillin-resistant strain showed a few resistant colonies when the broth-culture was plated on a streptomycin-ditch plate, but 50 colonies picked from a plain blood-agar plate and streaked across a streptomycin-ditch plate all showed a sensitivity similar to that of the Oxford staphylococcus; from one penicillin-resistant strain all colonies tested appeared to be considerably more resistant than the Oxford staphylococcus to streptomycin.

SOURCE OF RESISTANT STRAINS

It is not disputed that the rapid increase of penicillin-resistant staphylococci is primarily caused by the widespread use of penicillin. There are, however, at least two ways in which penicillin may have this effect. Either a strain may acquire resistance to penicillin, or naturally resistant organisms, originally few, may survive while penicillin-sensitive organisms are destroyed, and thus by a simple process of selection become increasingly common. In an attempt to find out whether one or both of these processes is taking place, the results here recorded have been studied in relation to penicillin treatment and epidemiology. Selected groups of staphylococci were kindly phage typed by Dr. Allison.

The penicillin sensitivity of *Staph. pyogenes* in relation to previous recent treatment with penicillin was as follows:

	Penicillin	*No penicillin*
Penicillin-sensitive strains only ..	4	37
Penicillin-resistant strains isolated	29	30

Only 4 patients who had had penicillin before the swab was taken yielded penicillin-sensitive staphylococci, and 2 of these 4 had only been treated for a day, and 1 only for two days. On the other hand, 30 patients who had not had penicillin recently before the swab was taken yielded penicillin-resistant strains. Of these 30 patients 1 had had a course of penicillin injections three months previously, but no history of penicillin treatment at any time was obtained from the remaining 29. It is interesting, however, that 21 of this group of patien were in the maternity department, 19 having neonat infections.

As stated previously, from 3 patients (cases 1, 2, and the first specimens tested yielded staphylococci whi were all as sensitive as the Oxford staphylococcus penicillin, but subsequent specimens revealed the presen of penicillin-resistant staphylococci.

Case 1 had empyema, and the first specimen of pus examin was taken after a three-week course of penicillin injectio (30,000 units three-hourly). This gave a growth of penicilli- resistant *Ps. pyocyanea* and penicillin-sensitive *Staph. pyogen* Three weeks later a second specimen yielded *Proteus, I pyocyanea*, and a few colonies of *Staph. pyogenes*, all of whi were penicillin-resistant.

Case 2 had an abscess in each axilla. A specimen of p from the right axilla, taken on March 8, gave a pure grow of *Staph. pyogenes*, all of which appeared as sensitive as t Oxford staphylococcus to penicillin. Penicillin treatmen 60,000 units six-hourly, was started, and specimens of p taken next day from both axillæ yielded pure growths *Staph. pyogenes*, but the specimen from the right axi showed a few penicillin-resistant colonies. A penicill sensitive colony from each of the three specimens and one the penicillin-resistant colonies were all subcultured and se to Dr. Allison for phage typing. The phage reactions w as follows:

Source of specimen		*Date of specimen*		*Penicillin-sensitive colonies*		*Penicillin-resistant colonies*
Right axilla ..		March 8	..	42 E	..	—
,, ,, ..		,, 9	..	42 E	..	6/47
Left ,, ..		,, 9	..	42 E	..	—

It will be seen that the three penicillin-sensitive coloni were of the same phage type, whereas the resistant colo- was different.

Case 3 had bronchopneumonia and bronchiectasis I sputum on admission gave a pure growth of penicilli sensitive *Staph. pyogenes*. Four days later, after 24 hou penicillin treatment (30,000 units three-hourly), a seco specimen gave a similar pure growth of *Staph. pyogenes*, b of 20 colonies tested against penicillin 19 were resistant a 1 was as sensitive as the Oxford staphylococcus. Sensitiv and resistant colonies were phage typed as follows:

Date of specimen				*Penicillin-sensitive colonies*			*Penicillin-resistant colonies*
7/5	..	..	..	52	..	..	—
11/5	..	..	..	44A (w)		..	47 (+)

(w) = weak. (+) = side reactions.

Here it is seen that all 3 colonies tested were of differen phage types.

Case 4, in contrast to cases 2 and 3, had an infected oper tion wound which gave a mixed flora of *Proteus* and *Stap pyogenes*; 10 of the staphylococcal colonies from this cas were tested against penicillin, and 9 were found resistant an 1 sensitive. A sensitive and a resistant colony were phag typed, and both gave the reaction *47 (+)*.

Of the patients studied, 17 came from the two main surgical wards, and 13 of these yielded penicillin-resistan strains of *Staph. pyogenes*. In 10 of the patients the organisms were isolated from infected operation wounds, and from 9 of these 10 patients *penicillin-resistant* strain were isolated. The noses and skin of 21 members of the staff working in these wards were therefore tested for

TABLE III—CARRIER-RATE OF *Staph. pyogenes* IN STAFF O SURGICAL WARDS

Site	*Staph. pyogenes* not isolated	*Staph. pyogenes* isolated		
		Total	Penicillin-sensitive only	Penicillin-resistant colonies isolated
Total ..	12	9	3	6
Nose ..	..	8	3	5
Skin ..	..	2	1	1

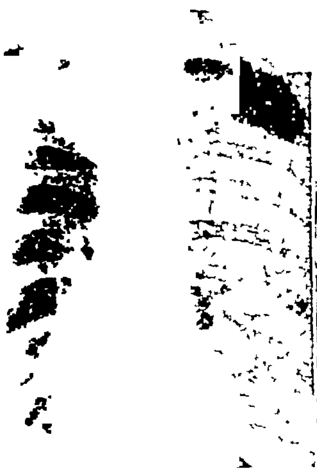

Fig. 2—Anteroposterior view of chest, showing prominent aorta.

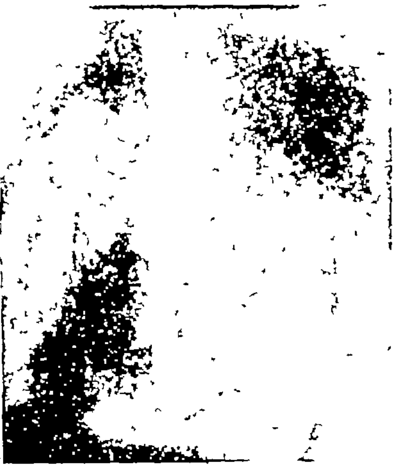

Fig. 3—Left oblique view of chest, showing uncoiled and atheromatous aorta, and left ventricle not enlarged.

ing and Smith (1939) described one case in a man of , in which improvement did not follow bilateral denervation; however, few details are given and, though they state that both sinuses were hypersensitive, they do not mention whether the attacks could be reproduced by pressure over them.

ANATOMY OF NERVES OF CAROTID SINUS

The nerves of the carotid sinus are disposed in three groups or pedicles, derived from the glossopharyngeal nerve, the vagus nerve, and sympathetic nerves (fig 1).

(1) *From the Glossopharyngeal Nerve.*—At the point where the glossopharyngeal nerve crosses the lateral aspect of the internal carotid artery it gives off two branches which descend on the lateral aspect of the artery, pass towards its anterior aspect, and end in the anterior border of the carotid body.

(2) *From the Vagus Nerve.*—The vagus nerve supplies a lateral and a medial set of branches. The lateral branches arise from the trunk of the nerve or from the ganglion nodosum. They follow the same course as the glossopharyngeal pedicle, with which they are intimately related. The medial (and more important) branches first run with the superior laryngeal and pharyngeal branches of the vagus; leaving these, they pass to the posterior aspect of the internal carotid artery to end in the posterior border of the carotid body.

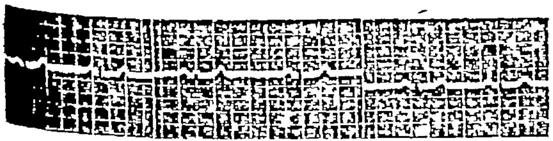

Fig. 4—Electrocardiogram.

(3) *From Sympathetic Nerves.*—Numerous fibres spring from the superior cervical ganglion and the pharyngeal plexus, run in contact with the posterior aspect of the internal carotid artery, and end (above the nerves of the vagal pedicle) in the posterior border of the carotid body. Occasionally a twig reaches the carotid body from the hypoglossal nerve

CASE-RECORD

The following is an example of the vagal type, apparently cured by bilateral carotid-sinus denervation, without any adverse after effects.

A retired banker, aged 61, was admitted as an emergency on Dec. 10, 1946, after a sudden attack of giddiness and vomiting.

Past History.—About 15 years ago, while sitting at his office desk, he had an attack of weakness in which his head fell back suddenly two or three times, for no accountable reason, and he was off work for several weeks. For the past 12 years or so, he had had "giddy turns," consisting of the sudden onset of a sensation of falling to one side or the other, with a swaying or staggering gait. The first attack came on while he was playing golf; other attacks have occurred when turning quickly, looking up—e.g., at a bookshelf—moving his head to one side or the other, and sometimes while sitting still at his desk. There is no warning of an attack, and he has never lost consciousness. The attacks have gradually become more frequent but are usually of a similar severity and last about 10 minutes. Once he wanted to get out of bed in the night and, turning on his left elbow, fell suddenly and violently backwards. This happened five or six times until he felt faint and sick.

He has been under the care of his doctor, who has called about once a month, and records of the blood-pressure have been kept: from December, 1945, the readings have been 160–200/110–115 mm. Hg.

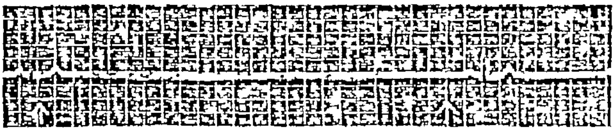

Fig. 5—Cardiac asystole caused by pressure over right carotid sinus: *a*, pressure applied; *b*, pressure released.

The patient has occasionally noted "blind spots," usually associated with his attacks but sometimes not, consisting of a black area about 10 cm. wide, outlined by a quivering margin, on the page which he is reading. Apart from minor disorders, he has otherwise been well; but he had a nervous breakdown in 1914, benign "glycosuria" in 1925, and his doctor has always thought some of his symptoms were of nervous origin. The patient recently retired from business. A labyrinthine cause for the attacks has been excluded.

Family History.—His father was an asthmatic and died of Bright's disease at 66. His mother died at his birth.

Present Illness.—On the day of admission the patient experienced temporary giddiness when he got out of a tram-car and turned suddenly to cross the road. He went into a restaurant and began his lunch. Again he felt sick, with sweating and water-brash, got up, and staggered to the cloakroom, where he was violently sick and collapsed.

On Admission.—General condition good. High-coloured with clinical polycythæmia. Still feeling cold after his attack but well oriented and not collapsed. Heart not clinically enlarged. No abnormality on auscultation. Blood-pressure 220/130 mm. Hg; with a silent gap between 210 and 160 mm. Pulse regular, rate 80 per min.; mild retinal arteriosclerosis. Other systems normal.

Radiography.—Left ventricle not enlarged. Cardiac outline normal. No hilar congestion. Aorta somewhat uncoiled, elongated, and dense, suggesting atheroma (figs. 2 and 3).

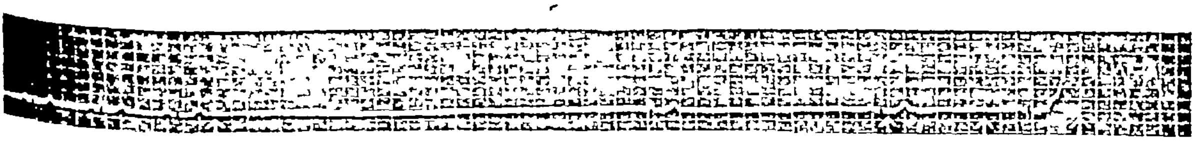

Fig. 6—Effect of pressure over left carotid sinus: *a*, pressure applied; *b*, loss of consciousness; *c*, convulsion; *d*, pressure released.

natural tendency of the organisms to produce penicillin-sensitive daughter colonies might be accelerated by artificial means. Further research along these lines is clearly needed.

SUMMARY

Of 100 cases of infection with *Staph. pyogenes* investigated in one hospital between April and June, 1948, 59 yielded penicillin-resistant organisms. Previous studies in the same hospital gave an incidence of 14·1% in 1946 and 38% in 1947.

The 59 resistant strains have been analysed according to type of infection and whether they were isolated in pure or mixed culture.

All 59 produced penicillinase and when tested by streaking a single colony across a penicillin-ditch plate were resistant to at least 10 units of penicillin per ml.

The incidence of resistant strains has been studied in relation to penicillin treatment and epidemiology in an attempt to throw light on their source. It is suggested that a process of selection is the major factor for their increasing incidence in hospitals.

Our thanks are due to Dr. V. D. Allison for the phage typing results and to Dr. E. Cooper, Dr. J. Holborow, and Dr. D. Mitchison for the primary isolation of many of the strains.

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CAROTID-SINUS SYNDROME

A CASE TREATED BY BILATERAL DENERVATION

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Hering (1927) discovered the mechanism in animals through which pressure over the carotid sinus leads to slowing of the heart, by demonstrating sensory nerve-endings in the wall of the artery and tracing afferent nervous connexions with the medulla. These observations were confirmed by Heymans (1929) and later workers. It is now established that afferent impulses, arising as a result of stimulation of receptor organs in the adventitia of the carotid sinus and aortic arch by changes in intra-arterial pressure, normally play a part in the reflex regulation of blood-pressure and heart-rate; the centre for the reflex is in the medulla. An increase in intracarotid pressure is followed by a reduction in the systemic blood-pressure and in the heart-rate; a decrease has the opposite effect. The reflex is most active when the change in intracarotid pressure is sudden. It is present in man, and most marked in hypertensive persons.

The clinical implications of these observations studied in detail by Weiss and Baker (1933), Ferris et (1935), and Weiss et al. (1936), who showed that sensitivity of the carotid-sinus reflex might be resp for some cases of syncope and of convulsions, and lesser disorders of cerebral function as dizziness weakness. The patient is usually a middle-aged elderly man, often with arteriosclerosis, hypertensio and emotional instability. Symptoms may be precipitat by a sudden movement of the neck, may appear warning, or may be preceded by an aura such as wea ness, dizziness, or epigastric discomfort. At the of an attack the patient is usually standing or and further symptoms, such as loss of consci may be prevented by lying down immediately.

Three types of attack were described, depending the dominant motor pathway of the hypersensitive reflex:

(1) *Vagal.*—Cardiac arrest from sino-auricular or auriculo-ventricular block, leading to cerebral anoxæmia and a fall in blood-pressure. This can be abolished with atropine and prevented with adrenaline through its local stimulating effect on the ventricules.

(2) *Depressor.*—Reflex vasodilatation with a fall in blood-pressure and cerebral anoxæmia, the least common type. This can be aborted or prevented with adrenaline but not abolished with atropine.

(3) *Cerebral.*—No change in heart-rate or blood-pressure, but stimulation of cerebral centres as a result of impulses reaching the medulla. This is not affected either by atropine or by adrenaline.

Mixed forms may occur. Naturally such attacks cause nervousness and anxiety. The important diagnos point which distinguishes them from other conditions, such as epilepsy, is their constant reproduction b pressure over one or other carotid sinus.

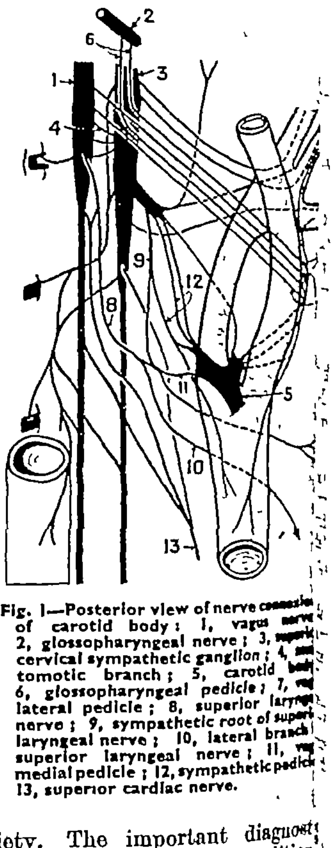

Fig. 1—Posterior view of nerve of carotid body: 1, vagus 2, glossopharyngeal nerve; 3, cervical sympathetic ganglion; 4, tomotic branch; 5, carotid 6, glossopharyngeal pedicle; 7, lateral pedicle; 8, superior laryn nerve; 9, sympathetic root of super laryngeal nerve; 10, lateral branch superior laryngeal nerve; 11, medial pedicle; 12, sympathetic pedic 13, superior cardiac nerve.

If the attacks are mild and not seriously incapacitatin reassurance, and the administration of sedatives an ephedrine may be all that is necessary; but, if they a severe and recurrent and there is no response to simpl measures, denervation of the carotid sinus on one or bot sides is indicated, a procedure shown by Weiss et (1936) to abolish the reflex. Examples of successf unilateral denervation have been reported.

It has been shown that unilateral carotid-sinu denervation has no permanent ill effects (Craig an Smith 1939, Mulholland and Rovenstine 1941, Ray an Stewart 1942), but reports on bilateral denervation ar few, at least in English publications, and this operatio seems seldom to have been performed, presuma through fear of untoward after effects. Capps and Takats (1938) re-investigated two patients on whom t procedure had been carried out apparently for epilep and found that neither hypertension nor tachyca had resulted; but postural hypotension was considerable polymorphs 39%, eosinophils 2%, lymphocytes 53%, monocytes 3%). The mother's Wassermann reaction was negative. Glucose water by mouth was advised, and the diarrhœa and vomiting ceased. However, by this time the mother's breast-milk had failed, so bottle-feeding was started.

A right otorrhœa developed 18 days later, and in a further 2 days the vomiting recommenced; on the following day everything by mouth was returned and there was mucus in the vomits. When taken to hospital the next day only boiled water by mouth for 24 hours was prescribed. The vomiting ceased before the 24 hours were up, so the mother again resumed milk feeds; and there was further vomiting. For the ensuing 2 days glucose water only was given by mouth, and the child was then sent to this hospital.

On admission, she was moderately dehydrated, with scurf in the scalp and red buttocks. The eyes, mouth, throat and lungs, chest, and abdomen showed no abnormality.

Urine.—No pus cells, red blood-cells, or casts seen in the centrifuged deposit. There was a light cloud of albumin.

Blood.—Wassermann and Kahn reactions negative.

Stools.—*Proteus vulgaris* present. Repeatedly negative for *Staphylococcus aureus* and organisms of the salmonella and shigella groups.

Treatment and Progress.—On admission half-strength Hartmann's solution with 5% glucose was given by mouth, and during the first 18 hours there was no vomiting and no stools were passed. At 10 A.M. next morning one-eighth strength 'Ostermilk No. 1' was started, and in the next 24 hours there were three vomits and five small stools. At the end of that time two very large offensive stools were passed, and the feeds were changed to 'Nestlé's Sweetened Condensed Milk,' one-sixth strength, $2^1/_2$ oz. 3-hourly. At this time also the right eye was discharging, and penicillin 000 units intramuscularly b.d. was started. Cultures from the eye grew *Staph. aureus.*

On the 3rd day after admission fourteen stools were passed, and there were two vomits. At 4.30 P.M. the stomach was washed out and 3 oz. of subcutaneous saline was given. The parenteral fluid was repeated at 12 midnight and at 9 o'clock next morning. Streptomycin by mouth was also started, the dose and method used being that described by James and Kramer (1948). By 3.30 A.M. on the 4th day the *P. vulgaris* had been eliminated, and by 6.30 A.M. the stools were sterile on aerobic culture and remained so for 24 hours. After that time *Streptococcus fæcalis* and coliform organisms reappeared, but only in small numbers.

Progress during the next 2 days was satisfactory, the baby gaining 8 oz.

At 10.15 A.M. on the 7th day after admission there was sudden collapse. The baby was very pale, cold, and drowsy; her respirations were extremely shallow, her pulse was imperceptible, and her heart sounds could be heard only with difficulty. Despite injection of nikethamide, administration of oxygen, and later artificial respiration, the baby died at 45 A.M.

Necropsy.—No cause of the sudden death could be found, the only macroscopical changes being moderate fatty degeneration of the liver and well-marked congestion of the lower part of the small gut. No ulceration was seen. Cultures taken from the terminal ileum gave a very heavy pure growth of a coagulase-positive streptomycin-resistant *Staph. aureus* (heavy growth in streptomycin 1000 units per ml.). Unfortunately by this time the cultures from the eye had been destroyed, so the *Staph. aureus* from that source could not be tested for streptomycin sensitivity.

From the time that streptomycin was started by mouth, every stool passed was cultured on blood-agar, and at no time was *Staph. aureus* isolated. It is evident, therefore, that the organism in the gut had multiplied very rapidly.

The ability of *Staph. aureus* toxin on ingestion to produce acute food-poisoning is widely recognised, but it is less well known that in children the organism is capable of causing enteritis by multiplication in the gut. Felsen and Wolarsky (1942) and Draper and Brown (1946) describe several cases, three of those in the latter's series proving fatal.

It has also been shown (see Waksman 1947) that many of the normal organisms of the alimentary tract are capable of exerting antagonistic effects against staphylococci in vitro, and it is possible that the great reduction or temporary elimination of coliforms which follows the administration of streptomycin by mouth (Smith and Robinson 1945, James and Kramer 1948) may predispose towards such intestinal infection.

SUMMARY

A fatal case of enteritis in an infant receiving streptomycin by mouth is described.

A streptomycin-resistant coagulase-positive *Staph. aureus* was obtained in pure culture from the terminal ileum at necropsy.

It is suggested that the *Staph. aureus,* already present elsewhere in the body, was rendered streptomycin-resistant by the small amount of the drug absorbed from the gut, and that elimination of the normal intestinal flora may have contributed to the establishment of the staphylococcus there.

I am indebted to Dr. Ursula Shelley for permission to use the clinical notes of this case, to Dr. W. H. Hughes who performed the necropsy, and to Sir Alexander Fleming, F.R.S., for his advice and criticism.

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TREATMENT OF LOCAL INFECTION WITH DIAMIDINES

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DESPITE the successes obtained in the past eleven years in treating bacterial infections, some still remain unamenable to treatment. In a high proportion of these, gram-negative rods can be identified either alone or with other pathogens. We have tried to develop a technique for their elimination, mainly confining our attention to surface infections as before (Kohn et al. 1943).

The antibacterial properties of derivatives of the diamidines (Ashley et al. 1942) suggested that they were worthy of clinical trial.

Our first experiments were made with 2 : 2′-dibromo-4 : 4′-diamidino-α-γ-diphenoxypropane or 'Dibrompropamidine' and 2-iodo-4 : 4′-diamidino-α-ε-diphenoxyhexane or 'Iodohexamidine,' which in the absence of convenient short names will be referred to by their laboratory numbers M. & B. 1270 and M. & B. 1314. Owing to limitations in the supply of M. & B. 1314 most of our work was done with M. & B. 1270, but there seems little to choose between the two compounds as regards their action on staphylococci, except that when a strain in a wound has been found insensitive to one it has been sensitive to the other.

Bacteriological studies were made on each case together with appropriate sensitivity tests. Cultures were taken every day or at the time of each dressing, even when dressings were done more than once daily. The routine was to sow a loopful of discharge from the wound on a warmed blood-agar plate directly at the bedside. Blood-agar was used as a routine unless there was any indication for a special medium. In recording the results an arbitrary system of plus signs was used: ++++ indicated a plate completely overgrown, and + the presence of only three or four colonies, ++ and +++ being gradations between these. To prevent contamination of the culture-media with the drug, wounds treated

Urine.—Sp. gr. 1·028. No albumin or sugar. Microscopically normal.

Blood.—Red cells 6,200,000 per c.mm., Hb 120%, white cells 11,200 per c.mm. Blood-urea nitrogen, 18 mg. 100 ml. Wassermann reaction negative.

Electrocardiogram.—Normal limb leads (fig. 4) and chest leads.

Progress.—In view of the failure to find any other abnormality, and the presence of polycythæmia and symptoms probably related to hypertension, venesection 600 ml. was performed on Dec. 15. On Dec. 22, shortly before his discharge, he sat up in bed to look down at his breakfast tray, and this precipitated one of his attacks, an event which suggested that his symptoms might be due to a hypersensitive carotid sinus.

This was easily confirmed by light pressure over either carotid sinus which produced immediate cardiac asystole (fig. 5), and symptoms similar to those to which he is accustomed in his attacks immediately followed. The left carotid sinus was more sensitive than the right. Pressure on the left side was then made and kept up while a continuous electrocardiogram was taken. Immediate cardiac asystole was again produced; in 9 seconds he lost consciousness, and in 10 seconds began a generalised convulsion, whereupon the pressure was released (fig. 6).

The patient seemed to be sensible, if somewhat sensitive, and though he had retired from business his whole life was being seriously inconvenienced by these attacks, which were also a source of anxiety and uncertainty. Bilateral denervation of the carotid sinus was recommended.

Since both carotid sinuses were so extremely sensitive, it was thought advisable to expose each in turn, and to anæsthetise it, before proceeding with the stripping, so as to avoid any disturbance consequent on the manipulation of the vessels which would be required.

Operation (Jan. 16, 1947).—Dr. John Gillies gave thiopentone and cyclopropane; Mr. A. J. Slessor assisted. The bifurcation of the right common carotid artery was freely exposed through an incision along the anterior border of the sternomastoid, and the three vessels were covered with a swab soaked in 2% procaine solution. A similar procedure was next carried out on the left side. When, after 10 minutes, the operation on the right side was resumed, firm pressure on the carotid sinus did not give the abnormal response. The vessels were rigid from calcareous changes. Some 2% procaine was injected under the adventitia of the common, internal, and external carotid arteries for a length of 5 cm., after which the adventitia was removed by sharp dissection. On the left side the findings and procedure were the same. The wounds were closed without drainage, and the patient's convalescence was uneventful.

Follow-up in Outpatients' Department.—On Feb. 5, 1947 (20 days after operation), there had been no further attacks similar to his previous experiences, but a few short attacks of palpitation, coming on suddenly, lasting for a few minutes, and apparently slowly passing off had been experienced. It was considered possible that these were brief attacks of paroxysmal tachycardia, but were more probably simple sinus tachycardia. The patient had also had one attack of loss of vision for the central part of a page. This was the first for over a year and was considered to be due to vasospasm. General condition good. Heart clinically normal. Blood-pressure 210/120 mm. Hg. No change in the rate or volume of the pulse when either carotid sinus was pressed firmly.

March 5, 1947: No further attacks, but on several occasions has had a light feeling in the head as though falling through the air, accompanied by weakness of the legs but no faintness or dizziness, and lasting about 10 minutes—quite unlike his previous attacks. Blood-pressure 150/100 mm. Hg. He has been taking 'Theominal.'

April 16: Two weeks ago had an attack of "acute gastritis," when his doctor found a blood-pressure of 130/85 mm. Hg. Also had two brief attacks of central loss of vision. Blood-pressure 180/110 mm. Hg. Firm pressure over either carotid sinus has no effect on the pulse.

May 28: Quite well. Playing golf. Blood-pressure 170/105 mm. Hg.

July 9: Very well. No recurrence of symptoms after the operation six months ago. Blood-pressure 180/120 mm. Hg. Screening of heart showed no change from previous examination. Electrocardiogram normal.

Oct. 1: Very well. Blood-pressure 180/110 mm. Hg.

Jan. 14, 1948: No complaints. No recurrence of hi attacks. Now that his confidence has been restored he leading a normal life and playing golf regularly. No sym toms of postural hypotension. Heart clinically norm Radiography as before. Blood-pressure 190/110 mm. H Firm pressure over either carotid sinus has no effect.

On April 28, when last seen, he reported tw momentary attacks of giddiness, unlike those experienc before, but associated with a similar area of loss of visi in one eye. One attack occurred while walking down t main road and another while playing golf, but neith was sufficiently severe to interfere with what he w doing. Physical findings were as before, and, sin there has been no return of the sensitivity of eith carotid sinus, it may well be that these two brief atta of giddiness, accompanied by scotomata, were associat with vasospasm and related to his hypertension.

SUMMARY

A man of 61 with benign essential hypertension h frequent incapacitating attacks of giddiness, whi were shown to be due to hypersensitive carotid-sin reflexes.

Bilateral carotid-sinus denervation was carried o and during the succeeding year the patient has be free from his previous attacks. There have been adverse effects from the operation.

The possibility of this ætiology should be consider in similar cases.

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FATAL STAPHYLOCOCCAL ENTERITIS DEVELOPING DURING STREPTOMYCIN THERAPY BY MOUTH

IVOR R. H. KRAMER
L.D.S. R.C.S.
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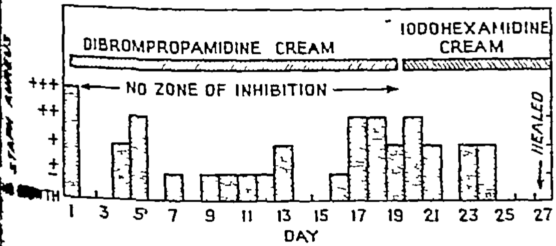
IT has been shown (Elias and Durso 1945, James an Kramer 1948) that when streptomycin is administered b mouth extremely high concentrations of the drug may b obtained in the stools (up to 9000 units per g.), and th growth of any sensitive organisms already present passing through the stomach during oral streptomyc therapy would be effectively prevented. Recentl (James and Kramer 1948) attention has been drawn to th possibility that, in patients receiving streptomycin b mouth, organisms remote from the gut may be rendere resistant by the small amount of the drug entering th blood-stream. This mechanism may provide a foc of resistant pathogens capable of reaching the gut an multiplying there, particularly in infants, where th bactericidal action of the gastric secretions is less tha in the adult. It seems probable that this unfortunat sequence of events occurred in the following case.

CASE-RECORD

A girl, aged 6 weeks. First child, normal pregnancy, ful term. Birth weight 6 lb. 7 oz.; weight on the 7th day 6 lb 10 oz. Breast-fed until the 17th day, when diarrhœa started there being twelve loose green stools that day, with sligh vomiting. The baby was taken to another hospital, " it was noted that she was severely wasted and that th liver and spleen were palpable. At that time the total leuco cytes numbered 7200 per c.mm. (stab forms 3%, neutroph chnique was evolved. Among the early cases were treated unsuccessfully with penicillic acid both in ous solution and in powder, application of the tter being painful. M. & B. 1270 and M. & B. 1314 applied in various ways with significant but not ncing results until used in powder form or incor- ated in amounts up to 5% in the new carbowax previously mentioned. In 14 successive cases of negative and coccal infection the infections were nated in not more than seventy-two hours. The nds if small were allowed to epithelialise spontaneously ath the serum scab which formed after successful treatment, or they were grafted in the usual manner ever all clinical results of the new treatment can be shown by the short stay in this hospital of ts with persistent sepsis. Owing to the lack of ate data for a truly comparable control series this ning of hospital stay cannot be expressed ically, but the change which has now taken place arent to everyone.

our early successful cases the appearance of a serum over large wounds, which rarely if ever became d thus, raised the question whether the scab might been the result of some local toxic or sclerosing of M. & B. 1270. This seemed unlikely in view of ose adherence of the scab to underlying granula- For this reason biopsies were done and serial s were made of tissues removed in the ordinary at the time of grafting three days after the start of ment. A typical specimen is shown in fig. 4, in h the edge of the serum scab can be seen with amous epithelium passing beneath it. The serum b is adherent to normal young granulations and vascular loops, and there is a complete absence of y pyknosis or polymorphonuclear reaction.



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As a further test of local reactions another case was en. This was a long-standing varicose ulcer heavily cted with *Ps. pyocyanea* and in which two unsuccessful empts at grafting had previously been made. The iddle third of the wound was treated with M. & B. 1270 powder, the remainder being covered with soft-paraffin gauze. Fig. 5 shows biopsy specimens from the control and treated areas respectively. In the control the characteristic changes of an infected ulcer are visible. whereas the treated area shows a serum scab adherent to underlying new granulations devoid of any inflammation. Sections from other cases confirm these findings.

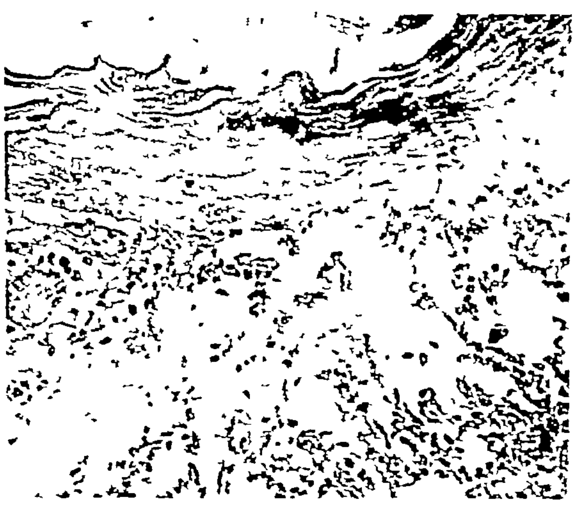

Fig. 4—Section of wound edge showing squamous epithelium extending under serum scab after treatment with dibrompropamidine. (× 225.)

The time that treatment should be continued is determined not only by the bacteriological findings but also by the type of wound and its pathology. With soft-tissue wounds results are quicker, and the time of treatment is shorter, than in lesions with much trophic disturbance, such as leg ulcers or those following neural lesions. In most cases significant infections can be eliminated in 72 hours and a decision made about further procedures such as grafting, secondary suture, or even natural healing.

We have found no evidence of general toxicity after the local application of M. & B. 1270 or M. & B. 1314, even when the former is placed in the peritoneal cavity.

ILLUSTRATIVE CASES

Intra-abdominal Sepsis

We have treated 7 cases of appendix abscesses, of which 3 were due to *Bact. coli* and hæmolytic streptococci, and 1 case of generalised peritonitis. This was done by placing 0·5 g. of M. & B. 1270 in the abscess cavity at the operation, one being a particularly severe case with an acutely inflamed friable cæcum. Tube drainage was provided in all cases at the time of operation, but dis-

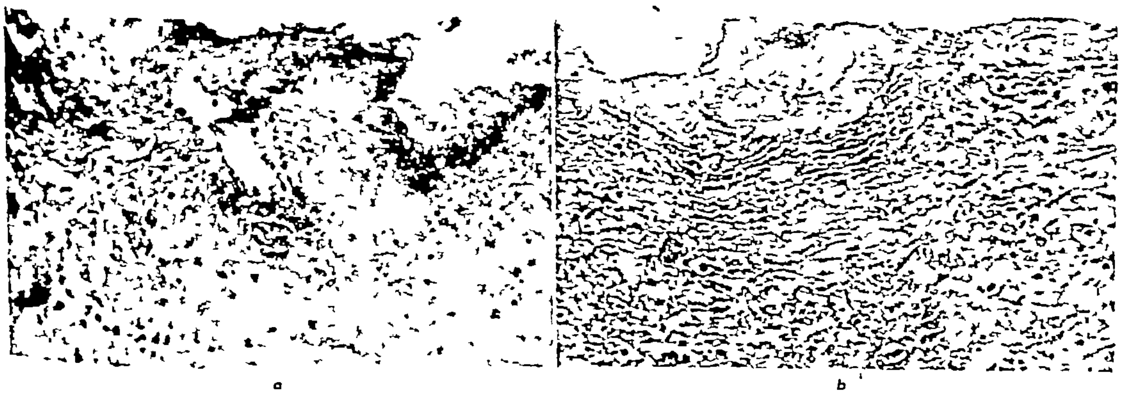

Fig. 5—Varicose ulcer: *a*, untreated area; *b*, area treated with dibrompropamidine (× 225)

BACTERIA IDENTIFIED

Lesions	No. of cases	*Ps. pyocyanea*	*Proteus vulgaris*	*Bact. coli*	*Staph. aureus*	*Hæmolytic streptococcus*
Varicose ulcers..	12	5	2	1	8	1
Traumatic ulcers	7	3	1	0	4	1
Burns	1	1	0	0	0	0
Open fractures ..	8	1	1	1	3	0
Appendicitis ..	7	0	0	3	0	2
Miscellaneous ..	2	4	0	0	1	2

with semi-solid vehicles were always carefully cleaned with saline before swabbing. Though too much saline on a surface wound might conceivably lead to a negative culture, the results obtained in the large number of cases treated suggest that this fear is unjustified. To satisfy the various opinions held regarding virulence tests on staphylococci note was made of colour changes, extent of hæmolysis, and production of coagulase. Direct films were not considered to be so useful as cultures in the treated wounds, because often bacteria seen in smears did not grow after effective local treatment had begun.

The accompanying table shows that the predominating bacteria were staphylococci and *Ps. pyocyanea*, *Proteus vulgaris* having been identified in only 3 of 32 cases, in contrast to experience in other hospitals. Diphtheroids have been isolated often, but we doubt whether these have much pathological significance in view of the clinical course of our cases once the major infection had been successfully treated. We include 3 cases of *Bact. coli* infection which occurred among 6 cases of mixed sepsis following recently treated appendicitis. Differential bacteriological studies have confirmed the findings of other workers that coccal infections are often overshadowed by *Ps. pyocyanea* in surface wounds, even after supposedly adequate treatment with sulphonamide or with penicillin (see fig. 1).

TREATMENT AND RESULTS

Initially the conditions selected for treatment were various surface lesions, including traumatic and varicose ulcers, open fractures with skin loss, indolent wounds, and an unhealed burn. In any local treatment of wounds it is necessary to ensure that purely mechanical factors do not prevent access of antibacterial agents to infected tissues. Pockets and sinuses may cause difficulties and if possible must be dealt with on first principles. Should the anatomy of the part restrict wound toilet, topical chemotherapy can be attempted, but the effect is not so dramatic as in more favourable cases.

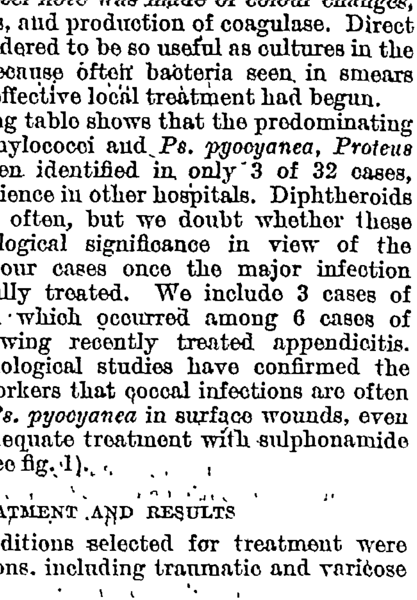

Fig. 1—Bacteriological data in a case of gunshot wound of thigh, showing prevalence of *Ps. pyocyanea*, and effect of dibrompropamidine.

At first we chose long-standing heavily infected varicose ulcers for investigating *in vivo* the action of the diamidines. Such cases are most convenient for assessing antibacterial techniques, especially against gram-negative rods, the principal pyogens outside the range of chemotherapeutic agents at present in general use. With the experience gained from these cases others likely to more difficult were treated.

There are three obvious ways in which an antibacter compound can be used for topical applications: aqueous solution, in a semi-solid vehicle, and as powd Initially, therefore, on obstinate cases we tested t effect of aqueous solutions. The use of wet dressings wounds is for technical reasons generally recognised unsatisfactory; so more attention was paid to t possibilities of semi-solid vehicles and later to the use powder. We believe that a 1:1000 solution of M. & B. 1270 may, in special circumstances, provide a useful adjuvant to surgery, but to find the optimal concentration for routine use *requires further* study.

We have examined several semi-solid vehicles generally popular for the local exhibition of antibacterial substances. Initially we used the Mumford base in which was incorporated 0·15% of M. & B. 1270 isethionat i.e., 0·1% of active product—but this and higher concent tions failed to eliminate gram-negative infections, becaus the inhibitory action of the 'Lanette wax.' Use was a made of the base devised by Todd (see Clark et al. 194 but it was abandoned for the same reason (see fig. 2).

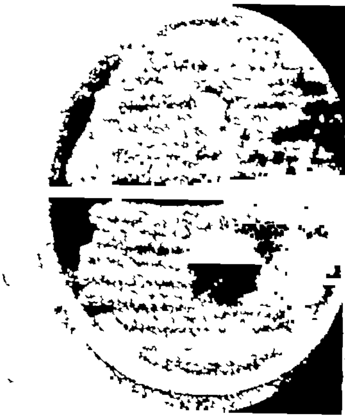

Fig. 2—Inhibition of *Ps. pyocyanea* by dibr propamidine when pure (below), but when in a cream (above).

The anticoccal action of M. & B 1270 and M. & B 13 is exerted in the presence of lanette wax probab because of the high activity of these compounds again gram-positive cocci compared with gram-negative rod Alternative vehicles have been examined. One consistin of carbowaxes, propylene glycol, and water containin 1–5% M. & B. 1270 shows the greatest promise, a further studies with it are in progress.

Dusting into wounds probably provides the best te of efficiency of any compounds being examined, and t is what we increasingly favour.

We have treated 12 cases of varicose ulcer, 7 traumat ulcers, 1 burn, 3 open fractures, 2 miscellaneous cases, a 7 cases of acute gangrenous appendicitis, but unfort nately in only 3 of the last was a precise bacteriologic examination possible. Some of these cases before comi under our care had received different treatments or treatment of any consequence. Of 16 cases with staphyl coccal infection 6 had had penicillin either alone combined with sulphonamide therapy.

The local infections fell into two groups; those d to persistence of staphylococci despite intensive trea ment with synthetic compounds or antibiotics, an those caused by gram-negative rods. Laboratory tes so often showed that the persistent staphylococc infections were insensitive or only slightly sensitive t penicillin that routine testing was abandoned. On case from which a penicillin-fast strain of staphylococcu was recovered made slow progress when treated wit M. & B. 1270 despite demonstrable sensitivity to it i vitro. Change to M. & B. 1314 eliminated the infectio in five days, and spontaneous healing took place fou days later (fig. 3).

We treated 10 cases of gram-negative infection wit one or more bacteria in various ways before a successfu chnique was evolved. Among the early cases were e treated unsuccessfully with penicillic acid both in ous solution and in powder, application of the ne being painful. M. & B. 1270 and M. & B. 1314 re applied in various ways with significant but not izing results until used in powder form or incorated in amounts up to 5% in the new carbowax s previously mentioned. In 14 successive cases of negative and coccal infection the infections were ated in not more than seventy-two hours. The ds if small were allowed to epithelialise spontaneously ith the serum scab which formed after successful treatment, or they were grafted in the usual manner. ver-all clinical results of the new treatment can be shown by the short stay in this hospital of ts with persistent sepsis. Owing to the lack of ate data for a truly comparable control series this ning of hospital stay cannot be expressed tically, but the change which has now taken place parent to everyone.

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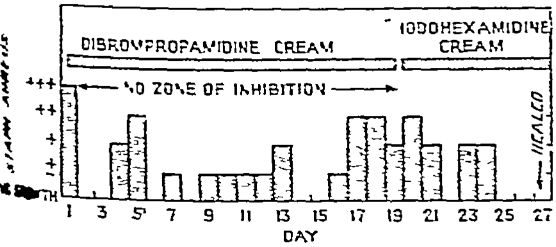

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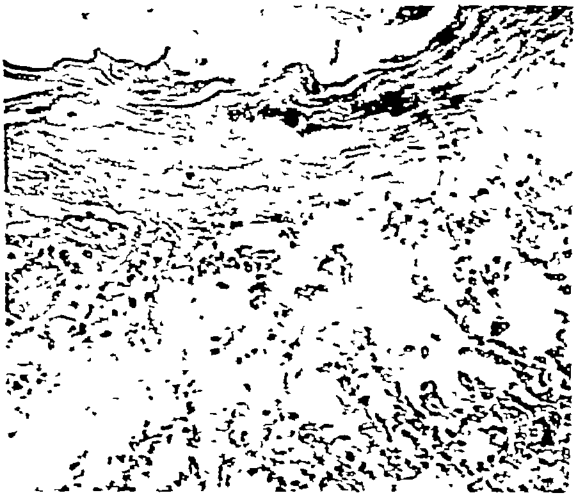

Fig. 4—Section of wound edge showing squamous epithelium extending under serum scab after treatment with dibrompropamidine. (× 225.)

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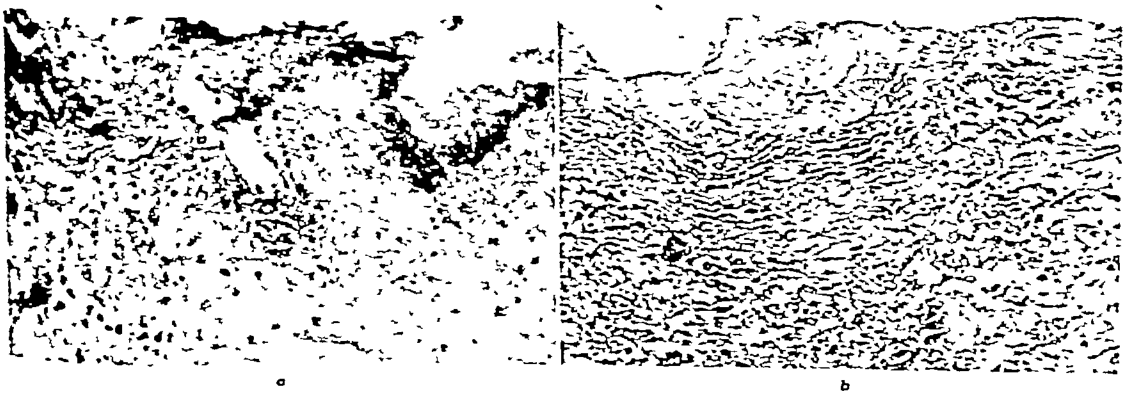

Fig. 5—Varicose ulcer : *a*, untreated area ; *b*, area treated with dibrompropamidine. (× 225.)

charge ceased so rapidly that tubes were removed within 48–72 hours, final healing taking place in not more than 14 days.

Case 1.—The case of general peritonitis secondary to gangrenous appendicitis was particularly instructive, because it demonstrated not only the action that M. & B. 1270 can exert in such infections but also its freedom from irritant effects. At operation a gangrenous appendix was found in pus which spread all over the abdomen. This pus was mopped out as far as possible, and films of it showed coliform organisms and streptococci; 0·5 g. of M. & B. 1270 was sprinkled round the cæcum, and the parietal wound was partially closed, with drainage of the pelvis. The patient, a man aged 19, was treated postoperatively with penicillin and sulphonamides, and detailed attention was paid to his fluid balance, but he never really responded and he died ten days after admission. At necropsy the findings were typical of such a case, except that in and round the cæcal area the visceral peritoneum was glistening and normal in all respects, without any fibrinous exudate or adhesions. In other words, were it possible to provide for a more widespread effect of M. & B. 1270 in the general peritoneal cavity, the life of such a patient might be saved.

Fractures

Case 2.—A man, aged 30, with an ununited open fracture of the tibia and fibula and considerable loss of overlying skin, was considered to need bone grafting. There was a scar measuring 18 sq. cm., covered with unhealthy granulations containing pathogenic *Staph. aureus.*

Powdered M. & B. 1270 was applied for 48 hours, at the end of which time culture was negative. A pedicle graft from the other leg was applied in two stages, and complete healing took place by first intention. The donor site was open and became infected with the same bacteria. Application of M. & B. 1270 for 48 hours cleaned this area, a Thiersch graft was applied, and the wound completely healed in a week.

Case 3.—A man, aged 26, had sustained an open fracture of the right tibia close to the ankle three and a half years earlier. Immediately after the accident he had been admitted to hospital, where he had remained for twelve months, undergoing first-class surgical treatment, with adjuvant penicillin and sulphonamides for the sepsis which developed. The sepsis had persisted, and further local and general penicillin therapy had been given without effect. Bony union had ultimately taken place, but he had been left with a large bone and skin defect measuring 4 cm. across and 2·5 cm. deep. In various hospitals attempts had been made without success to control the local sepsis and effect a repair. When we saw him he had the discharging wound just described, from which a pathogenic staphylococcus was isolated. M. & B. 1270 powder was dusted into the wound for 2 days. A sterile serum scab formed. This was removed, a Stent graft was applied, and the wound healed in a fortnight from the time of admission.

Varicose Ulcer

Case 4.—A man, aged 71, had had a varicose ulcer for many years. It measured 71 sq. cm. and was covered by typical necrotic material. *Ps. pyocyanea* was obtained in pure culture. M. & B. 1270 powder was applied twice daily for two days and then daily for two more days, at the end of which the wound became sterile and was immediately successfully grafted.

Reinfection.—In the early cases treated it was found that, if grafting was delayed, the wound might soon become reinfected with gram-negative bacilli. Cultures made from the skin edges just beyond a wound rendered sterile by M. & B. 1270 powder yielded a growth of similar gram-negative bacilli, and it seems that from these edges a wound may become reinfected unless countermeasures are taken. The procedure adopted initially was to dust the wound twice daily, well beyond the skin edges, with a very finely ground powder applied with a pepper-pot with many small holes, the area afterwards being covered with plain gauze. We used the small screw-capped bottles in which the "bijou" slopes of medium are contained, removed the rubber disc, and made small holes in the screw top. A sulphanilamide insufflator might be used for dusting.

DISCUSSION

Many patients had received various local applicatio before M. & B. 1270, in powder and more recently carbowax base, was applied with good effect, but t previous long treatment might have rendered the infe ing strain more sensitive to the new agent. Two fre cases of varicose ulcer, both of six months' durati were therefore selected. Neither case had had a specific treatment and both were infected only w *Ps. pyocyanea*. Clinically the effects were equally striki because discharge ceased and the raw surface beca covered with a serum scab firmly adherent to underlyi healthy granulations. To save the time necessary spontaneous healing these wounds were successfu grafted forthwith despite the fact that natural heali seemed likely to take place.

The results of treating ordinary surface wounds wi M. & B. 1270 in semi-solid vehicles justify its use a local application for the routine treatment of superfic infections. No special storage precautions are necessa The range of activity appears to be governed by vehicle used. For infections in which gram-negat rods predominate a carbowax base will be necessa but M. & B. 1270 in Todd's cream is effective in coc infections, besides relieving the pain in some staphy coccal infections, a property which does not seem simply to the bland nature of the base. Two cases persistent painful staphylococcal ulcers had had, with effect, various applications including cream bases exac similar to that used to exhibit the new compoun Within a matter of hours relief was obtained and c tinued, the most likely explanation being that prolife tion of virulent staphylococci was checked; recov was rapid.

It is contrary to generally accepted ideas about inhibition of bacterial activity that a single compo can provide an effective local treatment of surf infection by such morphologically different bacte as those under review. However, Bernheim (19 has shown that a simpler diamidine, 'Propamidi inhibits the oxidative metabolism of certain gra negative bacilli.

In all our treatments the results do not seem to ha depended on the quantity of compound used so mu as on how it was used. We have not finally decid whether better results accrue from the application pure powder than from admixture with a suita diluent. It is likely that the indications for and metho of using M. & B. 1270, and M. & B. 1314 in powder fo will make skilled supervision necessary to obtain t best results and avoid a foreign-body reaction, but t use of existing cream preparations is only limited by th range of antibacterial action. It is also likely th cream preparations can in some circumstances beneficially used after initial treatments with powder.

Touching the methods available for recording t progress of wounds, the rate of healing is not necessar the best way of recording the effects of aids to trea ment. Many infected wounds for a while make fi progress which becomes slower as fibrous tissue develo The early application of grafts, and the use of seconda suture whenever possible, introduce an artificial, b highly desirable, complication to studies of healing rat Bacteriological studies on wounds undergoing treatme may, if taken at their face value, be misleading becau positive cultures can be obtained despite obvious clinic improvement as soon as antibacterial compounds sta to exert their effects.

SUMMARY

The effects of dibrompropamidine and iodohexamidi on infected wounds have been examined.

Dibrompropamidine powdered *into surface* wound inhibits infections with gram-negative bacilli, *Ps. py*

[illegible], and *Bact. coli*, and it may find a place in the treatment of appendix abscess and resultant peritonitis.

Dibromopropamidine in castor-oil cream provides a [illegible] non-toxic practical alternative to sulphonamides and penicillin for the treatment of surface infections with gram-positive cocci. In a carbowax polyethylene-glycol base its action on gram-negative organisms is also manifest.

From the limited experiments made with iodo-[illegible] it seems to provide a useful alternative to dibromopropamidine when bacterial strains initially resistant to the latter are encountered.

We have drawn on the knowledge and experience of Dr. [illegible] in the field of chemotherapy, and we are [illegible] to him for this and for his vision regarding many problems still outstanding.

Our thanks are due to Miss Daphne Miller and Mr. J. B. [illegible] for much technical assistance, to Messrs. May & Baker Ltd. for supplies of the compounds used, and to [illegible] Gillette Industries Ltd. for the photomicrographs.

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ALGINATES IN ENDAURAL WOUND DRESSING

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The success of endaural operations, especially the fenestration operation, largely depends on a suitable postoperative dressing. Unless one obtains a dry cavity which heals by first intention in a minimum of time, [illegible] is complicated by excessive granulations, especially over bared bone.

Until recently one of us (E. R. G. P.) has used an [illegible] cellulose packing which, as it liquefies, can be sucked out of the cavity on the tenth day. This has [illegible] proved an advantage over other materials with which it is necessary as a routine to perform four or five dressings, the first always under anæsthesia (Passe 1947).

Tumarkin (1948) has also emphasised the importance of postoperative dressings in transmeatal atticotomy, recommending the use of a gel formed from a mixture of penicillin and 'Zelex,' which is mainly composed of an alginate base.

In a search for an ideal endaural dressing, alginate materials were submitted to extensive trials during the past six months. Based on the work of one of us since 1944 (Blaine 1946, 1947a and b), a wide range of materials has now been made available with properties which make them eminently useful for this purpose.

Alginate is an extract of the brown seaweeds growing on the Scottish and Irish shores, the parent substance being alginic acid, a polyuronic acid whose sodium salt combines with calcium ions to produce an insoluble gel. This reaction makes it possible to produce fabrics like [illegible] gauze, and foam; it has been found non-antigenic, sterilisable by heat, hæmostatic, and slowly absorbable in living tissue according to the vascularity of the tissue into which it is placed. Alginate is rendered soluble in solutions of sodium salts. The introduction of a variable percentage of sodium ions into calcium-alginate fabrics makes possible the production of a range of materials of variable solution-rate and absorption-rate. Antibacterial substances can be combined with these in the course of production.

Advantages of Alginate Dressing.—One of us (G. B.) has found in experimental surgical studies that calcium alginate is usually slowly absorbable in living tissue without inducing excessive formation of fibrous tissue. It is hæmostatic and a poor culture medium for micro-organisms. Alginate materials in which the percentage of sodium ions is raised by industrial chemical treatment over that of calcium ions are absorbed with far greater rapidity and with a minimal reaction. The speed of absorption or of solution again depends on the vascularity of the tissue into which it is placed. Thus, as an endaural wound dressing, where meticulous hæmostasis has been achieved and where there is only a little serous oozing, the alginate gauze or wool displays the following properties:

(1) Where the dressing is in contact with the oozing surface it is converted into a smooth jelly.

(2) Parts of the dressing not in contact with a moist surface remain, on the whole, unaltered.

(3) It can be easily packed into crevices, conforming closely to the contour of the surface to which it is applied. Dipped into saline solution, Ringer's solution, or water (according to the grade of material used) immediately before use, it becomes a truly plastic dressing which securely keeps skin flaps in place.

(4) The alginate dressing can be left in situ for the whole period of convalescence without being changed.

(5) Removal is effected by gentle withdrawal or by dissolving the material in the solvent at the grade used (saline solution, sodium citrate, or water). In the case of the water-soluble alginate grades a good part of the dressing will liquefy by the time it is to be removed.

Composition.—In these trials the following grades of alginate ribbon gauze and wool have been used:

(*a*) Calcium alginate containing cetyl pyridinium bromide (C.P.B.), an antibacterial agent akin to cetrimide ('Cetavlon.')

(*b*) 80% sodium-calcium alginate containing C.P.B.

(*c*) 20% sodium-calcium alginate containing C.P.B.

(*d*) 20% sodium-calcium alginate with 5% borax, containing C.P.B.

CONCLUSIONS

Alginate dressing is by far the most satisfactory for the aural surgeon. It can be left in situ for three or four weeks; it prevents excessive formation of granulation tissue; it obviates the patient's anticipation, fear, and discomfort of repeated dressings; and it reduces the work of the aural surgeon. Sulphadiazine and/or 'Phenoxetol' can be added to alginate dressings, though the material is a deterrent to bacterial growth owing to its content of cetyl pyridinium bromide. On removal of the dressing the cavities always appear smoothly healed and clean with the healthy pale-pink skin flap held firmly in place over the fenestra.

When used after radical endaural mastoidectomy the alginate dressings proved themselves equally excellent. In these cases the dressing was applied after preliminary sprinkling of the wound with sulphadiazine and penicillin powder. The dressing was usually changed after seven to ten days, when the healing cavity was repacked with a fresh alginate dressing. Both the wool and gauze were found to be satisfactory.

The Scottish Research Association, Messrs. Courtaulds Ltd., and Optrex Ltd. provided chemical information and materials for this trial.

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* Working with a Leverhulme research grant of the Royal College of Surgeons of England.

Reviews of Books

The Mechanism of Abdominal Pain

V. J. KINSELLA, CH.M., F.R.C.S., F.R.A.C.S., surgeon, St. Vincent's Hospital, Sydney. Sydney: Australasian Medical Publishing Co. 1948. Pp. 230. 32*s.* 6*d.*

IN this book Mr. Kinsella attempts to connect abdominal pain with particular nerve paths and to explain the phenomena of abdominal sensation anatomically. He begins with a historical outline of past research, which makes it clear how difficult the subject is. His main thesis is that pain nerves in the viscera are of splanchnic origin and do not differ essentially from sensory nerves elsewhere. Clinical experiments are cited which seem to show that inflamed organs are sensitive to pressure; but the explanation of why it is possible painlessly to cauterise and cut intestine or stomach withdrawn from the peritoneal cavity is not very convincing. The existence of an "irritable focus" substance acting in the central nervous system is postulated, but no evidence for it is brought forward except the argument of analogy. Clinically the author is undoubtedly right when he insists that deep tenderness is the best guide to the inflamed viscus. The later chapters, in which the pains of different diseases are explained in the light of the author's hypotheses, are very interesting.

The emotional make-up of different people is so different that their responses to pain are scarcely comparable; and the difficulty in arriving at truth in studies based on subjective expressions is extreme. This book, if it does not much advance the knowledge of visceral pain mechanism, is stimulating; and Mr. Kinsella's critical attitude to previous work will be a great help to anybody entering this field of investigation.

Present Status of the Surgical Treatment of Hyperthyroidism

WARREN H. COLE, M.D., professor and head of the department of surgery, University of Illinois; EDSON FOWLER, M.D., assistant in surgery in the department. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1948. Pp. 81. 10*s.* 6*d.*

THIS brief monograph comes from the department of surgery in the University of Illinois, Chicago. Though it does not attempt to cover the whole field of thyroid surgery, it effectively displays the more important features. The authors' aim has been to emphasise subjects of moment at the present time, and this they do without waste of words. The position of the antithyroid drugs is fairly and clearly summarised; though (unless the patients are carefully selected) it seems over-optimistic to suggest that more than half of those treated with propyl thiouracil will experience lasting remissions. The little said about the use of radioactive iodine in toxic goitre is not in its favour. Preoperative treatment is well described, as well as the criteria by which safety for operation is determined. The operative technique seems to differ little from that practised in Great Britain, and indeed the whole subject seems to have reached very much the same position in the United States as here.

Jaundice

Its Pathogenesis and Differential Diagnosis. ELI RODIN MOVITT, M.D., acting chief of medicine, Veterans Administration Hospital, Oakland, California. New York and London: Oxford University Press. 1947. Pp. 261. 42*s.*

A BOOK devoted to jaundice is particularly welcome at the moment because of the current widespread interest in disease of the liver, the recent extensive epidemics of infective hepatitis, and the importance of accurate diagnosis before treatment. The first part of this work, devoted to anatomy, physiology, and diagnostic procedures, is reliable and critical. Unfortunately though there are some 180 references at the ends of the chapters, the text mentions hardly any of them, and the reader is therefore left with no ready means of verifying such surprising statements as that "a number of individuals diagnosed as diabetes, and being treated as such, actually suffer from liver insufficiency rather than the insufficien of insulin," or that "the liver serves as the largest dep of vitamin C." Despite this, part I is a comprehensi and useful contribution to the literature on tests of li function. Part II, which gives a textbook description the three main types of jaundice—hæmolytic, parench matous, and obstructive—does not maintain the sa standard. The section devoted to toxic hepatitis is we and the relation of nutrition to liver disease is alm entirely relegated to a misleading footnote in which terms toxipathic and trophopathic are incorrectly us again without reference to original papers. A startli omission is the absence, in a long discussion of arsph amine jaundice, of any reference to syringe-transmitt hepatitis. Nevertheless the book as a whole conta information of great value to all responsible for the c of jaundiced patients.

Introduction to Diseases of the Chest

(3rd ed.) JAMES MAXWELL, M.D. Lond., F.R.C.P., ph cian, to the Royal Chest Hospital, and to the Minist Mass X-ray Unit. London: Hodder & Stoughton. 1 Pp. 308. 12*s.* 6*d.*

IT is seldom difficult to find technical faults i textbook for students: presentation of a subject sim logically, and without argument, inevitably invol some over-simplification. This book is not with such faults, but it is nevertheless a very good bo omitting little that is important. The present edit differs from the second chiefly in including radiogra as part of physical examination of the chest rat than as the first of the special investigations— enhancement of status designed to impress its importa on the student.

The opening chapters, dealing with history-taking physical examination, are particularly helpful, and i comforting to find so experienced and dogmatic author hedging a little over the exact significance bronchovesicular breathing. The ætiological classificati of such conditions as lung abscess and pleural effu are precisely what the student needs; that concern carcinoma of the bronchus is a fraction too sketc The illustrations, gathered together at the end in form of an atlas, make a moderately good representat collection.

First-Year Physiological Technique (London: Stap Press. 1948. Pp. 84. 7*s.* 6*d.*).—This excellent booklet written in so light a vein that it is tempting to make a lau tory pun on Dr. Alex Comfort's surname. There is a pennyworth on every page and no student should be without

Essays on Historical Medicine (New York: Frol Press. 1948. Pp. 220. $5.).—Dr. Bernard J. Ficarra's b is a series of essays on more or less related subjects—a p pourri of persons and events in medical history. In gene the outlook is surgical, and he gives pride of place to the ra progress of American surgery, more particularly abdomi surgery—progress dramatic in scope as well as in spe Among the more general essays the references to surgery Shakespeare claim attention, as do the details of famous m and women who have suffered from some physical disabil and yet overcame this and lived to benefit their fellow m

British Juvenile Courts (London: Longmans, Gr for the British Council. 1948. Pp. 44. 2*s.*).—Mr. John A. Watson begins his short book by citing the cases of a b of 13 hanged at Maidstone in 1831 for theft, and of another 9, sentenced in 1833, but not executed, for breaking a wind From this starting-point he describes the circumstances procedure of the modern English juvenile court, and disposal of offenders. The text is readable and accura and though it tends in places, especially in its choice illustrations, to become an apologia for the system it describ it will prove useful as a source of facts both in England a (as its publication for the British Council foreshado abroad. The author is himself a court chairman, and reasonableness and humanity of his attitude might well an object lesson to those who deal with adult offenders, wh the contrast with 19th century penology is less evide The Lord Chancellor, Viscount Jowitt, contributes a judici preface.

THE LANCET

LONDON: SATURDAY, OCT. 23, 1948

Prefrontal Leucotomy

"PSYCHIATRISTS have been consistently pessimistic about modern physical methods of treatment of mental illness, and consistently wrong," said Dr. DESMOND CURRAN in his Croonian lectures to the Royal College of Physicians last week. Among such methods, prefrontal leucotomy, first done in Lisbon in 1935, has now a long enough history to justify some assessment of its value. Experience has shown that the plane of the cut is important. If too far back it may cause profound stupor, severe personality changes, or even death; and the most satisfactory plane proves to be just in front of the tip of the anterior horn of the lateral ventricle, in about the line of the coronal suture. Dr. ALFRED MEYER, who, at the London County Council's Central Pathological Laboratory, has examined a number of brains in which the operation has been done, has found great variety in the site of the cut; only 10–15% of the corticothalamic fibres may have been divided, and in one case the surgeon had failed to hit the brain at all. The mortality is low, however, and was given in the Board of Control report on prefrontal leucotomy[1] as 3 per 1000. Convulsions are an occasional sequel, but are usually isolated, and seldom persist beyond eight months after the operation. Dr. CURRAN mentioned two patients with idiopathic epilepsy who had no further fits after prefrontal leucotomy. Other occasional sequels are temporary urinary or rectal incontinence, apathy, and transient disorientation. The blood-pressure falls somewhat, and stays a little lower than before operation, even in hyperpietics. The appetite improves, and there may be a period of gross overeating. The patient commonly looks younger and handsomer, and sexual desire is increased, though it usually returns to normal within about a year. A severe reaction after the operation does not necessarily mean a bad prognosis: on the contrary, it almost seems to carry a good one. Common reactions are apathy, irritability, confusion, euphoria, or restlessness; but these gradually wear off, especially if the patient is given opportunity for reablement. W. FREEMAN and J. W. WATTS relate the response to the previous personality of the patient, and to the plane of the cut—finding that euphoria is associated with a forward cut, and apathy with a cut placed far back. The inertia gradually wears off, however, and often gives place to a shallow, cheerful, prankish mood. The attitude of the patient towards incontinence is objective. "What's the weather like with you?" asked one, passing water while she telephoned. "It's raining here."

Dr. CURRAN noted that American opinion is less optimistic than British opinion about the results of the operation. Americans emphasise the fatigability of these patients, their shallowness, and their lack of perseverance; but in Dr. CURRAN's experience these drawbacks are commonly less after six months, and FREEMAN and WATTS found some of their cases doing better after five years than after two. The patients have less capacity for self-blame, and in their work they favour speed before accuracy. F. L. GOLLA holds that their power of ethical evaluation is impaired. Ultimately, however, the success of the operation turns on how the patient feels, what he can do, and what others make of him. His behaviour and capacity must be compared with these things before operation, and his capacity for social relationships must be discovered by asking his friends about him. If they complain that he is not perfect it is well to remember that people in whom the corticothalamic tract remains undivided are not always easy to live with, and that a satisfactory family is necessary for a good recovery. Jewish patients often respond well because family feeling is strong among the Jews. A relatively imperceptive husband or wife, one not easily perturbed by trifles, is a great standby. Those who report, for instance, that a patient was "aggressive" after leucotomy tell nothing unless they say whether his family minded his aggressiveness. Relatives can often estimate the meaning of a patient's behaviour better than the doctor can; and they may be especially helpful when operation is being contemplated, since they can judge whether the patient is suffering real distress of mind or not. Dr. CURRAN mentioned the case of a complaining patient whom he took to be feeling little genuine distress till a member of her family said: "She's not querulous for the sake of being querulous, but because she is anxious and afraid." Emotional tension is the main indication, and the prognosis is related to its degree —to the "amount of tortured self-concern" the patient suffers. Nevertheless some schizoid patients who show little sign of emotional tension respond well —evidence that despite their outward calm their emotional response to their ideas is still strong. A deteriorated schizophrenic, on the other hand, "looks and acts the same with or without his frontal lobes." The prepsychotic personality has some bearing on the result. Those who had a cruel streak, or sought refuge from responsibility, possibly in alcohol, often do badly. The operation has been used in an attempt to reduce the restlessness of hyperkinetic mental defectives, but without much success; those who improved relapsed quickly. On the whole, the better the intelligence the better the result.

It is noteworthy that in America the operation, though not greatly valued for mental states, has been used considerably in the treatment of intractable pain—for instance, the pain of incurable cancer. Though it does not ease the pain, leucotomy may free the patient from the dread of it, and for some reason he then finds it altogether more bearable. New versions, including transorbital leucotomy[2] and ablation of part of the frontal lobes, are still on trial.

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[1] Prefrontal Leucotomy in 1000 Cases. London: H.M. Stationery Office. 1917. See *Lancet*, 1947, i, 265, 258.

Advances in Microscopy

IN the last fifteen years three new methods of microscopy have been developed which promise great advances in our knowledge of biological fine structure. The principles of phase-contrast microscopy were demonstrated by ZERNIKE in Holland in 1934; the first practical compound electron microscopes were built by RUSKA and MARTON in the *same year;* and since 1943 BURCH has constructed the first high-performance reflecting microscope.

With the development of the apochromatic objective in 1878 the lens microscope rapidly attained a performance approaching its theoretical limits. Oil-immersion lenses with numerical apertures approaching 1·5 can resolve objects down to a *third* of the wavelength of light—for sodium light this would correspond to a particle diameter of 2000 Å, or 0·2 μ. By using ultraviolet light of shorter wavelength the resolving power can be further improved to below 1000 Å; but, since glass is opaque to ultraviolet, quartz-fluorite lenses have to be used. Unfortunately, these lenses are monochromatic, so they can only be used for photomicrography and accurate focusing requires a series of trial-and-error exposures. The limit of this technique is set by the opacity of the objective in the far ultraviolet region. However, many biologically important compounds (*e.g.*, nucleic acid) strongly absorb ultraviolet light of selected wavelengths, and the U.V. microscope has therefore proved valuable for qualitative and quantitative estimations of such materials within the cell. This method has been widely used in studies of malignant cells, and such studies can be made on the living cell.

The phase-contrast microscope is also particularly valuable in the study of living cells, though in resolving power it is no better than the normal lens system. When a completely transparent colourless object is viewed in the ordinary microscope, differences in refractility in parts of the object are visible only at the *boundaries* between the regions of different refractive index. In this way the nucleus, chromosomes, cilia, and flagella are seen bordered by light or dark lines. Under phase-contrast illumination the effect produced is that of staining all refractile objects with a neutral grey tint whose depth is a measure of the refractility of the object. The internal details of many of these refractile bodies can be studied; vacuoles in a flagellum and chromosomes in the nucleus are often clearly seen. Phase-contrast illumination can be adapted to any ordinary microscope, but it requires a special condenser and objective. The condenser has an annular stop, so that a ring of light is brought to a focus at the back of the objective. The "phase-plate" in the objective is a flat glass plate with an annular channel a quarter of a wavelength in depth cut in its surface; the plate is so placed that the image of the condenser annulus falls exactly in the groove, and the groove is darkened to absorb part of this undiffracted light which passes through it. Diffracted light from the object passes through the remainder of the phase-plate; it is th interference of the undiffracted and diffracted beam which produces the *intensity differences* in the fin image. This method of examination is not suitab for thick layers of tissue, thick cells, or cells whos *cytoplasm* is densely packed with refractile granule But individual cells in tissue-culture are ideal objec for it; cilia and flagella give clear "solid" image and not fictitious diffraction patterns; the structur of striated muscle-fibres and banded chromosom is sharply defined; and bacteria, spirochætes, an similar bodies are revealed almost as well as by dark ground illumination. HUGHES and BARER hav shown some of the possibilities of this method i their studies of cell division and the structure muscle-fibres.

The new reflecting microscope which Mr. C. BURCH, PH.D., F.R.S., is working on at Bristol ove comes many of the defects inherent in a lens micr scope.[1] The mirror objective is completely achr matic and has a minimum of spherical aberration, wit *an effective numerical* aperture of 0·65, but it h a working distance of nearly 2 cm. These featur give it the optical performance of a 4 mm. le objective with the working distance of a lo power binocular. The advantages of this in studi employing microdissection or involving high temper tures and pressures can readily be appreciated. A *oil-immersion component can be added to raise* th numerical aperture to 0·98, and future models a projected with the resolving power of a norm 2 mm. oil-immersion lens. These achromatic systen have the enormous advantage of complete inte changeability of visual and ultraviolet illuminati sources, without change of focus. Since the reflecti *power of a mirror surface can extend into* the far ultr violet, well beyond the limits of a quartz-fluorit lens, the resolving power of this new microscop promises effective magnifications several times thos achieved with the U.V. lens microscope. The reflectin microscope is at present an elaborate and exceedingl costly apparatus. So far its gourd-shaped mirror have required more than 100 hours of skilled an accurate hand-polishing, but the problem of shapin them mechanically is being energetically studie The achromatic characteristics of these microscope are likely to find their most valuable application i absorption spectrophotometry of living and fixe material.

The electron microscope *owes its origin* to the fac that narrow conical pencils of electrons moving a high velocity can be focused by magnetic or electro static fields precisely as light is focused by a len system. The electrons are emitted by a hot fila ment and are accelerated along the microscope by high-voltage source. Very accurate *control of* th voltage produces a "monochromatic" beam o electrons of constant velocity. Most modern electron microscopes use magnetic lenses, which are short solenoids with accurately ground *internal pole-pieces*; the focal length of the lens can be altered by varying the current passing through the solenoid, so a large *range of magnifications can be achieved* with a single lens system. *The numerical aperture of the objective* only about 0·001, but, since the equivalent electron wavelength is 5×10^{-10} cm., this gives a resolving power of 50 Å—some forty times better than the best results with the optical microscope. Experimental models have been built to resolve 10 Å, which should make visible spherical molecules consisting of about [illegible] atoms. The possibilities of the instrument for biological research are therefore enormous. That it has not yet realised the dreams which it first inspired is due to difficulties in the preparation and mounting of the specimen, which must be less than ·1 μ thick and, since the microscope is evacuated to a very low pressure, must also be completely dry. Thick specimens absorb too much of the energy of the beam, and, apart from their consequent opacity, may be destroyed by the heat which is liberated in them. For this reason the most successful electron micrographs have been of such subjects as viruses, bacteria, flagella, and small muscle and tendon fibres. These are usually examined dried on a thin film of plastic. For larger objects it has been necessary to develop new methods of preparing very thin sections. The ordinary microtome will cut sections of 1–2 μ with difficulty; below this limit the plastic flow of the embedding medium prevents the knife from cutting. By using cutting speeds of several hundreds of feet per second, the knife blade being mounted on a high-speed flywheel, objects embedded in wax or camphor can be cut sufficiently thin for observation in the electron microscope. Artefacts produced in the specimen on drying, which denatures the proteins and destroys much of the characteristic structure, cannot be readily eliminated. "Freeze-drying" by the Altmann-Gersh technique is one possibility; here the material is frozen in isopentane cooled to −180°C and is dried by vacuum evaporation of the ice at −30 to −70°C under a pressure of 0·0001 mm. Hg. Attempts have also been made to mount the living specimen in an airtight cell, permitting it to be examined wet, though so far with little success.

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[1] Nuffield Foundation. Report of the Trustees for the Year Endin 31 March, 1948. Oxford, 1948; p. 21.

[2] Freeman, W. *Lancet*, Sept. 4, p. 371.

Owing to the very low aperture of electron lenses their depth of focus is enormous—greater than the thickness of the specimen examined. There is therefore no "modelling" or depth effect in the photographs; overlapping fibres, for example, merely appear denser at the point where they cross. This difficulty can be overcome either by rotating the specimen holder and taking stereo-electronmicrographs, or by an elegant shadow technique which is becoming widely used. The object is placed in a high vacuum and obliquely bombarded with a rectilinear stream of heavy metal atoms. When examined afterwards in the electron microscope the deposit of heavy metal appears as a fictitious "shadow" reproducing very accurately the relief of the specimen. (Since the deposit of gold atoms represents the "light" and not the "shadow," it is usual to print the photographs obtained in their negative form.) A technique equivalent to that of histological staining is being developed. Normal stains are not significantly different in opacity from the rest of the tissue, but heavy metal compounds, preferentially absorbed at certain points in the structure, can be readily seen in the electronmicrograph because of their high density. There is a wide field here for further work on the intimate—one might almost say ultimate—structure of the molecular complexes present in biological systems.

Recovering from Tuberculosis

A CONVALESCENT patient, returning to the sanatorium after three days' absence on urgent business, said, "My friends are going to be my downfall, I can see." Bronzed, a stone heavier, and looking as if he had spent his year on a world cruise, he had been greeted with back-slappings (on his A.P. side), nudges (in his pneumoperitoneum), loud cries for drinks all round, and entreaties to make a night of it. It was a new experience for him to have to play the wet-blanket; and he hated it. How long had he got to be "odd man out"?

No guarantee can be given to a convalescent tuberculous patient that he will never break down again. But if he can maintain good health with freedom from all signs and symptoms of active disease for five years he will be able to regard himself as "cured." The maintenance of good health will depend almost entirely on his observance of self-imposed restrictions; and five years is a large slice of life to spend walking delicately, especially for a person who shows no visible stigma of disease or disability, who feels well in himself, and who perhaps has social or economic reasons for wishing to conceal his true condition. The tests of graduated exercise at the sanatorium will have determined to some extent how much exertion he ought to undertake each day to begin with; and the rules of rest and relaxation will have been learned, practised, and acquired as habits—rules such as avoiding "getting out of breath," going to bed early, keeping statutory "rest hours" during the daytime, and, above all, resting whenever tired. These habits are easy enough to observe in a community where everybody else is observing them: it is when the patient gets home that his moral fibre is tested. How can he be helped? At this point it is essential to discover what circumstances brought about his illness. His work? His leisure? Or his whole attitude towards the business of living? This is a most important question, for on its answer depends his successful reablement—and prognosis.

Sometimes it is possible to contrive a change from an uncongenial job to one less exacting and more satisfying. But not often. As a general rule it is far better for the patient to return to the job he understands—so long as he does not positively detest it—than to switch to a new job with its new worries and uncertainties: a clerk is better advised to return to his office stool than to embark on the more hygienic hazards of poultry-farming. Naturally, at first he will only be able to engage in part-time work, and his hours should be arranged so that he arrives late and leaves early, thus avoiding the rush-hours on trams, tubes, and buses. Every effort should be made to enable him to lunch in comfort and to break his working hours with a proper "feet-up" rest during his lunch interval. With the present labour shortage, employers are more willing than ever to make such concessions, even for the less highly placed members of their staffs.

But the 40-odd hours per week spent at work are a far smaller source of danger than the 120-odd hours of so-called leisure and the tensions caused by the many claims of interpersonal relationships during these hours. For many men and women life begins after the day's work is done. Shortage of help in the home spells a full-time burden for the home-maker. Can either husband or wife bear to lie with the feet up and refrain from lending a hand while the other is cooking, washing up, and getting the children off to bed ? Yet this must be the rule for many months to come, and both husband and wife will have to face and accept the fact light-heartedly. The doctor can help to prevent emotional stress by forewarning the couple of this situation in all its details, and so to speak rubbing their noses in it. And there are also the claims of friendships and entertainments outside the home. Many men and women are dependent on their friends and fulfil themselves best in social pleasures. Are these to be abandoned ? Clearly there must be a compromise. Life without visits from friends, occasional movies, or darts at the local may be so depressing as to undermine morale. Besides which, no patient must be allowed to "live for his disease ever after"—a tendency sometimes to be observed in the obsessional type who in pure culture will literally count his steps and order his life with a stopwatch.

Quite often it was nothing out of the ordinary in the patient's circumstances, but rather his attitude towards them—his modus vivendi—which produced his breakdown. This was what happened (we understand) to the writer of one of the two articles on tuberculosis in our Disabilities series.[1] All his life he had shown obsessional tendencies which led him into over-conscientiousness at his work and at his play. Not content with working at his own job during office hours he was always ready to shoulder those of others ; moreover he got into the habit of taking work home with him and utilised the quiet small hours for paper-work instead of sleep. Meals became an unwelcome interruption and represented so many valuable hours wasted in cooking, table-laying, and washing up (for he was equally conscientious at helping his wife in the home) that he did his eating with one eye on the clock. His weekend gardening became a "fatigue," in both senses of the word, instead of a pleasurable recreation. He always had to be getting on with something. Idleness irked him : unless he complied with every condition in Kipling's *If* he could not regard himself as a man. And unfortunately this pathological attitude towards life, with its continual spur of depressing guilt-feelings, is regarded by the world as admirable and something to be encouraged—in other people. The addict also thinks it highly virtuous, and must be taught otherwise. Happily, mere common-sense discussion will usually do much for him, since, like Grosvenor in *Patience*, he is often very ready to change his ways if enough pressure is brought to bear from outside. His duty, of course, is to survive as long as he can as a wage-earner ; and that will not be achieved by flogging himself along in a manner "the like of which he wouldn't treat a horse."

It will be seen that there are few hints and tips of a physical nature for the tuberculous, such as there may be for the one-armed, the arthritic, or the hemiplegic. The tuberculous patient has to *acce* his disability ; which involves reaching a certai attitude of mind. The factors in his life which precip tated or contributed to his breakdown must b altered, as far as is humanly possible, by change job, marriage with the right person, or the adoptio of a quieter mode of living. But if the operative facto cannot be altered, his reaction to them must b changed. More often than not the months which th patient has spent withdrawn into a sanatorium hav wrought a change by the time he leaves. Thing have a way of settling themselves if given tim and for his part the patient has had ample opportuni for introspection, drawing up a spiritual balance-shee and determining his future policy. Should his problem be insoluble it is highly improbable that he wi ever reach convalescence.

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[1] July 10, p. 75 ; Sept. 25, p. 507.

Annotations

THE PRENTICE PRACTITIONER

In its report the first Spens Committee showed its *keenly alive to the value of an assistantship in t* training of general practitioners, adding that "even the doctors who intend to become specialists would bene from a year spent as an assistant in general practice." Following the spirit, if not the letter, of the Spe recommendations, the Ministry of Health has p forward *a scheme of grants to practitioners for traini* young assistants. It is proposed that any princi wishing to take an assistant for training shall app for approval to the local medical committee, which to consult two nominees of the neighbouring universi To qualify for a grant the practitioner must have at lea *2000 patients on his list ; he may not increase his l* beyond the maximum that would be permitt if he did not employ an assistant under the schem and he may engage only one assistant at a time in th way. To benefit by a grant (which is restricted to on year) assistants must not previously have been in gener practice in the British Isles except for short periods a locum tenens.

The Ministry suggests that the principal shall recei £150 as a training fee, a sum not exceeding £700 f the assistant's salary and boarding expenses, and a c allowance of up to £150. These financial provisions *not satisfy the Insurance Acts Committee,*[2] which objec that since the maximum number of patients is not t be increased in respect of the assistant in training, is clearly to be regarded as a student rather than a employee (though this was not made clear when th figures first appeared). Yet from the £700—which w be passed on to the assistant, possibly with additions the principal is expected to find the employer's contr bution to National Insurance and superannuatio amounting in all to some £60 ; and the assistant woul still have to pay his own contributions. The Ministry reply is that a trainee should receive less than an exper enced assistant, who, according to current advertisement can expect £700–800 a year ; and both the principal and the assistant's contributions to insurance an superannuation would rank for income-tax allowanc Moreover, advertisements set an assistant's car allowanc at £100, and the proposed maximum of £150 i generous.

This retort does not seem unreasonable. The £100 o so which, by the committee's reckoning, *must com*

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1. Report of the Interdepartmental Committee on Remuneratio of General Practitioners. *Cmd. 6810.* H.M. Stationery Offic 1946 ; p. 9.
2. *Brit. med. J.* Oct. 16, suppl. p. 140.

[illegible] the practitioner's own pocket or from the training [illegible] has to be set against the probable advantages of ring twelve months' qualified assistance. Similarly, [illegible] young assistant should not resent getting slightly [illegible] than his seniors in similar posts, provided the [illegible] is spent in apprenticeship to a worthy master. bly the number of established practitioners will iderably exceed the number of juniors wishing to il themselves of the scheme. This should ease the l medical committee's task of ensuring that grants [illegible] paid only to principals willing and able to assume [illegible] rôle of tutor; and the presence on the committee university representatives (which has been criticised eedless intervention) may relieve the embarrassment eliminating claimants from a local group.

PSYCHOGENIC RHEUMATISM ?

"It is better to attribute incorrectly a small percentage of organic illnesses to functional causes than to condemn a large number of healthy patients to the fear of a nonexistent disease."[1]

f. Philip Hench, of the Mayo Clinic, speaking on ychogenic rheumatism at the West London *Hospital*, Oct. 12, was much of Dr. Armstrong's opinion. Pains ich the patient calls rheumatic, yet which are not ociated with organic evidence of rheumatism, are fact "body language," he considers—mental pain d anguish experienced as bodily pain. The idea of ychological factor in rheumatism is not new; indeed, denham (as Dr. W. S. C. Copeman recalled) mentioned [illegible] that, were it not for other factors, "might pass a sort of hysteria." The question is whether the se agent, whatever it may be, can ever be left irely out of account. Taking the layman's definition rheumatism as "any ache or pain within half a mile a joint," Professor Hench thinks there are cases in ich it can—cases caused entirely and primarily by [illegible] and frustrations, and often confirmed by injudicious ent ("iatrogenic fixation").

[illegible] rheumatologist can exclude osteo-arthritis and atoid arthritis if their physical signs and radio- ic changes are absent. Fibrositis gives more trouble, [illegible] also has specific characteristics. The patient with sitis tells a plain tale plainly: his pain is a localised [illegible] accompanied by stiffness, causing fatigue, worse the morning and evening and after rest, and affected changes of weather; heat, physiotherapy, and lates relieve it for a time, but it can force its way his attention through any distraction or preoccupation. e patient with psychogenic rheumatism tells a dif- ent story, and tells it in a tense defensive manner: e pain is indescribable, "like" so-and-so, or tingling, ming or stabbing, or it is a strange feeling; it is ten not localised but felt "all over"; fatigue makes worse, but it is often bad all the time, or worse at egular times, not at the ends of the day or related changes of weather, though often associated with otional stress; heat and physiotherapy are quite ely to make it worse, and salicylates are usually effective; he forgets it when his attention is engaged t then he "pays for it later." Thus there are many sitive evidences for a diagnosis of psychogenic rheu- tism; and Professor Hench was able to offer one ore: "when I find myself getting mad at a patient, I know that either I have a migraine coming on, or the atient has psychogenic rheumatism."

Dr. A. Spencer Paterson was unwilling, as a psychiatrist, to accept this massive gift of patients into his ecialty; and put forward the claims of the rheumatic irus. The history, he said, often discloses evidence of rheumatic infection earlier in life—tonsillitis, chorea, or streptococcal infections. It may be that rheumatic infection has rendered these patients unfit for ordinary life, their mental symptoms being a result of rheumatism rather than its cause. The form which neurosis takes in a community is spread by suggestion, and possibly in America the favourite among patients just now is psychogenic rheumatism; but here, whatever may have gone on in Sydenham's day, our duty is still, he thinks, to try to apportion the blame fairly between the rheumatic agent and the trials and errors of the maladjusted victim.

SHEEP STREET

AN advertisement in our issue of Oct. 9 said:

> "As a result of the recent death of a doctor on the Medical List of the Birmingham Executive Council there is a vacancy at 6, Sheep Street, Birmingham, 4, and 80, Great Lister Street, Birmingham, 7, for a doctor who wishes to undertake general medical services. . . . The owners of the properties are prepared to make available to the incoming doctor living and surgery accommodation, and the Council will require the doctor to live at the premises, No. 6, Sheep Street."

Admittedly, at the present time, most doctors entering general practice are glad enough to occupy any existing living and surgery accommodation. But in principle it is surely quite wrong that an executive council should insist that an incoming doctor must live at a stipulated address. The council has every right to require that the doctor shall live and practise near the patients whose care he agrees to accept; but any more precise condition seems hard to defend. However suitable and attractive the house in Sheep Street may be, it should not be made the only possible home for the new doctor. For a thousand and one reasons he may prefer the house next door or the rooms around the corner, and he should be allowed to exercise his reasonable choice.

In these times when traditional relationships in practice have been suddenly uprooted—when doctors are seeking new and non-financial ways of selecting professional colleagues, and ensuring amicable and effective coöperation in the health service—it is essential not to accept rulings that may later restrict our freedom of action, or our width of choice. While recognising that it is well within the competence of any executive council advertising a vacancy to state that it will give preference to a candidate willing to accept certain conditions of service, we cannot feel that it is in the interests of the community or of the profession that a council should lay down so definite a condition as to state the very house the doctor must occupy. In so doing it may incidentally restrict its own choice of applicants to those who allow themselves, by necessity, indolence, or inclination, to be herded to Sheep Street.

B.C.G. FOR NURSES

Dr. J. Heimbeck[1] has brought up to date his study of tuberculosis in nurses at the Ullevaal Hospital since 1924. In the first three years it was shown that the disease developed far more frequently among the Pirquet-negative than among the Pirquet-positive. From 1927 onwards the nurses were classified in three groups according as they were, at the beginning of their nursing careers, (1) Pirquet-positive, (2) Pirquet-negative, or (3) Pirquet-negative and thereupon B.C.G.-vaccinated. Of 501 vaccinated with B.C.G., 49 developed tuberculosis and 5 died of it. This gives 9·8% morbidity and 1% mortality. The Pirquet-negative nurses not vaccinated with B.C.G. showed, however, a 37·3% morbidity and 4·2% mortality from tuberculosis. Since 1932 Dr. Heimbeck has classified his B.C.G.-vaccinated nurses according as they did or did not become Pirquet-positive in response to B.C.G. By 1948 he could show that of 341 nurses rendered Pirquet-positive by B.C.G. only 19 developed tuberculosis, and only 1 died of it, whereas among 115 nurses who remained Pirquet-negative after

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1. Armstrong, T. G. *Lancet*, 1946, ii, 480.

1. *Tidsskr. norske Lægeforen.* Sept. 15.

of so-called leisure and the tensions caused by the many claims of interpersonal relationships during these hours. For many men and women life begins after the day's work is done. Shortage of help in the home spells a full-time burden for the home-maker. Can either husband or wife bear to lie with the feet up and refrain from lending a hand while the other is cooking, washing up, and getting the children off to bed? Yet this must be the rule for many months to come, and both husband and wife will have to face and accept the fact light-heartedly. The doctor can help to prevent emotional stress by forewarning the couple of this situation in all its details, and so to speak rubbing their noses in it. And there are also the claims of friendships and entertainments outside the home. Many men and women are dependent on their friends and fulfil themselves best in social pleasures. Are these to be abandoned? Clearly there must be a compromise. Life without visits from friends, occasional movies, or darts at the local may be so depressing as to undermine morale. Besides which, no patient must be allowed to "live for his disease ever after"—a tendency sometimes to be observed in the obsessional type who in pure culture will literally count his steps and order his life with a stopwatch.

Quite often it was nothing out of the ordinary in the patient's circumstances, but rather his attitude towards them—his modus vivendi—which produced his breakdown. This was what happened (we understand) to the writer of one of the two articles on tuberculosis in our Disabilities series.[1] All his life he had shown obsessional tendencies which led him into over-conscientiousness at his work and at his play. Not content with working at his own job during office hours he was always ready to shoulder those of others; moreover he got into the habit of taking work home with him and utilised the quiet small hours for paper-work instead of sleep. Meals became an unwelcome interruption and represented so many valuable hours wasted in cooking, table-laying, and washing up (for he was equally conscientious at helping his wife in the home) that he did his eating with one eye on the clock. His weekend gardening became a "fatigue," in both senses of the word, instead of a pleasurable recreation. He always had to be getting on with something. Idleness irked him: unless he complied with every condition in Kipling's *If* he could not regard himself as a man. And unfortunately this pathological attitude towards life, with its continual spur of depressing guilt-feelings, is regarded by the world as admirable and something to be encouraged—in other people. The addict also thinks it highly virtuous, and must be taught otherwise. Happily, mere common-sense discussion will usually do much for him, since, like Grosvenor in *Patience*, he is often very ready to change his ways if enough pressure is brought to bear from outside. His duty, of course, is to survive as long as he can as a wage-earner; and that will not be achieved by flogging himself along in a manner "the like of which he wouldn't treat a horse."

It will be seen that there are few hints and tips of a physical nature for the tuberculous, such as there may be for the one-armed, the arthritic, or the hemiplegic. The tuberculous patient has to *accep* his disability; which involves reaching a certai attitude of mind. The factors in his life which precip tated or contributed to his breakdown must b altered, as far as is humanly possible, by change job, marriage with the right person, or the adoptio of a quieter mode of living. But if the operative facto cannot be altered, his reaction to them must changed. More often than not the months which th patient has spent withdrawn into a sanatorium hav wrought a change by the time he leaves. Thin have a way of settling themselves if given tim and for his part the patient has had ample opportuni for introspection, drawing up a spiritual balance-shee and determining his future policy. Should his problem be insoluble it is highly improbable that he w ever reach convalescence.

Annotations

THE PRENTICE PRACTITIONER

IN its report the first Spens Committee showed its keenly alive to the value of an assistantship in t training of general practitioners, adding that "even th doctors who intend to become specialists would bene from a year spent as an assistant in general practice." Following the spirit, if not the letter, of the Spe recommendations, the Ministry of Health has p forward a scheme of grants to practitioners for traini young assistants. It is proposed that any princi wishing to take an assistant for training shall ap for approval to the local medical committee, which to consult two nominees of the neighbouring universi To qualify for a grant the practitioner must have at le 2000 patients on his list; he may not increase his l beyond the maximum that would be permitt if he did not employ an assistant under the schem and he may engage only one assistant at a time in th way. To benefit by a grant (which is restricted to o year) assistants must not previously have been in gen practice in the British Isles except for short periods a locum tenens.

The Ministry suggests that the principal shall rece £150 as a training fee, a sum not exceeding £700 f the assistant's salary and boarding expenses, and a c allowance of up to £150. These financial provisions not satisfy the Insurance Acts Committee,[2] which obje that since the maximum number of patients is not be increased in respect of the assistant in training, is clearly to be regarded as a student rather than employee (though this was not made clear when t figures first appeared). Yet from the £700—which w be passed on to the assistant, possibly with additions the principal is expected to find the employer's cont bution to National Insurance and superannuatio amounting in all to some £60; and the assistant wou still have to pay his own contributions. The Ministry reply is that a trainee should receive less than an expe enced assistant, who, according to current advertisement can expect £700–800 a year; and both the principal and the assistant's contributions to insurance an superannuation would rank for income-tax allowanc Moreover, advertisements set an assistant's car allowanc at £100, and the proposed maximum of £150 generous.

This retort does not seem unreasonable. The £100 o so which, by the committee's reckoning, must com

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[1] July 10, p. 75; Sept. 25, p. 507.

[1] Report of the Interdepartmental Committee on Remunerati of General Practitioners. Cmd. 6810. H.M. Stationery Offic 1946; p. 9.

[2] *Brit. med. J.* Oct. 16, suppl. p. 140.

[illegible] and pulseless for days and then reduces [illegible] chance by bleeding, and patients with con[illegible] heart-failure, coronary thrombosis, or opium [illegible]. He recalls, too, that a man may show [illegible] signs of a fatal disease without having any [illegible] signs of *impending* death; and indeed, if the [illegible] divests his mind of the thought that the man's [illegible] is incurable, he will find the accepted signs and [illegible] of impending death to be extremely unreliable. [illegible] more, Lord Horder says, about the act of [illegible] than about death itself, and may be hard put [illegible] to say when death actually takes place. He is [illegible] clear about the doctor's duty when it comes to [illegible] dying people die: there is little to be said for a [illegible] who officiously prolongs for his patient the [illegible] dying. Dr. Barber writes with experience of [illegible]surance and support which a good doctor can [illegible] to a dying man and his relatives. Belonging to [illegible] Johnsonian school, he is evasive when the patient [illegible] whether recovery is possible—differing in this from [illegible] Leak, who favours "a quiet straight answer with a [illegible] look in the eye." Since the patient's preference [illegible] this matter is probably a matter of temperament, [illegible] physician will be he who at the moment of [illegible] knows whether to answer as a Barber or a Leak.

Mr. Leak's tactful enthusiasm for embalming has a [illegible] hygienic background, and he reminds us that [illegible] funeral director and his colleagues face some risk to [illegible] in their calling. The body of a tuberculous patient, [illegible] a patient dying of sepsis, may endanger those [illegible] task it is to prepare them for burial, unless tech[illegible] is well designed and careful. The British Institute [illegible] Embalmers has established a research board to inquire [illegible] possible dangers, to the living, from dead bodies; [illegible] funeral directors use their judgment about [illegible] for embalming, regarding the process as a public [illegible] and providing it, when necessary, without regard [illegible] financial status of their clients—a piece of public [illegible] perhaps generally recognised.

ŒSTROGENS IN DIABETES

[illegible] insulin is specific in the treatment of [illegible] there is evidence that some extrapancreatic [illegible] factors may augment its effect and reduce [illegible] insulin requirements. Marcus and Glotzer[1] [illegible] a reduction in the severity of diabetes in post[illegible] patients treated with œstrogenic hormone. [illegible] 7 bedridden subjects chosen, aged 62–77 years, [illegible] had either been present before the menopause [illegible] been aggravated by it. An adequate control [illegible] before treatment is essential, and the diet and [illegible] requirements of these patients were unchanged [illegible] a preliminary observation period of at least five [illegible]. After this, 6000 rat units of œstrogenic hormone [illegible] B') was injected intramuscularly twice [illegible] for three months. A fall in daily insulin require[illegible] of 25–50% was observed in 4 of the patients. There [illegible] also an almost precipitous fall in blood-sugar in [illegible] patients, after four weeks in 5 cases and at the [illegible] week in the remaining one. All the patients [illegible] a "remarkable feeling of well-being," and only [illegible] had uterine bleeding.

[illegible] hormone may exert its effect indirectly [illegible] depressing the secretion of diabetogenic hormone by [illegible] lobe of the pituitary; this view is sup[illegible], for example, by Biro's[2] recent report in these [illegible] of symptoms of hypoglycæmia in patients [illegible] stilbœstrol. However, in previous studies of [illegible] aspects of diabetes, with particular [illegible] to the liver, Biskind and Schreier[3] found [illegible] diabetics not only signs and symptoms of vitamin-B complex deficiency but also syndromes related to excess œstrogen. Intensive nutritional therapy benefited most of these cases, suggesting a correlation between the lesions of nutritional deficiency and impairment of the œstrogen-inactivating mechanism of the liver. These results conflict with the other work mentioned above, but further carefully controlled clinical trials may show, as Marcus and Glotzer hope, that in suitable cases œstrogenic hormone therapy has a place as an adjunct to, or substitute for, insulin.

WAR CASUALTIES

THE Ministry of Pensions' year-by-year account[1] of war casualties, with the varying proportions between the Forces, the Mercantile Marine, and the Civil Defence Services and civilians, reflects in grim outline the actual course of military events. It also reflects a growing sense of obligation to those killed or injured in war. In progressing by short stages it is easy to think that we are hardly moving at all; but by compressing its story of the last nine years into a single report the Ministry shows that step by step we have travelled far from the outlook of 1939. Whereas then the minimum payment to a severely disabled pensioner who had married after being disabled, and had two children, was £1 12s. 6d. it is now £5 11s. Increases derive partly from an improvement in pre-existing allowances, and partly from fresh supplements such as those for unemployability and special hardship. The most notable change of principle in the reckoning is the acknowledgment that a wife married, or children born, after disablement should count for allowances. With increase in their amount, there has been a parallel relaxation in the rules governing the grant of pensions. Thus in 1943 it was laid down that no onus to prove his case should rest on the claimant, who was to have the benefit of any reasonable doubt. Though refusing to accept the principle expressed in the slogan "fit for service, fit for pension," the Government ruled that a Serviceman invalided with a disability not noted on entry to the Forces should receive a certificate of entitlement in the absence of evidence that the disablement was not related to service. This has opened the way to thousands of successful claims which previously would have been rejected.

In these and other changes successive Governments have sometimes led, and at other times followed, national opinion. Wherever the credit may lie, the movement is in the right direction.

THE DISTINCTION AWARDS

THE third Spens Committee recommended that "distinction awards" in three grades should be made to consultants and specialists in recognition of special contributions to medicine, exceptional ability, or any outstanding professional work (other than administrative). These awards, it was suggested, should be made by "a national committee consisting in the main of eminent members of the profession who from their own knowledge or otherwise would be able to reach an authoritative opinion on the comparative merits of candidates." The Ministry of Health last week announced that the Government, in reviewing the Spens report, have decided to set up such a committee, and that its constitution has been settled after consultation with the Royal Colleges and Scottish Royal Corporations. "Invitations to the individual members," it is stated, "will shortly be issued," and a full announcement will be made when the details have been completed.

WE regret to record that Mr. PERCIVAL COLE, consulting surgeon to the Royal Cancer Hospital, London, died on Oct. 19.

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[1] [illegible] H., Glotzer, S. N.Y. St. J. Med. 1945, 45, 1461.
[2] [illegible] G. Lancet, Sept. 25, p. 512.
[3] [illegible] M. S., Schreier, H. Bull. N.Y. Acad. Med. 1945, 21.

[1] Ministry of Pensions: 23rd Report, for the period April 1, 1939, to March 31, 1948. H.M. Stationery Office. 1948. Pp 45. 1s.

B.C.G. vaccination 27 developed tuberculosis and 4 died of it. (There remained 45 nurses not kept under close observation.) Thus a comparison between Pirquet-negative nurses who were not vaccinated and Pirquet-negative nurses whom B.C.G. made Pirquet-positive shows that the tuberculosis morbidity were seven times higher in the former than in the latter.

Heimbeck continues to prefer the Pirquet to the Mantoux test, which in his opinion tends to be too indiscriminately informative. He refers to the possibility of vaccination by the inhalation of B.C.G. in imitation of natural infection with tubercle bacilli; and, being much impressed by the benefits of accidental infection with virulent tubercle bacilli soon after B.C.G. has changed the Pirquet reaction from negative to positive, he looks forward to the time when such accidental infection will be replaced by carefully controlled intentional infection with virulent tubercle bacilli in order that the comparatively short-lived B.C.G. immunity may be replaced or substantiated by a more lasting immunity. His taste for the unorthodox induces a certain breathlessness in some of his colleagues, but the man who twenty years ago was regarded as very dangerous is now honoured as the father of B.C.G. vaccination in Norway.

ASEPTIC DISPENSING

THERE is nothing new in the idea of dispensing by an aseptic technique; for many years systemic injections and some drugs of low stability have been handled in this way. But the advent of penicillin gave fresh impetus to this branch of pharmacy, and nowadays the dispensaries of our larger hospitals regularly supply to the wards sterile solutions not only of penicillin but also of streptomycin, riboflavine, aneurine, ergometrine, water-soluble vitamin K, sex-hormone preparations, and many other drugs. The technique calls for a special laboratory or preparation room similar to that required by the regulations under the Therapeutic Substances Act (T.S.A.). Some of the smaller hospitals are still ill-equipped for this purpose; and the Ministry of Health has lately suggested that in such instances the resources of any nearby pharmacist licensed under the T.S.A. should be employed. The eventual aim must be to supply an aseptic service wherever sufficient demand is manifest. The Pharmaceutical Society, alive to the growing importance of this method, have pressed for the instruction of student pharmacists in bacteriology and aseptic procedures,[1] and today in most of the large towns the schools of pharmacy or technical colleges are holding regular courses in these subjects. In the early days of penicillin the Medical Research Council recommended that the hospital pathologist or bacteriologist should be responsible for its preparation. Now, however, this task is rightly regarded as within the province of the pharmacist. Nevertheless, the pharmacist should not be left to work in isolation. The aim is complete sterility, and the concept of "degrees of sterility" or of "relative sterility" should not be countenanced. The work of retail pharmacists engaged in this field is subject to periodical tests by the T.S.A. inspectors. A few have equipped themselves for actual bacteriological control at all stages; and all deserve any help that local departments of bacteriology can afford.

To some the aseptic dispensary may perhaps seem unduly elaborate, and it may be argued that the doctor's demands for sterile injections could be met from standard preparations. Certainly these are to be had in great diversity, but there remain the unusual dosage or combination, or other individual requirement which cannot be met in this way. Indeed, the increasing need for aseptic dispensing in retail pharmacy is reflected by the growth in the number of T.S.A. licences. Last October the number in England and Wales was 11 now it is 185. The pharmacist in a small way of busin may object to the expense of equipping himself for t work; but comparatively cheap and yet satisfact equipment,[2] and other ingenious devices by which t cost is kept down,[3] have been described.

M.O.H.

THE duties of the medical officer of health are grea altered by the National Health Service Act. Respon bility for local-authority hospitals, which was his, been transferred to the regional board, while the clin services which he administered will be controlled by board or by the local executive council. At first sigh might seem that these changes reduce the interest opportunities of the M.O.H.'s appointment; but at installation, last Thursday, as president of the Soci of Medical Officers of Health, Prof. R. H. Parry stou denied that this is so. "There is little doubt," he "but that in the interest of preventive medicine ma of these changes will be for the better. Much administ tion will be taken from the health department, and consequence the medical officer of health will have m time to devote himself to his professional duties a public-health worker." Henceforth the M.O.H.'s f task is to advise the local health authority on the remo of conditions impairing local well-being. It is not alw easy to combine the functions of administrator advisor, and thus the relief from administrative w should assist him in his advisory duties. Professor Pa proposes that in fulfilling these duties the M.O.H. sho have the help of an advisory committee, whose findi should be made public. The public-health medical off is now at a serious disadvantage in having no opportu to visit the home and the family except as a sanit inspector; and the old idea that he should be "in pendent of private practice" should be discarded. should engage in work as either a private practitione social medicine or as a specialist epidemiologist, in e case with opportunities for research. At the same ti clinicians should be encouraged to interest themsel in public health by gaining direct information abo environmental conditions. The concept of social medici can bring clinician and public-health worker into a team; there will be overlapping, but this is so with good team, for without it a gap is left open. All memb of the team should meet from time to time at case c ferences, in the interests not only of research but the patient. Professor Parry, the declared enemy of t chair-borne, concluded: "Let those that are satisfi sit at the office desk and administer, but for the pioneeri spirit there is still the open road."

OF DYING

Dr. Johnson preferred not to think about death, y when his time came he made a good end. For mo people this is a sound enough policy in dealing wi an event as awkward as it is unpredictable; but docto cannot stand aloof in quite the same fashion. They a obliged to give practical help to the dying, and th must know how best to do it.

In a symposium in the *Practitioner*[4] Lord Hord discusses the signs and symptoms of impending deat Dr. Hugh Barber the act of dying, Dr. W. N. Lea the care of the dying, and Dr. Leslie Banks euthanasia and because dying ends fatally, Prof. Sidney Smit reviews the medical and legal aspects of death, and M G. S. Lear some points about embalming and cremating They read more lively than their subjects would sugge Lord Horder warns against the deceptive patient wh gets better after all—the typhoid patient, who h patterns and sequences, thus clarifying what may be termed their space-time relationship; and from the patterns discerned on examination and the sequences observed over a period of time, the future course of events is predicted. But the original data are considered in the light of further terms—those of physiology, pathology, and ætiology. These are studies by the methods of science; and the gift of insight, the ability to discern and develop analogies, to detect patterns and sequences, and to interpret logically, constitutes artistry that is an integral element in scientific activity at its best.

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[1] *Pharm. J.* 1947, 158, 125.

[2] Jackson, F. J. *Ibid*, p. 431; *Ibid*, 1948, 160, 220.

[3] Williamson, R. B. *Ibid*, 1947, 158, 109.

[4] August, 1948, pp. 73–107.

CONCLUSION

It may be urged, said Dr. Walshe, that this examination of intellectual machinery simply complicates a process normally taken in the stride. Such criticism is more likely to come of intellectual sloth rationalised as practical common sense or from the comforting persuasion that freedom to think implies also freedom not to think, than from any deep conviction that each can do his best without knowing something of how he does it. The capacity to advance knowledge materially and to develop a due critical faculty are both impossible on the plane of practical common sense."

"Further, I ask how medicine can be worthily taught on its academic side unless by minds well versed in the liberal arts . . . understanding the principles on which knowledge is ordered and capable of expounding and of showing in action the reasoning methods involved."

In conclusion Dr. Walshe said:

The need for rebuilding the foundations of medicine was never greater than today when we are being swept along on a spate of new knowledge and new techniques, and have so little time for their due contemplation and integration. Surely there could be no function more truly appertaining to our traditions, or more in harmony with the life of that great natural philosopher whom we commemorate today, than to seek to study and to consolidate these intellectual foundations, and to further what I have called a generality of understanding.

If some philosophy of medicine does not find a home amongst us, where shall this be found? Not, it is increasingly apparent, in the modern university, nor in a Ministry of Health; and if we do not show ourselves eager to promote such a philosophy, then the sum of our corporate activities as a college, whatever their immediate importance, becomes trivialised.

History does not record what book it was that William Harvey was reading, as he sat under a tree with the two young sons of Charles the First at the battle of Edgehill, but we may be sure that it did not deal with consultant services nor with the pay and grading of specialists.

The vigour of such a society as this college can be preserved only for so long as we actively and corporately cherish and foster intellectual ideals. All vigorous societies cherish aims over and above the safe provision of the material necessities and gratifications of their members, and once we allow these to dominate our conscious aims, decadence will have already marked us for its own.

The world in which we live has seen more change since Harvey's day than did the millennium before him. His exhortation "to search and study out the secrets of nature by way of experiment" now has implications he could not have foreseen. Research today within our science is the purpose of large organisations with vast budgets at their command, and its guidance and inspiration have outranged our capacity and slipped from our grasp, for reasons some of which have been beyond our control. Nevertheless, no loyal sons of this ancient college will be willing to allow that we are left without a worthy purpose. This college can, and, if it is to survive as something significant in the intellectual life of medicine, must remain a fountainhead of academic medicine, of true learning—the home wherein a philosophy of medicine finds a permanent abiding place and disciples eager to learn and to teach it, and where the liberal traditions of medicine can look confidently for their defence against the constant threat of debasement by the technical arts and by the spiritually and intellectually oppressive materialist dogmas of our day.

THE TRANSVAAL HOSPITALS DISPUTE

FROM A SOUTH AFRICAN CORRESPONDENT

MANY of the arguments lately heard in Great Britain have been aired again in the Transvaal province of South Africa, where doctors are involved in a dispute with the Administration over the proposed introduction of a free hospital service. So definite and irreconcilable are the opinions of the disputants that honorary staffs in the hospitals of the province have refused to operate the proposed scheme, and consequently the hospital service is disrupted and is deteriorating rapidly.

Hospitals had for many years been financed and organised out of public funds, but had been staffed on the "voluntary" plan with interns and honorary surgeons and consultants. As a new measure of social service a recent ordinance of the Transvaal Provincial Council proposed that all hospital treatment should be completely free, and to this end new salaried posts should be created in the hospitals, which it was hoped that the present honoraries would apply for and accept. The South African Medical Association felt that a completely free service was not desirable, and suggested that a means test should be applied. This suggestion met with no sympathy from the Transvaal Provincial Council, which maintained that the ordinance expressed the will of the people.

Both sides made emphatic public statements. The S.A.M.A. maintained that the new ordinance would bring about increased demand on the hospitals and hence lack of accommodation for the adequate treatment of the sick poor; that it would endanger the livelihood of the profession; and that by allowing free medical treatment to those who could afford to pay it would upset the whole foundation of the honorary system. The Administration replied that a system of hospital care paid for by taxation would remove the dread of financial embarrassment that serious sickness means for the middle-class patient; that there would always be enough remunerative work for doctors even under the new system; and that the authorities were fully prepared to pay for medical services rendered under the ordinance.

The dispute dragged on. On Oct. 1 the new ordinance came into force. The doctors did not apply for the new salaried posts, but proposed attending inpatients in the hospitals for a further fortnight as a period of grace. They also proposed mediation, which the Administration would not accept. On Oct. 2, when negotiations seemed to have broken down, the S.A.M.A. issued a directive that all honoraries should cease acting immediately, provided that, if they were permitted access to the hospitals, they should continue treating patients admitted before Oct. 1, and that emergency cases should be treated if specially requested by the medical superintendent. At the same time the S.A.M.A. reiterated its previous demands, and the Administration repeated that it could not accept these demands.

While this action was designed to safeguard at the same time the patients' interests and the doctors' rights, it inevitably curtailed the hospital services and largely shocked public opinion. In most hospitals emergency arrangements were made with the staff available. Outpatient departments were generally closed and bewildered "regulars" were turned away. Casualty departments functioned, but patients requiring ward treatment were put on a waiting-list. As patients left hospital and very few new ones were admitted, beds and wards rapidly emptied. The Transvaal newspapers published photographs of operating-theatres standing unused, and there was much mention in the press of the Hippocratic oath.

The Transvaal Provincial Council then announced its intention to take a referendum, asking the public to

Special Articles

THE STRUCTURE OF MEDICINE

DR. WALSHE'S HARVEIAN ORATION

The annual Harveian Oration was delivered at the Royal College of Physicians last Monday, St. Luke's day, by Dr. F. M. R. WALSHE, F.R.S., who took as his subject the Structure of Medicine and its Place among the Sciences.

Commonly, he said, the intellectual structure of medicine is expounded in terms of two pairs of antitheses—namely, art and science, observation and experiment. Thus the relative scope and limitations of observation and experiment are treated, not as they should be, in terms of experiment as one mode of observation, but as though the two terms expressed a thorough-going dualism in scientific method. A comparable distortion usually informs the comparative consideration of the rôles of art and science, and many an empty argument has been held on whether medicine is the one or the other. In fact, all these antitheses arise from the unguarded use of abstraction. To achieve a philosophy of medicine it is necessary to escape from the fragmentation of ideas that comes of thinking too exclusively in the *static* terms of classifications; more thought should be given to the idea of process.

MEDICINE AND PHYSIOLOGY

Some physiologists, said Dr. Walshe, would deny medicine its place among the sciences, and speak of it as nothing more than applied physiology. Historically, such a claim is easily refuted, for the hospital is the cultural ancestor of the laboratory, and experimental physiology was born of therapy. Implicit in the physiologist's argument is the thought that medicine does not carry its analysis of phenomena back to fundamental notions, but stops at a half-way house where it meets and tends increasingly to borrow from other sciences. Yet here medicine is no exception amongst the biological sciences; and indeed physiology has been eagerly borrowing from the other sciences for the past hundred years. The truth is surely that every successive layer of thought in the analysis of nature, living and dead, stops at a half-way house when tracing its ideas back to their basic elements, and is content with ideas of a generality sufficient for its immediate purpose. For philosophy alone, which aims at supreme generality, there is no half-way house.

Some generality of understanding is the essence of a civilised culture; the medical professions must seek it if they are not to decline to the level of craftsmen and technicians. This danger is real; and the many proposals for reform of medical education designed to avert it have been superficial and uncoördinated.

OBSERVATION AND EXPERIMENT

In observation, Dr. Walshe continued, what is retained is retained in a subjective order of importance, and thus there is some distortion of the impartial facts. The term "trained observer" acknowledges that observation is discrimination and not a product of pure sense perception. All observations are subject to interpretation in terms of concepts; the notion of pure knowledge as the product of pure sense perception corresponds to nothing in human experience. There is a constant interplay between the conceptual and the observational order of experience. New observations modify concepts; but, not less, new concepts lead to fresh possibilities of observation. The mind that observes is also the same that devises, performs, and interprets experimental observations; for experiment is but a method of providing observable data. Thus no higher order of rationality attaches to experimental observation.

In medicine, the data, often very incomplete, a taken in all states of refinement. They have to be sort translated into the language of medicine, expanded analogy, logically interpreted, and finally made to emer as clearly formulated propositions, and as exemplifi tions of laws of nature. It is because important data so often lacking that recourse is commonly had to method of experiment. The ultimate aim of the scient observer is to grasp the principles inherent in the stre of evanescent phenomena; and by experiment he se to isolate his material to make it reveal its principl In the words of A. N. Whitehead, "experiment is a w of cooking the facts for the sake of exemplifying law." Experiment thus provides a double clarificatio the formulation of an abstract principle, and the exe plification of it in as simple and unequivocal a medi as possible. Clearly an even higher degree of abstracti is involved here than in simple observation. This perhaps why the experimental method, exclusiv pursued, may prove narrowing to the mind; it may a account in a measure for the ill-disguised hostility many experimental scientists to metaphysics. "Act is easier than contemplation." Nevertheless, fundamental distinction separates observation experiment. In both there is a concentration attention upon specific phenomena, and also so control of events; and both seek to provide data interpretation.

In medicine there is too great a readiness to equ the notion embodied in the word "experiment" w that of "animal experiment," and to think of exp ment as something divorced from the bedside. Sim experiments are prevalent in day-to-day clin studies.

> "Every time we evoke an extensor plantar response every time we elicit a knee-jerk, we are forcing cert spinal mechanisms by their mode of reaction to re internal conditions in the central nervous system unaided observation by the five senses cannot tell us. We are controlling conditions and isolating our mate by a method that has all the essential form of the expe mental method. . . . The hospital ward is a laborato in the fullest sense, is indeed the parent of all biologi laboratories."

ART AND SCIENCE IN MEDICINE

In discussion of art and science in medicine some le too readily to hard antithesis, for the continual tenden is for the practical arts to be converted into appli science. In theory this is understandable, for the practic arts are operations according to rule, and rules are gene propositions referring to particular cases and direct *to future situations.* Thus the rules of a practical art predictions to be tested and validated by prescrib procedures. In this may be seen the slow developme of science in medicine—the emergence of ideas fro activities, and the influence of these ideas in rationalisi and modifying the activities from which they emerg As to the term "applied science," it is well to rememb that this cannot be applied in medicine to the fruits scientific discovery irrationally employed.

Turning to the intellectual arts, Dr. Walshe said th here the problem becomes not that of art *and* scien but that of art *in* science. The physician seeking to b scientific attempts to transform the confused data direct experience into the clearly formulated proposition of a *rational* science, and to identify the patient' situation as a particular example of the *relevant* natura laws or general principles. The accomplishment of th is essentially a special example of the use of the libera arts. "For the trained mind every complex of presentin phenomena is a text to be read, translated into th grammar of science, rhetorically expanded, and logically interpreted." Signs and symptoms are grouped int

Disabilities

15. DEAFNESS

The general public does not understand deafness. Partly I surmise because it attracts little attention and does not evoke sympathy to the extent that blindness does. The reaction of most people when told that I am deaf is to shout in my ear; and on being told that this is useless, that I lip-read with great difficulty or not at all, and would they please write their question down on paper, they walk off. Nor is it appreciated that hardly two cases of deafness are alike. Each has its peculiarities. There is every grade of deafness from very slight to complete, and these grades are further differentiated by whether the deafness be from birth, early childhood, later childhood, adolescence, maturity, or old age. On top of this is the mental capacity of the deaf person and his attitude to life; this last is more important than anything in determining whether deafness is to be an insuperable obstacle or not.

I became totally deaf in 1915 as the result of cerebrospinal meningitis, when I was 13. I believe I had exceptionally sensitive hearing before that, for I could pick out with ease the various voices singing in harmony, and too close a proximity to fireworks would temporarily deafen me. For two days I was delirious, and my first impression on waking was that the large building opposite my bedroom had been transformed into a war factory, for I could hear machines buzzing, hammers forging metal on metal, and steam escaping from valves. I was speedily undeceived by my mother writing to me on a slate, for she had already discovered that I was deaf.

The noises I heard were, of course, tinnitus, and they have persisted ever since; so it is erroneous in my case to describe myself as living in absolute silence. On the contrary, a bigger medley of sounds than I can describe accompany me willy nilly, though I have long since learnt to ignore them when my mind is otherwise occupied. Submitting to the fact of total deafness, as I must, I am rather glad than sorry that I have these head-noises, for I find it pleasurable at times, and even profitable in a sense, to bend them into a tune remembered from my hearing days or composed impromptu. The various sounds accurately fit instrumental music. In this purely subjective manner I can "hear" music at times; perhaps Beethoven, who was for years stone deaf, composed in this way!

Almost complete loss of balance accompanied the onset of my deafness. It took me fully six months to learn to walk reasonably straight in daylight; and only by walking swiftly could I keep a fairly straight course in the dark, and then only by having something visible—a lamp or a lighted window—to steer by. A turn of the head to speak to a companion would upset my balance and make me wobble about like a drunken man. Even now, I cannot walk straight in complete darkness.

A further peculiarity was (and is) that whereas before my deafness my field of sight remained at a constant level, it now went up and down with the movements of my head. At first this was a nuisance, but it has become somewhat modified with the passing of the years, though it is still noticeable when the head is involuntarily jerked as in vehicles passing over bumpy roads.

These were the subjective results of total deafness in my case; but they were not the most important effects. It was at once forced on me that deafness means isolation from the normal world. It was uncanny after about three months in and out of various hospitals and convalescent homes to revisit the scenes of my recent hearing life, to meet my former class-mates, to watch the heavy streams of traffic in the West End, and yet to hear absolutely nothing. Vibration could be, and still is, felt; but only from heavy vehicles, or from footsteps on wooden floors.

Being cut off from one's fellows by an invisible and ever-present barrier is the heaviest blow and disability of deafness. My friends knew nothing about it; only personal contact with me could have taught them, and that personal contact I dreaded. There was a constant tendency to withdraw as far as possible from intercourse with the outside world, and obviously if this had been allowed to go on unchecked mental instability would have resulted. Even so, my speech began to suffer through lack of use. I became more and more tongue-tied, and when I did speak I gabbled. Normal folk had difficulty in understanding what I said.

I can hear my own voice perfectly—even a whisper sounds loud—but I know that to hearers my voice has the characteristic deaf tone. I can also sense a difference in my voice according to the size of the building in which I am speaking; but whether this is based on reminiscence or not I cannot say.

* * *

Such then were the general conditions with which I, at the age of 13, had to face life. At first I was somewhat buoyed up by the repeated statement that in time my hearing would return. It did not, and I am now aware that deafness resulting from meningitis is virtually for life. Six months later I went to a deaf school, and at about the same time I entered what is known as the "deaf world" by joining in the activities of the Royal Association in Aid of the Deaf and Dumb—otherwise I might well be mentally ill today.

Though I had become totally deaf so young, I had one great advantage over the born-deaf and those who become deaf even earlier than myself—I could read with profit. On that apparently simple fact, coupled with my entry into the "deaf world" everything hinged. It was a cardinal point. At the deaf school I simply could not lip-read. The ability to lip-read is a gift. You are either born with it or you are not. Out of the hundreds on hundreds of deaf people whom I have met, very few can be called genuine lip-readers, and I know no lip-reader at all who can follow a normal speaker at a lecture. Those without the gift can try for years and never get beyond mastering the ordinary phrases "How are you," &c. But I could read.

It was clear that I should have to educate myself solely from the printed word. There is a saying: "The eye for the ear, and the hand for the tongue"; and it illustrates the truth that for the deaf all knowledge must go in through the eye, and much of it must be spoken on the hands by using the manual alphabet or by signs. My communication with the non-deaf world is almost entirely by means of pencil and paper. If my school-teachers wished to tell me anything they had to do it in writing, for some refused to spell on their hands. If my employer wished to give instructions he too had to put it on paper; I found this rather an advantage, for if any mistakes were made I could verify what I had been told to do. I cannot say that I found total deafness a disadvantage as a silversmith. On the contrary, the fact that I could work at a delicate job amidst terrific dins was a great help, and I took full advantage of it.

Meanwhile for a decade I had been living in the deaf world. Nearly all my former hearing friends had long since dropped out of my life; but in their place I had made contacts with deaf ones, and was taking part in a normal social life with them. In this way my own deafness became, as it were, normal.

I suppose I am one of the few totally deaf men to have been through a college. I was allowed by the authorities at King's College, London, to take their theological diploma. The same could be done by any deaf person provided they can read with profit. I attended lectures, decide whether a means test should be applied to the hospital scheme or not. There seems to be some doubt as to the legality of this step—which is unprecedented in the Union—and the council have since deferred action, while again discussing the possibility of the appointment of a mediator acceptable to both parties. Whether either side is now prepared to accept—by referendum or mediation—a solution contrary to its own proposition is somewhat doubtful.

Johannesburg interns have stated that they cannot carry on with work outside the range of their experience without the guidance of the honorary staff. In this statement they have since been supported by the interns of other hospitals in the Province. So the dispute goes on with statement, ultimatum, and counter-statement.

POLIOMYELITIS IN NEW ZEALAND

FROM A NEW ZEALAND CORRESPONDENT

In New Zealand the conduct of operations against serious epidemics is on national lines instead of being left in the hands of the medical officer of health according to the needs of the district. And mass restrictions have always been more popular in the Antipodes than in Britain. So when poliomyelitis descended suddenly on Auckland last November, producing 26 cases within a fortnight, a ban was placed on all gatherings of children under sixteen throughout the Dominion, and on their travel between the two islands. The interference with education, and the dislocation of normal community life at Christmas, were serious, and by March it was obvious that the bans were no longer serving any useful purpose even if they had originally done so. Accordingly the official policy was changed in favour of closure of the particular school affected. By this time the epidemic was running at some 13 cases a week, and it has since continued throughout the winter, with seldom less than 20 cases a week and with the Auckland province still providing the highest incidence.

The Wellington health district has never been immune, but there were not very many cases till recently when the disease showed evidence of rapid spread, attaining 72 notifications in September. The reopening of the schools was therefore postponed. But the Royal Australasian College of Physicians, meeting in Dunedin, passed a resolution for the consideration of the minister of health that "there is convincing evidence from epidemics elsewhere that the general closure of schools has had no influence on the spread of the disease or its severity," and "at this stage of the epidemic no useful purpose can be served by the general closure of schools," adducing as evidence of this the very high rate of abortive cases among both adults and children. The minister accordingly announced a new approach to the problem. Children were to wash their hands before eating, parents were to provide them with towels, and teachers were to see that excessive fatigue was avoided, to wage war on flies, and to conduct a morning health inspection, reporting any suspicious symptoms to the district health office.

Now the newspapers have just described a report by Dr. A. W. S. Thompson, medical officer of health at Auckland, tabled in the House of Representatives as an appendix to the annual report of the department of health. He and his colleagues investigated fifteen areas, each of about twenty houses, where the first cases of poliomyelitis occurred, and noted the incidence of minor illnesses consistent with a diagnosis of abortive poliomyelitis. (For purposes of comparison a similar inquiry was made in areas on the other side of the harbour where no cases had been notified.) The ratio of suspect illnesses to positive cases proved to be about 300 to 1, and on this basis the true number of cases in t Auckland outbreak has been about 40,000 in ni months.

REFRESHER COURSES FOR GENERAL PRACTITIONERS

MINISTRY'S ARRANGEMENTS

The Ministry of Health has set out in a memorand (G.P.R.C.1) the Government's scheme for grants und the National Health Service Act to practitioners in t National Health Service who attend refresher cours The memorandum also defines the conditions on whi doctors engaged in general practice before recruitme to the Forces may apply for a similar grant aft demobilisation.

Practitioners in the Health Service.—The courses f attendance at which financial assistance is offered a those specially arranged for general practitioners by t universities and medical schools. A practitioner taki part in the N.H.S. can claim grant for attending o course of 22 half-day sessions or two of 11 half-d sessions (which may be either intensive or spread o a number of weeks), provided that:

1. He has been qualified for at least three years.

2. He has not less than 500 (or in a rural practice 2 people on his list. In the early days of the service, howev a minimum of 300 (or 150 in a rural area) may qualify.

3. Within the previous year he has not received financ assistance under the Government schemes for doctors releas from the Forces, or for N.H.I. or N.H.S. doctors. Exceptiona this condition may be waived.

Application for admission to a course and for gra should be made on form G.P.R.C.2 to the universit which, if prepared to accept the applicant, will forwa the application for grant to the Ministry. The Minist will then inform the doctor, the executive council, an the university whether the application is approved. doctor qualifying for grant is normally not concerne with payment of the course fees. The following expense may be reclaimed by those qualifying: (1) subsistenc allowance up to £1 a day, if attendance necessarily entail absence from home at night, or otherwise actual expense up to 5*s.* a day; (2) travelling expenses; and (3) pay ment of a locum tenens where necessary, up to a maximu of 14 guineas a week.

Details are given in the form of claim (G.P.R.C.3 which should be completed at the end of the course an sent to the postgraduate dean or director who, afte certifying that the course had been attended, will forwar it to the Ministry for settlement. Copies of applicatio and claim forms are obtainable from postgradua deans or directors.

Ex-Service Practitioners.—Broadly the arrangement for practitioners released from the Forces are the sam as those for doctors in the N.H.S. Ex-Service doctors are, however, given the option of returning to thei medical school, where they may select the instructio they most need; and in this event they can claim reimbursement of fees up to a maximum of 10 guineas for 22 sessions. The conditions on which grant is made to the ex-Service practitioner are that:

1. He applies within a year of demobilisation.

2. He has not within the previous year received financial assistance under the Government schemes for doctors released from the Forces, or for N.H.I. or N.H.S. doctors. Exceptionally this condition may be waived.

Any ex-Service practitioner satisfying these conditions, and accepted by the university, automatically qualifies for grant; the Ministry's prior approval i not required.

At Hamilton Station. eight miles away on the other of the town, there is now another laboratory. of mice, here is a profusion of rabbits and dogs. a few cats whose coat-colour inheritance is being The rabbits are being selected for anatomical and malformations. such as extra ribs and and patent foramen ovale; it seems that human abnormalities have their counterpart in these The dogs are of several pure breeds. and the work concerns behavioural matters—whether. for a litter of pups from a normally staid breed more playful if brought up by a mother of stock. The visiting investigator is overwhelmed the two chief features of the laboratory: the valuable material, enough to keep a score embryologists, histologists, and pathologists busy for ; and the hospitality and group feeling of the which would induce the visitor to sign on every as a summer investigator if only he could.

* * *

He was a silvery-haired fresh-faced English surgeon, always travelled abroad in a plum-red corduroy and green bow tie—the picture of glorious Techni-. His knee-length R.A.F. boots completed the . As spring broke through he reached Brati-. “Tonight ve shall dine in se Café International,” ed his host. As they entered the café—a lovely anean mid-European “wein-stube.” complete alluring alcoves—the orchestra instantly struck up merry tunes which showed no signs of ever to an end. “What is that infernal music, ?” asked the surgeon. “Russian folk music, believe,” was the reply. “Can't you get the band to something soothing—Strauss or Lehar?” suggested tired traveller, and his host approached the orchestra. “ your friend, he is not Russian?” inquired the Kapellmeister. “No,” came the firm reply, “ is English.” “Then ve must play, *It's a long long* *Tipperary*.”—It certainly was.

* * *

A surgeon must face many risks. But there is one in which no insurance policy covers. Here is what ed. An African was brought to hospital with an abdomen. He was operated on. There was a ated appendix and generalised peritonitis. He died. latives and friends then went on strike. They said: The doctor is a great magician. He can, if he wishes, our brother live again. But perhaps his magic is strong enough. Then he must marry the widows of dead brother. We shall agree to his taking over the , among whom are some girls, who will bring many oxen one day when they are marriageable.” was pointed out to them that the offer of the children with the widows was appreciated, but wasn't their unfair to the brothers and nephews of the deceased, by native law, inherit the widows and children? shook them a bit. In the end a payment of £25 the matter.

* * *

Colin's mother is perturbed over his asthma. since he it in such unauthorised fashion. His school friend of a sporting family who keep racing greyhounds. evening at play, when they were seven years old. friend brought out to share with Colin two boxes of dogs' special racing tablets. (“The label says: *To soldiers, sailors, and airmen when all hope is* ned, doctor.”) Highly strung as he was by nature, by the end of his second tablet was keyed up to the roof off. His family spent a restless and night with scant benefit of bromide. “And ever the tablets he's had this asthma come on him.”

* * *

Cross my heart, this is an exact copy of a letter received a clinic nurse in my district.

Miss the Nusse

You sent Harry home becos he smeld. He just smeld as father did an Ive slep with him 20 yrs an he soots me very so you will have to make him soot you.

Mrs. . . .

Letters to the Editor

M.R.C.P. EXAMINATION

SIR,—“Another M.R.C.P.” remarked very truly on Sept. 18 that what is wrong with the membership examination just now is “not the system but the excessive number of candidates.” He makes three good practical suggestions for deterring “sportsmen from putting a bit on the membership as if it were a horse”; but, like other correspondents. he does not inquire into the reason for this recent embarrassing increase in the number of young medical sportsmen. No doubt there is more than one cause or motive, but I am quite sure the increase derives mainly not from an outburst of sportsmanship, a sudden lust for learning, or desire for a crown of wild olive. but from the flight from general practice, easily predictable at the time of the white-paper and now plainly visible to all not wilfully blind.

The young man sees, looming close ahead, a statutory definition of consultants and specialists which, for physicians. will include the membership. He sees the existing ditch which splits the practising profession being industriously deepened and widened, its banks heightened and concreted. the bridges over it destroyed and no new ones built or even planned. Beyond it he discerns the Accredited Consultants. to whom shall belong whatever of honour, glory, power, and dominion the profession may enjoy, substantial salaries, at least some freedom to define their own fields of activity, that protection from exploitation which belongs to institutional practice, and at least some proportion between reward—financial or other—and quality of work. On his side he sees “the rest,” general practitioners rather by inference than definition, the Universal Providers, the indispensable but unhonoured middlemen, the unlockers (on request) of the medical toy and sweet cupboards, defenceless against exploitation from below or regulation from above, shut out from the hospitals and unsupplied with ancillary services, remunerated quite without regard to quality of work, qualifications or proved ability. This is the “set-up” for the future the young man sees. accepted by Parliament. disliked but not rejected by his profession, seemingly intended to be permanent. I suggest that unless widening operations on the dividing ditch are called off. bridges constructed without delay, and conditions of professional life and rewards for good work on the near side brought up to those on the far, the pressure of unlikely candidates on the membership and fellowship examinations will be the least of the evils we may expect to fall on medicine. on our profession, and, of course. on the public. who still do not understand that what is bad for medicine and the profession must be bad for them.

London, N.W.3. LINDSEY W. BATTEN.

INFANTILE GASTRO-ENTERITIS TREATED WITH STREPTOMYCIN BY MOUTH

SIR,—It is encouraging that Dr. James and her colleagues (Oct. 9, p. 555) have found streptomycin to be an effective drug in the treatment of infantile gastro-enteritis, but it is profoundly disappointing that they have not reported an effectively controlled experiment on a large number of cases. Gastro-enteritis. of all conditions, is one in which the severity and the mortality varies in different individuals, different countries, towns, and hospitals, and in the same hospital in different years, so that in one epidemic no deaths may ensue while in another a third or more of the affected babies may die.

This paper reports the results with streptomycin in three groups of cases. In group A, 4 newborn infants received the drug and are compared with 23 cases treated by “routine measures.” There were no deaths and it is claimed that following streptomycin the 4 treated cases, though “the most severe in the outbreak,” recovered more rapidly than the 23 untreated. In group B—12 infants in a residential nursery—4 cases, including 3 which were “much more severely ill than any of the controls,” received streptomycin some days after diarrhoea had commenced, while 8 had no streptomycin. Again there were no deaths and again it is claimed that response to streptomycin was rapid. The way in which the authors not to listen, for I couldn't, but to copy notes from friends as I sat beside them. In that way, and by borrowing other notes, I probably obtained a better record of a lecture than the normal student. The notes, coupled with the careful study of recommended books, enabled me to hold my own. After all, this is much the same as taking an external degree. For many years now I have been employed as a chaplain and worker for the deaf, and have met thousands of all types. Our classification is generally this: the born deaf, or the deaf and dumb; the deafened, those who suffer from more or less severe acquired deafness; and the hard-of-hearing, who with an aid can retain their place in the normal hearing world.

For the first two classes the greatest disability caused by deafness is the isolation and cutting-off that I have described. The disability of having been born deaf, though it has the inevitable consequence of retarding education to a degree quite unrealised by the public, is less of an affliction than acquired deafness, for the born deaf never know what they miss.

Where deafness is incurable, either from birth or afterwards, the only way to a normal life where the disabilities of deafness can be forgotten is to take an active part in the social life offered by the welfare agencies. In spite of the many things that a deaf person can do as well as the normal, deafness remains a formidable handicap. The Disabled Persons Act and the new National Assistance Act may do much for the likes of me. A regular job, freedom from anxiety, and an interesting social life are needed if the results of deafness are to be side-tracked.

Public Health

Mobile Maternity Centres

THE Ministry of Health, in a circular (161/48) to local health authorities, suggests the use of specially equipped vehicles for the examination of mothers and young children in remote areas. These mobile centres could be used as adjuncts to waiting-rooms hired periodically, or for conveying the equipment needed to convert rooms temporarily into a maternity and child-welfare centre. The Minister also urges the formation of further mobile dental clinics.

Poliomyelitis in the U.S.A.

The poliomyelitis epidemic in the U.S.A. is now believed to be past its peak. In the week ended Sept. 25 the number of cases reported was 1609, compared with 1840 in the previous week. The five-year average for the corresponding week is 881; and in 1946, the last big epidemic year, there were only 1425 cases. The decline, says *B.U.P.*, has come later this year than in 1946, and the cumulative total of cases for the year up to Sept. 25 is higher—17,653, compared with 17,206 in that year. Between March 20 and July 24, 59% of all cases were recorded in North Carolina, Texas, and California; the present fall is sharpest in the north central States.

The Second Quarter

The following vital statistics have been reported for the second quarter of this year:

—	Births		Deaths		Infant mortality per 1000 births
	No.	Annual rate per 1000	No.	Annual rate per 1000	
England and Wales	203,711	19·0	110,356	10·3	31
Scotland	26,554	20·7	14,695	11·4	43
Northern Ireland ..	8030	23·9	3821	11·4	44
Eire	18,006	23·8	9419	12·5	46

In England Now

A Running Commentary by Peripatetic Correspondent

IN the course of several years of psychiatric practi I have regarded the term "trick-cyclist" at first wi suspicion, later with tolerance, and finally with affectio It is a kinder appellative than many that come our way it at least suggests that one is capable of performanc requiring unusual balance and poise. It came, howeve as something of a trauma to be confronted with t real article, a being who literally trick-cycles for h bread and butter. Referred by his M.O. as a case anxiety state, Sydney was a tremulous sweaty weed a youth who laid claims to "blackouts" for as long as could remember, if not longer. He had always been t shy to play with other boys, and his dad had boug him a motor bike "to bring him out of himself." T desired social effect was apparently not forthcomin and dad, perhaps in despair, had gone off with The Oth Woman. Having now a mum as well as a motor bi to care for, young Sydney very creditably sought mo gainful employment. Came the local fair and our he found himself gazing at the "Wall of Death" with a w surmise. Modestly he offered to reinforce the small staff two, the Boss and the Lady. Surprisingly he was accepte

At that time he was averaging three blackouts a da but for several weeks he contrived to have them lavatories, peep-shows, pubs, and secluded gutters, a to keep his art pure and uncomplicated. It took him b five minutes to learn that his trade really amounted no more than a steady 20 m.p.h. jog, the impression spectacular speed being contributed by the small circu ference of the wall, and the incredible horizontality the whole affair resting entirely with that mysterio but ubiquitous agency, centrifugal force. He was pe mitted to graduate to steering with his feet on t handlebars; but the Lady's tour-de-force of standing the saddle was strictly copyright.

Inevitably, however, he was discovered blacked-out a prostrate, and was summarily dispensed with as bei liable to make the wall altogether too deathlike. Sub quently conscripted, he was classified as unsuitable f dispatch-riding, much to his dismay. As a mess order he was obliged to remain vertical for as much as hour at a time. Accordingly he showed an increasin tendency to regress to a horizontal, though unconsciou similitude of his earlier state.

I wonder if they call trick-cyclists "psychiatris nowadays?

* * *

A visit to the Jackson Laboratory for the Study Animal Behaviour, Genetics, and Cancer, at Bar Harbou Maine, confirms one's belief in the phœnix. Last ye some careless workmen left an incinerator fire before was properly extinguished, and it spread into the pe soil, eventually defying for ten days the efforts thousands of people and a score of fire brigades. Th main building was in the centre of the conflagration an was burned out, and nearly all the mice inside wer burnt or suffocated by smoke. The visitor now see an untidy sort of compound, or barrack square, with few poles and triangles embedded in it, surrounded b the charred stumps of felled trees. At one corner stand the one remaining wing, which was fireproof, cover with wooden scaffolding (this is pine-tree country) with a new roof being finished, and adjoining it a nev wing, now almost complete. At the other side of th square there are three large wooden bungalows which house the summer school. For this there is an enrol ment of some thirty students, who range from college freshmen to candidates for master's degrees. In addition, a dozen or so summer investigators of PH.D. status come up for a few months to work with the incomparable material of the Jackson Laboratory or to escape the heat of the cities farther south and write in peace and quiet. The stakes and triangles are the real skeleton of the phœnix. The new building, when it is completed next year, will have an auditorium, a library, offices, a histology and a biochemistry laboratory, and an electron-microscope room. The old section will only house the mice, which are already back in their thousands. Nearly all the known genes have been reassembled from all over the world.

scale processes used in the production of pharmaceuticals which have made it impossible for the pharmacist to dispense, extemporaneously, all the preparations which modern research has placed at the doctor's disposal. This, of course, applies to the ethical proprietary. With the domestic proprietary the work of the Chemists' Federation has made it possible to envisage the integration of all the pharmacist's activities, since his professional interest in, and understanding of all C.F. proprietary preparations has been justified.

Suggested Principles in Evolving Controls.—Since voluntary control is far healthier and far less expensive, both in money and personnel, than statutory controls, the latter should be kept to a minimum. To encourage success and enterprise the State should be prepared to offer appropriate rewards. Is not the inclusion of the list of substituted proprietary preparations in the *N.W.F.* directly opposed to such a principle? The medical practitioner should be free to prescribe what he believes to be medically necessary for his patient, so that the initial responsibility for deciding what drugs are necessary is placed where it rightly belongs—in the doctor's hands. This principle has been subscribed to by the Minister, though it remains to be seen how far it [illegible] be applied to proprietary medicines.

The medical profession has been well, and often brilliantly, served by the pharmaceutical industry—a contribution to the health and prosperity of the nation which a narrow or shortsighted policy can destroy.

London, N.W.10. E. W. GODDING.

MEDICAL SECRETARIES

SIR,—May a woman have the last word on this subject? As a medical secretary myself, I should like to uphold the claim for special training of medical clerical workers. If I had wanted to take up nursing, physiotherapy, social service, or any other work connected with a hospital, I should certainly not have been accepted without suitable preliminary training; yet I came to my job from one of the Services (and before that a commercial office) with the haziest knowledge of medical terms and hospital procedure. For the first week or so I was in despair, and probably the medical staff weren't too happy either. Having, fortunately, a good memory for words, I worried through and now wouldn't change my job for anything. But every day makes me realise what a lot of technical words I *don't* know. I should welcome a training course which would give me something of the general groundwork of a nurse's training.

Medical secretaries believe that their status would be raised if inducements were offered to young girls to make this a career. With my seniors, housemen, and consultants to type for, and my clinics, waiting-lists, card indexes, two telephones, and other time-occupiers, I don't feel I work any less hard than my colleagues in the technical sections: and I should like to feel that we will eventually reach their rate of pay and length of holidays. Bearing in mind the number of hospitals and doctors needing clerical help, is it too much to ask for specialised training for youngsters who would "love to work for a doctor," but get panicky *if asked to spell* "appendicitis"?

DOCTORS' SECRETARY.

ANOMALY OF ABDOMINAL MUSCULATURE

SIR,—An unusual anatomical anomaly was found in a man who lately came to me for removal of a vesical pouch. The patient was aged 69. The abdominal wall was apparently healthy, and the bladder, which had a pouch the size of a billiards ball, was approached by a transverse [illegible] through the aponeurosis overlying the rectus. Instead of the vertical disposition of the muscle beneath the sheath, I found subjacent fleshy fibres passing horizontally to the linea alba. Although momentarily stunned by this, to me, unique anomaly, I quickly realised that, instead of becoming aponeurotic at the linea semilunaris, the flesh of the internal oblique had continued over the face of the rectus abdominis. The right rectus appeared average, but the left some 40% below average.

This variant had apparently not impaired the efficiency of the parietes. The wound healed normally.

[illegible] A. WILFRID ADAMS.

UNDER TENSION

SIR.—*Among all the sorts* that read THE LANCET there will be those who disapproved of your leader of Oct. 9, and those who approved of it. I should regret that only the former should be represented in your correspondence columns. To others of us your sober reflections round the theme that "it takes all sorts to make a world" contain something more than a half-truth when we are faced with Dr. Chapman's alternative—to look at one half of the world as one who "repeatedly attempts to destroy him and who proclaims, fortissimo, his intention of going on trying. . . ." We seem to glimmer Dr. Chapman's logical counter to that one.

We are clearly enough in a dangerous situation. Dr. Chapman has heard voices and he isn't the only one. Are those voices real? Are they by any chance also heard in Russia? There is always something of fact for international paranoia to batten on. But how little relative to the issues of sane settlement! And, taking the long view (say 40 years in this case), how fundamentally equal are the intolerances and the provocations of the opposing sides! Are threats to vital interests (implied or felt) ever limited to one side in a major international dispute?

It may one day become clearer that the threat which 1948 offered to our world was not primarily that the policy of any power-group aimed at the destruction of the vital interests of any other power-group, but that everywhere people *came to think this so.* Some individuals and some peoples may have more of suspicion to unlearn than others; some undoubtedly have more to unlearn of cruelty to their foes. But shall that thwart our peaceful solution? Such complaints are perennial. Grotius, a Dutchman, tried to set up international law in 1625 but decided that one couldn't cope with the Portuguese.

What we lack is scientific machinery for settling international disputes despite the froth of irresponsible journalism and the honest prejudice of so many men and women. What more appropriate, then, to THE LANCET's last than that it should chase the mental health of peoples a little further than did our recent international congress by reminding us where we stand today? To secure world order, international legal machinery has to be made just as calm, dispassionate, and secure as our own domestic courts of law—simply because it takes all sorts to make a world and (may I add?), because to err is human.

Edinburgh. RANYARD WEST.

HOW MANY NURSES?

SIR,—Dr. Cohen takes as the criterion of nursing and medical effectiveness in hospital the patient's duration of stay "which is assumed to be an index of his duration of sickness." *Is* this assumed by anyone who stops to examine and consider the factors governing admissions to and discharges from hospital?

It is possible that duration of sickness might be accepted as one criterion (among several) of effective care, but it is surely very dangerous to single out that chapter in any individual's ill health which he is allowed or persuaded to spend in hospital, and which may occur at an early or a late stage of his illness, as the index of the duration of sickness. One hopes that at present the hospitals, hard-pressed though they are by waiting-lists, take into consideration the home circumstances of the patients before deciding at what stage of invalidism or of recovery they may safely be allowed to leave. I know that this is an important factor to the good ward sister, whether surgical, medical, or obstetric. To take the simplest instance, has the anxious primipara sent out on the 8th day to a comfortless home (where she immediately "loses her milk" and learns by failure) really received more effective care than the one who goes out on the 14th day or later with a little additional confidence, stability, and knowledge of her new responsibilities? The same applies in the fields of surgery and of medicine. It may be expedient sometimes to shorten duration of stay in the interests of the total sick population, but we need not pretend that it means better nursing or medical care for the individual.

One hates to think that a hospital might be led by Dr. Cohen's hypothesis to make quick turnover of have assessed response to treatment is difficult to follow since it is not clear precisely how weight increases have been reckoned. Moreover, as is admitted in the statistical analysis, the two groups A and B are not strictly speaking controlled experiments. Is it possible to subject the results on so few cases in a disease so variable in its course and outcome to such a detailed statistical analysis?

Finally, in group C, 30 cases were given streptomycin without controls of any kind and it is claimed that they recovered surprisingly rapidly. For instance, "the speed of their response to streptomycin therapy was spectacular" in 3 cases, 2 cases "responded well to streptomycin," and more generally "It is probable that, if cases were treated with streptomycin at the onset of gastro-enteritis, starvation could be safely omitted and generous feeds given throughout the illness." This may all be true, and if it is then streptomycin will save more lives and in much smaller doses than it will ever do for tuberculous meningitis. But surely we can expect to be given more substantial evidence of the beneficial results of a new drug in the treatment of a common and dangerous disease before being encouraged in such a sweeping way to apply it indiscriminately. For that, we submit, will be the result of this paper.

Our own results, based on some fifteen months' experience of streptomycin in gastro-enteritis in the East End of London, now being collected for publication, not only confirm the findings of Dr. James and Mr. Kramer that the gut is rapidly cleared of such organisms as *Proteus vulgaris* and *P. morganii* but also indicate that these organisms rapidly reappear within a few days of withholding the drug. They suggest, moreover, that their presence, their coming and going, or their absence have little bearing on the ætiology of the disease. But we have not, unfortunately, been able to demonstrate by controlled alternately treated cases that streptomycin materially affects the course or prognosis of the disease.

This letter is written in the hope that before streptomycin is made free for general use in gastro-enteritis more convincing evidence of its efficacy will be forthcoming.

IAN M. ANDERSON
RICHARD H. DOBBS
B. LEVIN
B. MCNICHOLL.

Gastro-enteritis Unit,
Queen Elizabeth Hospital
for Children, London.

TRANSVERSE MYELITIS COMPLICATING PNEUMONIA

SIR,—Dr. Suchett-Kaye's report in your issue of Sept. 11 recalls a very similar case in this unit.

The patient, a young man of 18 in the Royal Air Force, was admitted to hospital on Nov. 7, 1947, complaining of pain in the right side of the chest. On admission his temperature was 103°F; there was a patchy erythematous rash over the face and chest, and some exudate over one tonsil. Administration of 'Sulphamezathine' was begun, and the next day he developed a cough with sputum, and increased pain in the chest aggravated by deep breathing. At this time signs of a right pleural effusion appeared, and turbid yellow fluid containing large numbers of lymphocytes was aspirated. X-ray examination of the chest revealed patchy consolidation of the right lower and middle lobes.

On the 6th day of his illness he complained of pins and needles in his legs, and by the 8th day he had a complete flaccid paraplegia with loss of all sensations below the level of the 10th dorsal segment. Lumbar puncture carried out at that time revealed a block in the spinal pathways, as evidenced by yellow fluid with a protein content of 500 mg. per 100 ml. and no response in the manometric reading following jugular compression.

He was transferred to this unit and lumbar puncture 2 days later revealed free pathways and a clear fluid. On admission he was put on heavy doses of penicillin. His right pleural cavity was aspirated on two further occasions. On the first of these a little thick pus was obtained from which a pure culture of *Staphylococcus aureus* was grown. On the second occasion there was a little turbid fluid only, which was sterile on culture.

The patient's chest condition resolved, but the paraplegia remained complete and he developed large septic pressure-sores and a urinary infection which brought about his death on April 10 this year. Autopsy reveal typical transverse myelitis of the cord with organi adhesions in the right chest over the lower lobe.

ARNOLD S. ALDIS
Senior Assistant in the Surgical Unit,
Welsh National School of Medicine

Royal Infirmary,
Cardiff.

PROPRIETARY MEDICINES UNDER THE NATIONAL HEALTH SERVICE ACT

SIR,—My article of Sept. 18 (p. 465) was essential concerned with the professional use, under the A of "ethical" proprietary preparations, but as I Forster's letter of Oct. 9 introduces some wider questio I will try to answer these under general headings.

Definition.—Two types of proprietary medicines a generally recognised: (1) "ethical" preparations, s mainly on doctor's prescriptions, orders, and recor mendations, and not advertised to the lay public; a (2) preparations suitable for use without medic supervision, which can be described as "domestic proprietaries. (These two types are identified by t Chemists Federation as "class A" and "class B products.)

Uses, Including N.H.I. Prescribing.—Dr. Forster correct in saying that the more dramatic advances ethical proprietaries) were accepted under N.H.I., b his examples did not indicate the general attitude of t Ministry to these preparations. My article contain data (apparently ignored by Dr. Forster) which provid reasonable proof that the methods used to check excessi prescribing resulted in a loss of professional freed and responsibility.

Domestic proprietaries often provide a useful mea of treating minor ailments, and to bring every min disorder under medical control would seriously embarr both the medical profession and the Minister.

Methods of Control.—The Medicine and Pharma Act, 1941, the Food and Drugs Acts, and the Labelli of Foods Order, 1946 (and amending Orders), requ the disclosure of the composition of proprietaries, b there are no criteria for the official or non-official rec nition of ethical proprietary medicines such as t approved list of the American Council on Pharma and Chemistry. My suggestion was an advisory body the Minister to provide expert interpretation, whe required, of the criterion "significant therapeut advantage" (over existing *B.P.* preparations). Dr. Forst and I at least agree on the principle of a separate bod

Domestic proprietaries are controlled (1) in respe of composition, as detailed above; (2) by statuto restrictions prohibiting the non-medical treatment certain diseases specified in the Venereal Diseases A 1917, the Cancer Act, 1939, and the Pharmacy a Medicines Act, 1941; (3) in part by the standar which have been set up by such bodies as the Chemis Federation, advertising associations, and others.

The Chemists Federation has been mainly concerne with domestic proprietaries, but I must correct D Forster's assumption that the federation's purpose merely to promote the sale of proprietary preparation There are two kinds of monopoly—that which is justifie by serving the public interest and that which is no The monopoly which the federation attempts to establis for pharmacists in respect of the distribution of propri tary medicines finds its justification in the specialise knowledge of the pharmacist and the standards lai down by the C.F. Standards Committee[1]—probabl the most significant contribution yet made towards th elimination of abuses attending the sale of this class o proprietary preparation. I must also question D Forster's statement that the federation cannot complete serve two masters—the medical profession and th trade. Doctors are not directly interested in th domestic proprietary, but I am sure Dr. Forster wil agree that if both doctors and the pharmaceutica industry are serving the public welfare there will be no fundamental diversity of interests.

Pharmacy.—Dr. Forster has not, I think, taken into account the many highly specialised techniques and

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[1] *Work of the Standards Committee.* Obtainable from the secretar Chemists Federation, 4/5, Queen Square, London, W.C.1.

) Mr. B, who had had a severe but symptomless methyl- acil neutropenia, showed an exactly similar pig- ion.

In 8 of the cases (3 non-thyrotoxic, 1 thyrotoxic ted with methyl thiouracil who had shown no toxic toms, and 4 thyrotoxic treated with methyl or l thiouracil who had shown toxic reactions) tests performed as described above but, in addition, were ted with sterile distilled water instead of methyl or l thiouracil for all injections. They were read at ame intervals as before and were all negative.

The fact that, in the cases investigated, skin tests were of no value is not surprising. In general, reactions are not constant or reliable in alimentary gy.[1] With the exception of true eczematous and, onally, true urticarial eruptions, it is generally ssible to predict by skin tests whether a person or will not show hypersensitivity to a given drug. do responses to skin tests indicate the type of clinical tion which may develop.[2]

the 8 above-mentioned cases total and differential ocyte counts were made before each of the four and at the time of each reading thereafter. One er test was performed on these patients—leucocyte ts were made at the same intervals after an trary fixed time, no injection having been given.

The number of cases in this series is far too small for eralisation. but test no. 1 showed that the total ocyte and absolute granulocyte counts fell more ipitously in the thyrotoxic patients who had iously shown toxic reactions (leucopenia and topenia) than in either the controls or the single otoxic patient on methyl thiouracil who had not iously shown toxic manifestations.

ther work is being done to confirm or refute our nal impressions.

e are indebted to Prof. E. J. Wayne and Dr. H. P. for access to their cases; and to Mr. H. J. Benzies his staff, and Dr. D. Hobson, for their help and technical tance.

eld.

E. K. BLACKBURN
J. F. GOODWIN
R. H. CANTER.

COMPULSORY ADMISSION

—This morning I was compelled to go to the e of one of the casualty officers of my hospital, had been ordered to admit a chronic patient to a existent bed by an individual, apparently a doctor, d to be speaking on behalf of the Emergency Service. If this is a foretaste of official policy, its implications should be clearly understood. years ago the world was shocked by revelations the workings of an institution run on a comparable ciple. Though I am not concerned to defend the al who was in charge of that institution, there was ce in his contention that, as he had no control admissions and his protests to central bureaucracy e ignored, he was not responsible for the overcrowding neglect within his walls. His name was Kramer his institution was at Belsen. Let us not build the e for the chronic sick of England.

X.Y.

**Since July 5, the Emergency Bed Service of the 's Fund has continued to assist doctors who ask its help with the admission of urgent cases to hospitals London. The E.B.S. has no power to compel any ital to admit a patient. On the other hand, a doctor been appointed to represent the Metropolitan onal hospital boards at the E.B.S., so that when no cant bed can be found for an urgent case he may l on the appropriate hospital to make special arrange- ts for the patient's admission. It seems to us that the boards must retain the right to do this, though in ent circumstances the right should be very sparingly ised. We should be interested to hear more about is "chronic patient."—ED.L.

REGIONAL SPECIALIST COMMITTEES

SIR,—It is only six months to the end of next March, and many regions have not yet formed a representative regional specialist committee which can be certain that its delegates to the central committee really speak for the region as a whole.

In the Liverpool region we have two associations, the Hospital Staffs Association and the Regional Hospitals Medical Association, that between them cover the majority of the specialists working in the region. These two bodies have sponsored a suggestion that the Liverpool Regional Specialists Committee be reconstituted with representatives nominated as follows:

2 by the Liverpool University faculty of medicine.
8 by the Hospital Staffs Association for the teaching hospitals.
8 by the Liverpool Regional Hospitals Medical Association for the regional board hospitals.
2 by the north-western branch of the Medical Superintendents Society.
2 by the registrars, 1 to be from the teaching hospital group and 1 from the regional hospital group.
1 from the Isle of Man.

This will give a completely representative committee, and we believe that all sections will feel satisfied. We hope that any above the rank of house officer who are not already members of the Regional Hospitals Medical Association, if employed in a regional board hospital, will join us.

We are most anxious that the old difference between voluntary and municipal hospitals should not reappear in a different guise in those now set up, and we welcome the coöperation that we have received from the Hospital Staffs Association.

V. COTTON CORNWALL
Hon. Secretary, Liverpool Regional Hospitals Medical Association.

The Poplars, Lower Lane, Liverpool, 9.

THE YOUNG CONSULTANT

SIR,—It is interesting and an occasion for sympathy to read in your leading article of Oct. 16 of the meagre amount paid to general practitioners in the first quarter of the National Health Service. But the plight of the junior consultant is considerably worse than that of the general practitioner. Having spent double the time learning his job, and a not inconsiderable sum on instruments, consulting-room, and a dwelling-place, the young consultant finds that private practice has practically vanished. Conversely, hospital work has increased and a considerable amount of time and petrol has been consumed since July 5 in journeys to cottage hospitals and on domiciliary visits, to say nothing of telephone calls, stationery, and the like. The only acknowledgment of claims for payment so far received is a reference to certain domiciliary visits which are apparently not allowed for payment!

Incidentally, a promised interim payment of the staff of my hospital is still owed from July, 1947. It would be interesting to see what would be the result if sections of the so-called working class were kept waiting for fifteen months for their wages.

JUNIOR PROVINCIAL CONSULTANT.

MEDICAL RECORDS

SIR,—As a medical student, and later as a junior resident, one had the impression that potential ability was largely assessed by the accuracy and completeness of one's case-notes. Slovenly notes implied a slovenly student or house-physician, and such records used to be torn to shreds verbally and actually before an awe-struck assembly of clerks or dressers. This attitude of the chief was surely correct. Complete records can only proceed from a complete anamnesis and examination—the twin foundations of medical craftsmanship.

It would perhaps be too harsh a generalisation to translate this thesis into broader terms and state that the work of a hospital may be appraised by its clinical records, yet it is quite certain that no hospital can fulfil its purposes to best effect when encumbered by archaic methods of record-keeping. The truth of this is apparent to anyone who has experienced the contrast of work in hospitals well served and badly served in this respect.

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[1] Dameshek, W., Colmes, A. *J. clin. Invest.* 1936, 15, 85. Holten, C. *Amer. J. med. Sci.* 1937, 194, 229.
[2] 1945 Year Book of Dermatology and Syphilology. Chicago; p. 27.

patients its criterion of efficiency. Perhaps such a hospital would experience a rise in the number of relapsed patients who had to be readmitted; unless, indeed, they took their troubles to other institutions where results were measured in terms of health and comfort and not in numbers.

If we had to live in a house which a jerry-builder had run up on inadequate foundations in a few weeks, we should not esteem him the better workman merely because he turned out houses faster than one who built well and truly. The implications of this are infinitely more important in the building up of health and happiness.

MURIEL M. EDWARDS
Secretary,
Nursing Recruitment Service,
King Edward's Hospital Fund.

21, Cavendish Square,
W.1.

ABORTION, STERILISATION, AND THE LAW

SIR,—The following case seems to me to be of sufficient general interest to merit discussion in your journal, and to show the necessity for a change in the present laws concerning abortion and sterilisation.

Miss X.Y., aged 31, was brought to me by her mother, with a request that I should terminate the pregnancy and sterilise the patient. She had been referred to me by two specialists in psychiatry, to one of whom she had been referred originally by her own family doctor.

The family doctor certified as follows: "I have known Miss X.Y. for ten years. She is mentally deficient and unstable and is now pregnant by an unknown man. I consider that the pregnancy should not be allowed to continue, and, as the same thing may occur again owing to her disposition, that she should be sterilised." This letter was accompanied by a letter from the rector of her village, who said: "I have known Miss X.Y. for the past ten years and have had close contact with her family for the same length of time. She is, in my opinion, unbalanced mentally, and completely unfit mentally to be responsible for the care and upbringing of a child."

Psychiatrist no. 1 certified: "I consider this patient quite unfit to proceed with her pregnancy on account of her psychiatric condition. She is mentally and emotionally unfitted for motherhood on account of her limited intelligence and emotional development. This is, in my opinion, a clear case for the termination of pregnancy and sterilisation." The second psychiatrist wrote: "The patient is very limited in intelligence and is emotionally unstable. She would be unable to look after a baby and is likely to harm it during a temper outburst. I recommend termination of pregnancy and sterilisation."

After interviewing the girl myself, I had no hesitation in agreeing that it was clearly desirable, in the girl's own interest and in the interests of the community, that the pregnancy should be interrupted, and that she should be rendered incapable of becoming pregnant in the future. But, remembering the famous case of the American millionaire's daughter who, some ten or twelve years ago, took action against her mother, who had had her sterilised, and against the doctor who had performed the operation, I wanted to make quite sure that I was not rendering myself liable either to a criminal charge, or to a civil action.

I therefore sought the advice of the Medical Defence Union, the secretary of which pointed out that none of the other three doctors or myself had certified that the continuation of the pregnancy would endanger the life, or the mental or physical health, of the mother herself, and that therefore there was no legal ground for terminating the pregnancy. He also pointed out that it was not clear whether the patient was, or was not, really capable of giving valid consent, either to termination or to sterilisation.

After exhaustive discussion, we decided, very reluctantly, that we could not safely perform either operation.

The Act forbidding abortion is far from clear. It forbids "wrongful" termination of pregnancy, without defining the meaning of the word wrongful. The interpretation generally accepted is that it is wrongful unless the continuation of the pregnancy seriously endangers the life or health of the mother. And none of us has the courage to terminate a pregnancy in a case like the present one, and so run the risk of imprisonment and loss of the right to earn our livelihood by the practice of our profession. Nevertheless, I cannot believe that any court wou find a surgeon guilty if he were to terminate the pregnan in such a case, supported, as it is, by the opinions of t patient's own usual medical attendant, her spiritu adviser, and two psychiatrists of standing.

With regard to sterilisation, the law is equally vag Some medicolegal authorities are of opinion that sterilis tion of a man or woman, sane and adult, with t patient's consent, could be regarded as *mayhem*, b according to the *Encyclopædia Britannica*, mayhe signifies an assault "whereby the injured person deprived of a member proper for his defence in figl e.g., an arm, a leg, a fore tooth, etc. The loss of an e jaw tooth, etc., was not mayhem." I do not see h sterilisation, carried out by cutting and tying the sper ducts in the male, or the fallopian tubes in the fema could possibly be interpreted as mayhem, and I belie that the voluntary sterilisation of a sane adult is n *forbidden by English law.*

But an insane or mentally defective person is render incapable, by the very fact of insanity or mental de ciency, of giving valid consent; so, in the very ca where sterilisation is most desirable, it is not permitt

Is it not time that the profession should move for t alteration of the laws relating to both abortion a sterilisation?

NORMAN HAIRE
President, Sex Education Societ

London, W.1.

TESTS FOR THIOURACIL SENSITIVITY

SIR,—There is no known régime which will guaran freedom from toxic complications, including neutropen during thiouracil therapy. Hence a simple method differentiating susceptible and non-susceptible peo would be of great value.

It occurred to one of us (E. K. B.) that skin tests association with serial leucocyte counts might fulfil t function. After consultation with Messrs. Genato Ltd., Mr. H. J. Benzies, chief pharmacist at the Ro Infirmary, Sheffield, prepared sterile solutions of met thiouracil (1/2000) and of propyl thiouracil (1/10 in distilled water. Sterilisation was effected by steam for 30 min. The preparations were put up in rubb capped bottles and kept in the refrigerator when not use, no preservative being added. Crystals occasiona separated out in the cold, the above-mentioned conce trations being near saturation level in each case. Ho ever, the crystals redissolved when the bottle was pla in warm water for about a minute.

The subjects for the tests were divided into t following groups:

(1) Non-thyrotoxic persons, 18.

(2) Untreated thyrotoxic patients, 3.

(3) Thyrotoxic patients treated with methyl or prop thiouracil who had shown no toxic reactions, 6.

(4) Thyrotoxic patients treated with methyl or prop thiouracil who had previously developed toxic ma festations, 4.

Throughout the tests the subject rested quietly in bed in a chair, no food or drink being taken, and smoking n being allowed.

Each person was submitted to *two tests:*

(1) Into one forearm 0·1 ml. of 1/2000 methyl, or 1/10 propyl, thiouracil was injected intradermally and a simil amount of sterile distilled water was injected intradermal into the other forearm as a control. Treated patients we injected with the type of thiouracil that had been given duri treatment.

(2) As in (1), except that the injections were given su cutaneously.

Readings were made after 5, 20, 40, and 60 min., an 24 and 72 hours.

These tests gave completely negative results, with tw exceptions:

(1) Mrs. A developed a light-brown pigmentation at th site of the intradermal *methyl-thiouracil* injection, aft 72 hours. This gradually faded in the next few days. Th patient had previously had agranulocytosis accompanied b a generalised erythema, following treatment with meth thiouracil.

children from Dr. Barnardo's Homes can have tment for bone diseases. His appointments included of consulting physician to the Murray Convalescent . Old Windsor, and medical referee to the Scottish ows' Fund and other assurance societies, and he d on the Home Office committee which inquired the working of the Acts for the treatment of ates. In the Hunterian society he held office president.

of the earlier motorists, he was a founder member Brooklands, and in his youth he was an enthusiast ine sports. He married in 1896 the widow of J. H. Honeyman, of Auckland, and they had twin ters. Lady Bruce-Porter died in 1937, and on her h he retired from practice to give even more time his social work, and to health education. In 1938 de a world tour during which many of his war-time ice patients were able to welcome him to their own tries. He was appointed C.M.G. in 1917 and created E. in 1919.

THE LATE DR. WESTERN

Paul Fildes writes: Dr. George Western started career as an assistant in Prof. William Bulloch's rtment at the London Hospital at a time when 's opsonic teaching was in its early stages. He collaborated with Bulloch in some early researches when I first met him in 1906 was in charge of the culation department." This department consisted Western and only Western. When 28 years later I the London Hospital "Father" Western was still in the same small room, imperturbable, reliable. wise. The "inoculation department" gradually d out and Western took over most of the contacts patients, both therapeutic and diagnostic. He made claim to being a "research-worker" but he became extremely sound and honest exponent of clinical riology. He had a high degree of technical skill was probably the first to use venepuncture as a clinical method, at a time when that sort of tory aggression was viewed somewhat askance. these methods he certainly advanced knowledge of al fever. His nickname sufficiently describes the towards him of his younger contemporaries. He ver assertive but was always there. I was not d to hear that during the recent war his sense of withdrew him from retirement in the country to a sion in the R.A.M.C.

Births, Marriages, and Deaths

BIRTHS

—On Oct. 12, in London, the wife of Dr. Trevor Beard—a son.

—On Oct. 10, at Guildford, the wife of Dr. I. A. B. Cathie—a daughter.

—On Oct. 7, at Cardiff, the wife of Dr. G. R. Davies—a son.

—On Oct. 13, at Wigginton, Oxon, the wife of Dr. G. E. Dixon—a son.

—On Oct. 9, in London, the wife of Dr. Philip D'Arcy Hart—a son.

—On Oct. 11, the wife of Dr. T. S. Rodgers—a son.

—On Oct. 15, the wife of Dr. A. P. Tait—a son.

MARRIAGES

—USHER.—On Oct. 12, at Richmond, Yorks, Kenelm Digby surgeon captain, R.N. retd., to Mrs. Constance Usher.

—WICKENS.—On Oct. 15, at Wimbledon, James Angwin Ely, B.M., to Margaret Joan Wickens.

—ABBEY.—On Oct. 12, in Edinburgh, Michael Oliver, M.B., to Margaret Yool Abbey, M.B.

—WALKER.—On Oct. 2, at Whitley Bay, Basil Rowlatt, M.B., to Sybil Walker.

—MILLER.—On Oct. 14, at Coulsdon, Jeremiah Nicholas M.B., to Norah Catherine Miller, M.B.

DEATHS

PORTER.—On Oct. 15, in Somerset, Harry Edwin Bruce Bruce-Porter, K.B.E., C.M.G., M.D. Brux., aged 79.

BAKER.—On Oct. 14, at Waterlooville, Hants, Lyster Cole-Baker, B.A., M.D. Dubl., aged 83.

—On Oct. 13, Cecil Pryor Lankester, M.R.C.S.

—On Oct. 11, at St. Leonards, John William Scott Macfie, M.B., D.Sc. Edin., D.T.M., aged 69.

—On Oct. 14, at Aldington, Kent, Arthur Craigie McVittie, M.B. Dubl.

—On Oct. 14, at Bideford, Albert Edwin Hayward Pinch, M.B. Brist., F.R.C.S., D.M.R.E., captain, I.M.S. retd., aged 81.

—On Oct. 15, Arthur Harold Shepard, M.D. Dubl.

—On Oct. 11, at Bournemouth, William Legge Symes, M.R.C.S., aged 82.

Notes and News

PROTECTIVE FEARS

As the structure of the mind becomes plainer psychologists are able to generalise and classify. It is perhaps unfortunate that in the babel of medical jargon psychologists speak with a particularly obscure tongue—one that often prejudices or defeats doctors, and is presumably even less comprehensible to the layman. In his book *Conquer Fear*,[1] Mr. John Langdon-Davies sets out plainly what is now known about anxiety, irrational fears, panic states, loss of the sense of reality, and the like, and does it so well that doctors no less than laymen may be glad to read about them. He quotes many letters from the hundreds sent to him when he was writing on this subject in the *People*, and these will be of great help and comfort to people suffering from anxiety states, for they show how common such terrifying symptoms are, and how closely the pattern can repeat itself. This in itself would have been worth doing, for such people suffer a great sense of loneliness and isolation. Since their other great dread is of insanity he has wisely included one letter from a psychotic patient, to show how different are insane beliefs from those associated with anxiety; but he is careful to explain that this condition too can be treated with good hopes of success.

Books like this have been written by psychiatrists and doctors from time to time, though perhaps none with such good understanding of what the patient feels or what kinds of things he is hungry to be told. Mr. Langdon-Davies does more, for he gives some advice—and very sound advice too—on the management of these fear states by those who are suffering them. No doctor need be offended by the way he does it. He explains how impossible it would be to provide adequate psychiatric care for the large numbers affected, and makes it clear, in a tactful way, that many general practitioners simply have not been trained to deal with cases of "fear sickness"; moreover, most of them simply have not the time to do more than exclude serious physical disease and reassure the patient with a stock phrase or two. These people must either do what they can for themselves or go on for years in a crippled state.

He explains simply that these fears have a use for the patient, in that they protect him from some more painful repressed memory. What this may be they are never likely to find out: they must be content to strengthen their position in other ways. He suggests that they should write down their plans in a notebook, setting out the nature of their fears and the occasions on which they arise. Psychosomatic symptoms, once the doctor has explained they are not organic, can be looked at objectively; and depression, fatigue, boredom, and the inability to love can be related to family history and childhood memories. Here for the first time Mr. Langdon-Davies is a little obscure: it is not quite clear what the patient is to do with all the material he uncovers; for though no doubt he will ultimately be relieved merely by remembering and facing it, he will certainly have periods of increased anxiety while he is about it. This is not brought out. One important point is made extremely well, however. Many of these patients feel they are short of love; but their need is not merely, or even chiefly, to receive love but to find somewhere to put the love they have to give. If the family or friends offer no-one who can accept this affection, then it must be placed elsewhere—in socially useful work, if need be. The guilty child who is at the bottom of our irrational fears is sustained and relieved by the knowledge that he is some good to his kind.

The book should be read by relatives as well as patients, for it will make them realise that the patient is ill in the same way as if he had pneumonia or a broken leg; and it contains a good chapter on prophylaxis.

SOCIAL AND PREVENTIVE MEDICINE IN ENGLAND

THOSE who attended Sir Arthur MacNalty's FitzPatrick lectures at the Royal College of Physicians during 1946 and 1947 now have an opportunity to refresh their memory, and those who were not present will enjoy the chance of reading his careful account[2] of *The History of State Medicine in England*. The lectures cover the time from the accession of Queen Victoria in 1837 to the foundation of the Ministry

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1. London: Feature Books. 1948. Pp. 173. 5s.
2. Published by the Royal Institute of Public Health and Hygiene. 1948. Pp. 82. 12s. 6d.

The report of the King Edward's Hospital Fund [1] will therefore be welcomed by clinicians working in hospitals where the term "records officer" is as yet meaningless. Throughout the country the advent of the National Health Service must have tended to freeze administrative initiative, and on the subject of medical records the Ministry has offered no advice. In this, as in so many other matters worthy of prompt attention, "awful darkness and silence reign over the great Gromboolian plain." Let us hope that the report may be followed by an efficient and nation-wide directive to hospital management committees, laying down the broad principles along which record departments should be planned, but leaving the initiative of reorganisation at the periphery.

Wolverhampton. J. V. S. A. DAVIES.

DENTURES AND ANÆSTHESIA

SIR,—From the Dark Ages nurses have been taught to remove the patient's dentures before the administration of an anæsthetic. The edentulous patient is left with sunken cheeks and loose, floppy, flapping lips. The sunken cheeks prevent a close fit of mask to face. The flapping lips obstruct the airway. In laryngoscopy for intubation, the laryngoscope may cut the gum and slip from side to side. If the denture be left in place laryngoscopy is more easily accomplished, and the teeth can be protected by a piece of strapping. For the past ten years I have made a practice of leaving all *full* dentures in position, without accident of any kind.

Last, but not least, some lady patients suffer intense distress when appearing in the theatre as "toothless old hags," as one poor victim put it. There can be no risk in leaving a full set in position so long as the anæsthetist knows they are there. He is no anæsthetist if he has not looked.

Carshalton. H. PARRY-PRICE.

Obituary

JOHN WILLIAM SCOTT MACFIE

M.A. CAMB., M.B., D.SC. EDIN., D.T.M.

WE have to record the death at St. Leonards on Oct. 11 of Dr. J. W. S. Macfie, a worker of eminence and erudition in many branches of tropical medicine. Born in 1879, he was educated at Oundle, at Cambridge, and at Edinburgh, where he graduated in medicine in 1906. After working in various laboratories, including the physiology laboratory at Liverpool under Sherrington, his interests turned to tropical medicine. He took the diploma in tropical medicine at Liverpool in 1910 and then went to West Africa, where he served on the medical staff from 1910 to 1923 and was director of the Medical Research Institute at Accra from 1914 onwards. During this time he contributed much to knowledge by his work on a variety of tropical diseases, especially trypanosomiasis and malaria. In 1917 he was seconded to the Liverpool School of Tropical Medicine to undertake special research on malaria, and in 1919 he was awarded the school's Mary Kingsley medal for distinguished achievement in the field of tropical medicine.

On retiring from West Africa Macfie joined the staff of the Liverpool School of Tropical Medicine as lecturer in protozoology, and later he worked on the chemotherapy of malaria, under the ægis of the Medical Research Council, at the London School of Hygiene and Tropical Medicine. In 1935, despite failing health, he went to Ethiopia as a member of the British Red Cross unit serving in that country; a record of those experiences was subsequently published in *An Ethiopian Diary*. In 1941, on his insistent request, he was appointed to the Royal Army Medical Corps for overseas duty, and he served with distinction in nos. 3 and 8 malaria field laboratories in Egypt and in the Middle East as a malariologist until a breakdown in health in 1943 obliged him to return to this country. Here he renewed his old interest in taxonomic studies at the British Museum; and he went back for a short time to the Liverpool School of Tropical Medicine, where he was engaged in preparing an instructional film on malaria. Macfie was a world authority on the midges (Cera pogonidæ), and was largely responsible for the ident cation and classification of the collection of these ins in the British Museum. Tall and ascetic, he ha kindliness and an unassuming mien that endeared equally to his contemporaries and to his junior colleag many of whom recall with gratitude his unostentati benefactions.

CHARLES EDWARD LACEY

M.B. LEEDS, D.P.M.

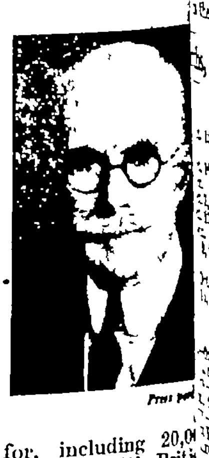
Dr. C. E. Lacey died on Oct. 3 at the age of 29 at National Hospital, Queen Square, where he was regis of the psychiatric department. A Yorkshireman, he educated at Knaresborough Grammar School and Leeds University, where, after earning many distinct and scholarships, he graduated in 1942. Six mo later he joined the Army, in which he served till 1 and as section officer of a parachute field ambul he took part in the invasion of Europe. After a ye training in general medicine in Leeds and Bradford was awarded a fellowship in psychiatry at Crich Royal, Dumfries.

W. M.-G. writes: "Strict and critical with him kind and cheerful with others, Lacey was imbued an ardent love of life. His keen and penetrating m his quick grasp of essentials, and his natural gift physician gave legitimate hope that a useful career before him as a specialist of academic standing. Certa psychiatry can ill afford to lose a young man of ability and character."

Dr. Lacey married Dr. Gaynor Jones, who is als psychiatrist.

HARRY EDWIN BRUCE BRUCE-PORTER

K.B.E., C.M.G., M.D. BRUX., M.R.C.S.



Sir Bruce Bruce-Porter, who died at his daught home in Somerset on Oct. 15 at the age of 79, will widely remembered for his forceful but kindly personal his zeal in many good causes, and his ability to public attention for them. He was born at Woolw the son of Captain J. Porter, R.A. At the London Hosp he won scholarships in anatomy, physiology, and clin medicine, and also the Duckworth Nelson scholarshi practical medicine and surgery. He qualified in 1892, two years later, after postgraduate study in Brussels Vienna, obtained his M.D. Brux. with distinction. At the Army Medical School at Netley in 1893 he obtained honourable mention in military medicine, clinical medicine, and surgery. After holding a commission as surgeon captain on the Army medical staff he returned to civilian practice, but he retained his connexions with his old service both as a Territorial and as physician to the King Edward VII Hospital for Officers. When war broke out in 1914 he held the rank of lieut.-colonel and was placed in administrative charge of the 3rd London General Hospital at Wandsworth. In this hospital, which ultimately had 2600 beds, many Dominion troops were cared for, including 20,0 Australians. In 1916 he commanded the 40th Briti General Hospital in Mesopotamia. For many years h was a military member of the council of the Territori Force Association in London.

Bruce-Porter's military background made natural th devotion he gave to the work of the St. John Ambulan Association and the Red Cross, of whose joint coun he was formerly a member. A knight of grace of th Order of St. John of Jerusalem in England, he was member of the order's general chapter. But his wor for charity was many-sided: he helped to secure reco nition for blind masseurs, he was vice-president the Shaftesbury Society and Ragged School Union, and he gave special interest to the Bruce Porter Hom

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[1] Some Observations on Hospital Admissions and Records. London, 1948. See *Lancet*, Oct. 9, p. 578.

ity of Liverpool

Oct. 15 the following degrees were conferred:

—J. R. MacLeod, D. E. Paterson.

ersity of Sheffield

John Chisholm, who has held the chair of obstetrics gynæcology since 1935, has become part-time director department of obstetrics and gynæcology. He will to hold his post on the staff of the Jessop Hospital. William Hobson has been appointed to the new chair and industrial medicine.

Hobson, who is at present senior lecturer in preventive in the University of Bristol, and honorary assistant officer of health to the city of Bristol, took his B.Sc. at first-class honours in 1933. Three years later he took and became lecturer in physiology and hygiene in the of Leeds, a post which he held till 1938, when he was assistant school medical officer for Leeds. The following year, he also took his M.D. with distinction, he became assistant Hampshire, and in 1940 M.O.H. for Lymington. From 1945 Dr. Hobson served in the R.A.M.C. as a specialist and he was mentioned in despatches. His published a paper on urinary output of creatine and creatinine with physical exercise and its relationship to carbohydrate

Tom Smith has been appointed temporary lecturer and gynæcology. Dr. Jeanne Montgomery to the medical officer for the student health service, J. B. Pyper demonstrator in anatomy. Dr. J. A. Dr. D. H. Randall, and Dr. J. Maclean Smith have tutors in medicine, surgery, and medical pathology and Dr. J. K. A. Beverley and Dr. Sheila M. honorary demonstrators in bacteriology.

College of Surgeons of England

a meeting of the council held on Oct. 14, with Lord Johnson, the president, in the chair, Prof. Geoffrey was admitted as Sir William Collins professor of and comparative pathology, and the John Tomes presented to Prof. H. H. Stones, Liverpool. The in dental surgery was awarded to Dr. Harvey H. Canada, and Prof. B. Gottlieb, Austria.

J. H. Dible was appointed examiner in pathology forthcoming primary fellowship examination in Ceylon. of membership were granted to R. B. Heisch, and D. H. K. Soltau. The following diplomas ted jointly with the Royal College of Physicians:

—T. S. Adisubramaniam, M. A. C. Dowling, William Gunn, ta, E. T. Harrison, G. O. Hughes, T. H. McCormack, ller, J. B. Sherman, J. A. Smiley, J. M. Stuart, A. R.

M. & H.—C. S. Agrawal, M. H. S. E. Amroussi, Norah H. C. P. Courtenay-Mayers, K. O. Courtney, R. M. Cross, H. G. Edmunds, Walter Fabisch, J. D. Grene, J. T. G. F. Houston, M. H. Hughes, S. A. Jones, Ronald Lwin, McHugh, B. U. Mistry, Mok Hing Yiu, Radhagovind Mariano Rech, A. S. Saffar, M. A. E. Sayed, S. C. Sekar, F. K. Shah, W. D. L. Smith, M. L. Sur, Eustachy G. H. Wattley, Wu Hsueh-Tsung.

M.S.—P. C. Agarwal, A. N. Ashworth, N. L. Bailey, S. C. G. M. Barling, B. A. Bembridge, T. A. S. Boyd, R. S. E. J. B. Bunting, Thomas Chadderton, R. M. Chambers, Chan, P. M. Chaudhuri, E. S. Dismorr, N. F. Donaldson, J. H. W. Fagan, P. I. Franks, Samuel Galbraith, mley, T. B. Gupta, Ko Gyi, Andrew Harrison, J. R. P. J. L. Hunter, R. I. Jaffe, K. R. Kesavachar, T. G. rell Lerner, H. F. T. MacFetridge, B. A. Marshall, Mohammad Mohsin, Louis Myers, W. J. Naunton, kiewicz, Eithne J. O'Riordan, C. M. Phillips, S. T. J. E. Pyper, J. L. Reiss, Kazimierz Rubinstein, Hamida A. E. Sawday, Mohamed Shafi, Ellis Shenken, N. I. C. S. Swan, Jack Swartz, A. K. Tulloch, J. M. Whaites,

—H. C. Allan, Sivasithamparam Balasingam, Marion B. Saktipada Bhattacharjee, Camilla B. P. Bosanquet, E. J. S. N. Briggs, F. B. Bromfield, H. J. S. Brown, Brown, M. F. G. Buchanan, L. J. Bussell, Helen A. A. B. Christie, Margaret T. Collins, W. D. D. Cooke, shaw, J. U. Crichton, P. O. Crossfield, G. H. R. Curnock, Davies, A. W. Dickie, M. H. C. Dyson, P. D. Fergusson, Ferris, H. J. W. Fisher, I. H. Fletcher, J. O. Forfar, A. Fouracres, Gin Shan-Yeh, Janet F. Graham, J. R. Dorothy A. Harvey, K. W. Hazratji, Betty E. Howarth, Hudson, Pauline M. Jackson, J. C. Johnson, R. St. J. R. Goral Kirtane, Stephanie A. Laing, B. M. Laurance, Richard Lindop, R. H. G. Lyne-Pirkis, Kathleen J. Muriel M. McLean, H. B. Marsden, Margaret St. C. Gladys A. Meigh, Rachel Menashe, S. M. Merchant, A. Michelmore, Dorothy J. Miller, R. G. Mitchell, E. S. J. N. Montgomery, Norrene M. Nicholson, W. B. O'Driscoll, Jack Pelunsky, A. P. Radford, Elizabeth Radovitch, Short, G. A. V. Ribeiro, Frank Riley, B. S. Rose, Mutarika Shah, Gwendolen D. Smith, Peter Stevens, land, P. V. Suckling, Jean C. Taylor, K. B. Thornton, C. H. C. Upjohn, D. F. Van Zwanenberg, D. G. G. F. Walker, J. M. Watt, L. E. Wear, S. D. V. Weller, Jean C. Willison, B. S. B. Wood, L. A. Zeki.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Oct. 1, with Sir William Gilliatt, the president, in the chair, the honorary fellowship was conferred on Dr. Emil Novak of Baltimore. Dr. A. F. Hollinrake (Ontario) was admitted to the fellowship, and the following to the membership:

I. S. R. Bain, Henrietta E. Banting, T. L. S. Baynes, Samuel Behrman, D. C. A. Bevis, C. C. Bowley, T. St. V. W. Buss, L. W. Cox, Mary E. Egerton, T. E. Elliot, G. McL. Forsyth, H. D. Freeth, G. T. Gibson, J. H. Gibson, Andrew Graham, A. H. Grenz, Constance A. Grey, H. B. Hattam, C. C. Henneberg, Ebbie Hesselberg, D. W. Hirson, J. C. Holman, K. R. Hudson, A. G. Jones, J. B. Joyce, W. T. Kenny, G. G. Kerster, R. A. H. Kinch, Samuel Lask, T. L. T. Lewis, E. L. F. McConnachie, William Macfarlane, J. M. McKiddie, S. H. Madden, Helen M. Mayer, G. W. H. Millington, F. L. E. Musgrove, J. R. Norris, J. J. F. O'Sullivan, J. H. Patterson, A. C. Pearson, W. H. Peck, S. D. Perchard, David Pryor-Jones, E. H. Rees, S. McR. Reid, H. A. Ripman, D. N. S. Robertson, B. W. Sanderson, G. A. Silley, A. A. Smith, Tom Smith, G. J. Sophian, Christine M. Stacey, P. C. Steptoe, C. S. N. Swan, R. A. Thatcher, G. S. Thomas, R. G. Whitelaw, R. M. Williams, M. S. Williamson, H. G. Wolskel, P. S. Wright, R. B. Wright.

A postgraduate course in the practice of obstetrics and gynæcology will be held at the college from Nov. 15 to 19. Further particulars will be found in our advertisement columns.

Royal Medico-Psychological Association

On Friday, Nov. 12, at 2.15 P.M., at 26, Portland Place, London, W.1, Mr. Claud Mullins, late Metropolitan police-court magistrate, will deliver the Maudsley lecture. He is to speak on Psychiatry in the Criminal Courts.

Pharmaceutical Society of Great Britain

Dr. C. H. Hampshire, secretary of the British Pharmacopœia Commission, will speak on the British Pharmacopœia, 1948, at a meeting to be held at 17, Bloomsbury Square, London, W.C.1, on Thursday, Oct. 28, at 7.30 P.M. The lecture will deal generally with the pharmacopœia, as an introduction to a course of seven weekly lectures.

Public Health and Municipal Engineering Congress and Exhibition

Mr. Aneurin Bevan, the Minister of Health, will open this congress and exhibition at noon on Monday, Nov. 15, at Olympia. The Ministries of Works, Food, and Agriculture and Fisheries and the Department of Scientific and Industrial Research, are to be among the 168 exhibitors. The congress and exhibition will continue until Nov. 20.

More Nurses and Midwives

Full-time nursing and midwifery staffs in hospitals in England and Wales have risen by 2000 in twelve months. In June, 1948, the total, including those trained and in training, was 117,000, compared with 115,000 a year earlier. Part-time nursing and midwifery hospital staffs over the same period rose by nearly 7000—from 10,700 to 17,380. These increases have made it possible to reopen beds closed through lack of staff, and of the 63,000 previously out of action for this reason nearly 6000 were again available for patients by June this year. The Ministry of Health says: "The point has now been reached when every addition to the hospital nursing and midwifery staffs means either the opening of more beds or the improvement of working hours and conditions, or sometimes both."

R.S.M. Microfilm Unit

Thanks to a generous grant from the Rockefeller Foundation and the practical help of the Ministry of Health, Board of Trade, and Foreign Office, a finely equipped microfilm unit has been completed at Dering Yard, off Bond Street, for the Royal Society of Medicine. At the inauguration on Monday evening Sir Henry Dale, F.R.S., the society's president, explained that its work of duplicating medical papers and other documents began in the late war, as a scheme for keeping base hospitals informed. Microfilm projectors were provided by the society at hospitals ranging from the Rhine to Delhi, and the Royal Air Force transported the films from London. A Rockefeller endowment in 1945 made it possible to apply the microfilm service to the big task of filling gaps in the journal files of medical libraries in Europe and elsewhere. Already 3500 unobtainable back-volumes of journals have been duplicated and supplied; and it is hoped that the present unit, with its production capacity of 25,000 pages on microfilm a day, will be able to meet the large number of orders still outstanding.

of Health in 1919; but since preventive medicine, though intimately linked with it, has a much longer history than State medicine, Sir Arthur has included, as an introduction to the volume, his presidential address to the Royal Society of Medicine's section of the history of medicine, in which he reviewed the growth of the preventive idea from the days of ancient Egypt and Greece up to the time of the Industrial Revolution and the great social reformers.

UNION OF ST. LUKE

WE have received the first periodical letter issued by the Union of St. Luke, which was founded this year and has the Bishop of Ely as its president. The union is a professional association of medical practitioners who are communicant members of the Church of England. "It aims to assist such practitioners by means of its fellowship to strengthen their Christian life and witness." The hon. secretary is Dr. R. H. Hardy, 5c, Parkhill Road, London, N.W.3.

CLEANER FOOD

AT their annual conference at Hastings on Oct. 14, the National Council of Women adopted a comprehensive resolution urging the Government to put an end to the loss of food by contamination, by making it compulsory for all local authorities to pass and enforce adequate by-laws for the protection and clean handling of all foodstuffs. The conference, says the *Manchester Guardian* of Oct. 15, also called on the Minister of Health to repeal the exemption clause in section 14 of the Food and Drugs Act, 1938, so that restaurants, inns, &c., would have to be registered in the same way as premises which sell cooked foods over the counter, and demanded a high standard of cleanliness and comfort in trains and railway refreshment rooms and improvement in the standard of food supplied in refreshment rooms.

NECROPSY ON A TRANSFIXIONIST

DETAILS have now been published [1] of the necropsy on Mirin Dajo, who, after surviving transfixion with swords and rods many hundred times, died after swallowing a dagger.[2] Œsophagoscopy revealed that the point of the dagger, which was nearly 14 in. long, had perforated the œsophagus, its blunt head being in the stomach. The dagger was removed by gastrotomy. The wound in the œsophagus healed, and on the seventh day, when the stitches were removed, Dajo seemed well; but about a week later he was found dead. Necropsy showed that local mediastinitis had arisen at the site of perforation and had led to erosion of, and hæmorrhage from, the aorta, which had presumably been scratched by the point of the dagger. Relics of Mirin Dajo's previous multiple transfixions were numerous pleural adhesions (but very few peritoneal adhesions), scars in the liver, and a single scar in the apex of the heart.

AMBULANCE AND FIRE SERVICES

THE Institute of Certified Ambulance Personnel, of which Dr. H. B. W. Morgan, M.P., is president, and Dr. W. W. Fox chairman, was set up to raise the standards of knowledge and service of ambulance personnel and "to minimise the needless pain and suffering which many patients have to undergo when they are transported in ambulances by men whose knowledge, training, and experience is below the standard necessary for their full efficiency." The institute rightly takes its responsibilities seriously, and a recent memorandum by Dr. Fox on the future administration of the ambulance service under the National Health Service Act discusses how far ambulance personnel can usefully be helped in their work by their colleagues, the members of the fire service. Coördination between the two services in the repair and maintenance of vehicles and intertelephonic communications would be welcome as an economy in man-power; but coöperation in the care of the patient is regarded with more reserve. Firemen are trained to deal with the restriction of fire on property and "their whole psychological outlook is one which is associated with destruction; hacking down of timber and using powerful jets." Handling the injured requires a high standard of gentleness and one cannot, Dr. Fox suggests, expect to develop these two qualities in the same person. His memorandum asks readers to consider "what qualifications you would like the individuals to have who would be responsible for your personal transportation."

HOMES FOR THE AGED IN LONDON

LONDON County Council has arranged to purchase houses for use as small homes for the aged. This is in pursu of the council's policy, under the National Assistance of establishing such homes in various parts of London wher they are needed. Each home is to accommodate not than 80 old people, and the aim is that they shall take siderably fewer. Development of the scheme is likely t slow, for no new building is to be undertaken, and the am of money to be devoted to conversion is restricted.

MALARIA CONTROL IN SARDINIA

THE Italian public-health authorities claim great str in the prevention of malaria in Sardinia (which is abou large as Wales), with the help of the Rockefeller Foundat by an attack on mosquitoes and their larvæ with D.D.T. 'Oktaklor.' [1] In 1946 there were 17,000 cases of malari the medical district of Cagliari, the southern capital of island. In 1947 the figure dropped to 6000, of which 1000 were primary infections, and in the first half of to 456 cases, of which only 21 were primary infections.

INTERNATIONAL SCIENTIFIC FILM CONGRESS

AS mentioned in our last issue this congress, held in Lon between Oct. 8 and 12, was attended by delegates 25 countries, who agreed to establish an International S tific Film Association. Among the matters to be consid by subcommittees are: (1) the establishment of an i national data card for compiling a master index of scien films available throughout the world and the formulatio methods of appraisal of these films; (2) the joint produc by a number of countries of films of common interest; (3) exchange and distribution of scientific films and the cust regulations affecting such exchange; (4) the setting up scientific film reference library; and (5) the exchang information between nations by means of a regular jou

SCHOOL OF PHARMACY

THE transfer from the Pharmaceutical Society of resp bility for the government of what has lately been kn as the College of the Pharmaceutical Society, was annou by Prof. H. Berry, the dean, at the opening of the new se on Oct. 6. The college, which is now reconstituted o independent basis within the University of London, be known as the School of Pharmacy. In addition to dean, the governing body has the following members:

Nominated by the university.—Mr. O. L. Brady, D.SC., Sir Arch Gray, F.R.C.P., Mr. J. B. Hunter, F.R.C.S., and Mr. G. B. D.SC., F.R.S.

Nominated by the academic board of the college.—Prof. G. Buttle, M.R.C.S., Miss Katharine Coward, D.SC., Mr. J. W. Fair PH.D., and Prof. W. H. Linnell.

Nominated by the Pharmaceutical Society.—Mr. W. S. Ho Mrs. J. K. Irvine, Mr. H. N. Linstead, and Mr. C. W. Maplethe

Coöpted members.—Sir Henry Dale, O.M., F.R.C.P., Mr. W. J Quarrell, and Sir Harry Jephcott (chairman).

Mr. S. R. Curtis has been appointed secretary to the sch

University of London

At a recent examination for the diploma in medical radio the following were successful:

J. C. Bulstrode, J. G. L. Cole, J. C. A. L. Colenbrander, J. Latto, Daniel O'Connell, J. H. O'Connell, Basil Stoll, R. D. St. Tucker, A. H. N. Wellkala.

Mr. G. Ewart Martin will deliver the Semon lecture 1, Wimpole Street, W.1, on Thursday, Nov. 4, at 4 He has chosen as his subject Broncho-œsophagology Great Britain.

On Tuesday, Nov. 16, at 5 P.M., Dr. Charles Swan speak on Rubella in Pregnancy as an Ætiological Factor Congenital Malformations and Stillbirth; and on Frid Nov. 26, at 5.30 P.M., Prof. Dugald Baird on Social Fact in Obstetrics. Both lectures will be given at the Westmin Medical School, Horseferry Road, S.W.1.

Royal College of Physicians of London

On St. Luke's Day, Oct. 18, Dr. F. M. R. Walshe, F delivered the Harveian oration which is summarised p. 660. After the oration the Weber-Parkes medal and pr were presented to Dr. S. Roodhouse Gloyne. This pr is awarded triennially for the best work done on the ætiolo prevention, pathology, or treatment of tuberculosis.

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[1] Bessemans, A. *Brux.-méd.* 1948, 28, 1945.
[2] *Lancet*, 1948, i, 891.

[1] Spallici, A. *Notiz. Amministrazione sanit.* 1948, 1, 205.

TREATMENT OF THYROTOXICOSIS

REVIEW OF 350 CASES

SIR CARRICK ROBERTSON
M.B. Lond., F.R.C.S., F.R.A.C.S.
F OF STAFF, MATER MISERICORDIÆ HOSPITAL, AUCKLAND,
NEW ZEALAND; CONSULTING SURGEON, AUCKLAND HOSPITAL

This paper is based on clinical observations on 350 of thyrotoxicosis treated between January, 1945. September, 1947.

During this period all patients with thyrotoxicosis re had suggested to them trial of the thio compounds, never it was thought likely that they would benefit but here lies the difficulty. At first there were no eria to guide one, and even now there are too few; , as experience grows, it is becoming a little easier dvise patients which course to pursue.

Of the 350 only 111 were treated with thiouracil; so this series the scales are rather heavily weighted on surgical side, the reasons being that many of the ients were sent by practitioners as cases for operation, the patients had already decided that they preferred gery to protracted medical treatment.

These 111 patients treated with thiouracil have been vided into three age-groups, since the younger patients em more often to achieve a permanent cure on thiouracil an do the older ones:

e-group (years)	No. of patients	No. improved
Under 21	16	10 (62%)
21–45	73	29 (40%)
Over 45	22	11 (50%)
	111	50 (45%)

the last group all the goitres were nodular and t of the patients had been thyrotoxic for years; y were bad surgical risks. The 11 patients who roved were very pleased with the result, in spite of ct that they still had palpable and visible goitres e were not entirely cured of fibrillation. Apart these 11 were others who had, in addition, a very blood-pressure. All of these hypertensive thyro were treated with thiouracil, and in none was blood-pressure lessened, nor did the treatment raise enthusiasm on the part of the patient. Those who equently underwent operation professed themselves h better, though there was still no great difference the hypertension—perhaps a somewhat similar experi e to that found in cases of hypertension treated by mpathectomy. The only thing this age-grouping shows slightly better response to thiouracil in the youngest up.

NTRA-INDICATIONS TO TREATMENT WITH THIOURACIL

On reviewing the failures of this treatment we now reasonably certain that the following are ntra-indications to the use of thiouracil:

(1) *Signs of Pressure on the Airway.*—In nearly every the goitre enlarges in the first few weeks of treatment th thiouracil. I have seen it stated that enlargement ly takes place when too large a dose of thiouracil been given, but I cannot altogether agree with s statement. I believe that, whatever dose is given, largement usually follows. A microscopical section a thyroid gland in a patient taking thio compounds ows hyperplasia of the cells lining the vesicles as great , and similar to, that seen in Graves's disease or primary yrotoxicosis. Therefore the first contra-indication to the exhibition of thiouracil is any pressure on the airway. This obstruction may be obvious to the merest tyro, in the cases with lateral displacement of the trachea or those with whistling inspiration, but even in a small oitre an insignificant nodule (see below) or a high pper pole (see below), unseen and impalpable because of its retrotracheal position, can cause considerable discomfort, which will be made worse when the goitre is increased by the administration of thiouracil. This is a cogent reason for preferring surgery, with its almost negligible risk, for all nodular goitres.

(2) *Toxic Nodular Goitre.*—All elderly patients with a toxic nodular thyroid gland have grown up with their goitre and little realise how ill they have become, because the change from simple to toxic goitre is slow and insidious. They are bad surgical risks and doubtless should be given the opportunity of thio treatment, but it must be granted that operation more quickly relieves shortness of breath by rapid improvement in the heart action and by removal of pressure on the airway. However ill these patients look when first seen, it is surprising how often they become safe risks after a week or ten days in hospital under suitable medical treatment; if they do not improve in that time, they are not safe risks. It is in these cases, and these cases only, that we practise a two-stage operation; and, if one's mind is made up before the surgical attack that a two-stage operation is safer, it is well to stick to that opinion, however easy and simple the first half of the operation may be. My own opinion is that toxic nodular goitre should be treated by surgery with very few exceptions.

There is little difference between the toxic symptoms of the hyperplastic and of the toxic nodular thyroid glands. Microscopically the nodular goitre is seen to have hyperplastic tissue in the parts of the nodules or surrounding tissue similar in all respects to the hyperplasia seen in Graves's disease. So, if thiouracil is good for one, why not for the other? The answer is that, though the symptoms may be relieved, the patient is not satisfied; and I offer the following explanation.

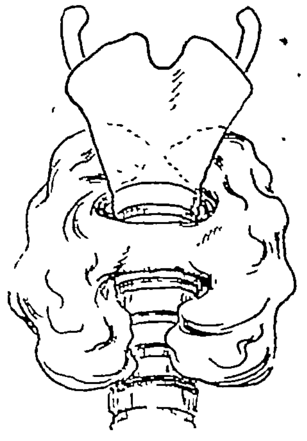

Diagram of upper poles of a toxic goitre winding round the back of the larynx. The right upper pole contains a small nodule or adenoma.

It is not uncommon to see, at operation on a large nodular goitre, an indentation or softening of the trachea as the result of pressure. But it does not appear to be commonly recognised that, even in small nodular goitres, a small nodule in the deeper part of the thyroid gland may have insinuated itself between the vertebræ and the œsophagotracheal tract. This cannot be seen or palpated until the gland has been exposed at operation. Whenever a nodule is found behind the trachea, it is shiny, glistening, and greyish, like a waterworn stone. Probably this appearance is due to thickening of the capsule by the up and down movement of the trachea during swallowing. In these cases there is no indentation of the trachea, but the nodule or the enlarged upper pole must cause discomfort, such as a tight feeling in the neck, often more obvious during swallowing.

(3) *Retrolaryngeal Upper Pole of Thyroid Gland* (see figure).—Several patients with hyperthyroidism and little apparent goitre, but only the smooth gland of Graves's disease, were treated with thiouracil for 2–4 months but refused to carry on and demanded surgery. They found difficulty in explaining why. According to the basal metabolic rate (B.M.R.) they should have felt better, but they were obviously unhappy and had an ill-defined discomfort in the neck—a sort of goitre-consciousness. At first it was thought that they were

No. 2 (Br.) General Hospital

The second reunion dinner for ex-members of this Army unit is being held on Saturday, Nov. 13. The organiser is Dr. J. H. Easton, 42, Pembury Road, Tonbridge, Kent.

Royal Institute of Public Health and Hygiene

Sir Lionel Whitby will deliver the Harben lectures at the institute, 28, Portland Place, London, W.1, on Tuesday, Wednesday, and Thursday, Dec. 7, 8, and 9, at 3 P.M. He is to speak on Hæmopoiesis.

Extra Food for the Tuberculous

The Ministry of Food has explained that patients with active tuberculosis are allowed each week, besides their ordinary rations, 1 oz. of bacon, ½ oz. of cooking fat, and 3 oz. of butter or margarine. They are entitled to three eggs and 14 pints of milk.

W.H.O. Regional Office

A regional office for south-east Asia is shortly to be set up by the World Health Organisation; this will serve India, Ceylon, Thailand, Burma, and Afghanistan. It is proposed that other regional offices should be established for Africa, the Eastern Mediterannean, the Western Pacific, and the American continent.

Rehabilitation: a Course for Foreign Visitors

The British Council is holding a course on Rehabilitation and Resettlement of the Disabled, which began in London on Oct. 18 and which will be continued at Mansfield and Birmingham. Some 20 visitors from Europe and China are attending the course, which was organised in response to requests from specialists in Europe who wished to see what Britain is doing in this field. The medical part of the course has been arranged by Dr. Harold Balme, medical officer in charge of rehabilitation, Ministry of Health.

Polarography in Biochemistry

A discussion on this subject will be held by the polarographic discussion panel of the Society of Public Analysts and Other Analytical Chemists at 3.45 P.M. on Friday, Oct. 29, at the Imperial College of Science and Technology, South Kensington, London, S.W.7. Mrs. A. M. Robinson, PH.D., and Mr. F. L. Warren, D.SC., will speak on Applications of Polarography in the Diagnosis and Treatment of Cancer, Mr. Tudor S. G. Jones, PH.D., on the Determination of Amino-acids by Polarographic Reduction of their Copper Complexes, and Mr. J. E. Page, PH.D., on the Polarography of Penicillin.

Liverpool Regional Hospital Board

At a meeting held on Oct. 7 the board approved an estimate of expenditure for 1949–50 of £7,160,280, of which £597,282 is to be spent on capital work at hospitals. No guidance has been received from the Ministry of Health as to the total expenditure on capital work to be allowed by the board, and it was agreed to acquaint the Ministry with the full needs of the region. The board estimated that works begun in 1949–50 would require a further expenditure of approximately £900,000 in the financial year 1950–51.

The board approved in principle the proposal to erect a first stage of a new mental-deficiency institution at Greaves Hall, Banks, near Southport, at a cost of £2,000,000.

Return to Practice

The Central Medical War Committee announces that Mr. Gilbert Parker, F.R.C.S.E., has resumed civilian practice at 25, The Crescent, Linthorpe, Middlesbrough.

Dr. A. C. Norman has been appointed to the third class (civil division) of the Order of Al Rafidain in recognition of his services as director of the X-ray institute at the Royal College of Medicine, Baghdad.

Major-General R. J. Blackham, M.D., on completion of 21 years' service as clerk of the Worshipful Company of Glaziers and Painters of Glass, has been unanimously elected an honorary member of the court of assistants of the company. The court and livery of the Glaziers Company also presented him with an antique clock and a cheque.

Appointments

CASE, R. A. M., M.B., PH.D. Birm.: fellow, Chester Beatty Insti for Cancer Research, London.

MACKENZIE, N. F., M.B. Edin., DIP. PSYCH.: superintendent, N church Home, Culcheth; adviser to the Liverpool Reg Hospital Board on mental deficiency problems and super of the board's smaller mental deficiency establishments.

RAVEN, R. W., O.B.E., F.R.C.S.: visiting surgeon, Star and Ga Home for Disabled Sailors, Soldiers, and Airmen.

Hospital for Sick Children, Great Ormond St., London:

BLACK, J. A., M.B. Camb., M.R.C.P.: asst. medical reg gastro-enteritis flying squad and hospital gastro-ente unit.

COWAN, R. J., M.D.: house-surgeon, orthopædic departm

DAVIES, PAMELA, M.B. Glasg.: asst. resident M.O., Tadw Court.

MACOUN, S. J. R., B.A., M.B. Camb., M.R.C.P.: house-physic

SAVAGE, T. R., M.A., B.M. Oxfd, M.R.C.P.: house-physician

London County Council Public Health Department:

Asst. divisional M.O.:

ATLEE, C. N., M.D. Durh., M.R.C.P., D.P.H.
BUTLER, LILY, M.R.C.S., D.P.H.
LOW, J. B., M.B. Edin., D.P.H.
POLHILL, M. C., M.R.C.S., D.P.H.
SIMPSON, R. H., M.D. Lond., F.R.C.P., D.T.M. & H., D.P.H.

Diary of the Week

OCT. 24 TO 30

Monday, 25th

SOCIETY OF APOTHECARIES, Black Friars Lane, E.C.4
4 P.M. Dr. Basil Parsons-Smith: Hypertension.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. Jack Rubie, Dr. Geoffrey Marshall: Streptom

Tuesday, 26th

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. A. D. Porter: Liver Function in Certain Dis of the Skin.
INSTITUTE OF LARYNGOLOGY & OTOLOGY, 330, Gray's Inn R W.C.1
2.30 P.M. Mr. W. A. Mill: Malignant Diseases and Radiothe
EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mr. Cecil Bin Legal and Social Implications of Artificial Insemina

Wednesday, 27th

SOCIETY OF APOTHECARIES
5 P.M. Prof. Henry Cohen: Therapy as a Diagnostic Me
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY
4.30 P.M. (1, Wimpole Street, W.1.) Dr. J. M. H. MacL Milestones on a Dermatological Journey. (Prosser W oration.)
MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Judge Earengey: Justice.
ROYAL INSTITUTE OF PUBLIC HEALTH & HYGIENE, 28, Port Place, W.1
3.30 P.M. Dr. C. Fraser Brockington: Problem Families.
UNIVERSITY OF GLASGOW
8 P.M. (Department of Ophthalmology.) *Prof. A. Loewenst* Histopathology of the Drainage Angle.

Thursday, 28th

SOCIETY OF APOTHECARIES
5 P.M. Sir Stanford Cade: Management of Inoperable Malig Disease.
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W
5 P.M. Prof. E. G. T. Liddell: *Integration—Then and Now*
LLOYD ROBERTS LECTURE
4.30 P.M. (St. Mary's Hospitals, Manchester.) Mr. R. M. Titm Parenthood and Social Change.
CHADWICK LECTURE
4 P.M. (University College, Nottingham.) Sir Arthur MacNa Advances in Preventive Medicine during the Wa 1939–45.
HONEYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh Royal Infirmary.) Dr. R. G. Gordon: Psy genic Pain.

Friday, 29th

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES
8 P.M. (11, Chandos Street, W.1.) Mr. Reynold Hord: V.D. Factor in Infertility and Sterility and its Treatm

Saturday, 30th

BIOCHEMICAL SOCIETY
11 A.M. (London School of Hygiene, Keppel Street, W.C Symposium on Partition Chromatography and its App tion to Biochemical Problems. (This notice was incorre included in last week's Diary.)

CORRIGENDUM: *Conference on Infertility.*—The subst used by Dr. Ernst Friedman in hysterosalpingography (Lan Oct. 2, p. 543) is 'Viskiosol 6,' made by Messrs. May & Bak Ltd.

MENINGOCOCCOSIS

A PROTEAN DISEASE*

H. STANLEY BANKS
M.D. Glasg., F.R.C.P., D.P.H.
CIAN-SUPERINTENDENT, PARK HOSPITAL, HITHER GREEN

(*Concluded from p. 640*)

Complications and Sequelæ

Not only the varieties of meningococcosis but also what usually termed its complications bear witness to the tean nature of this infection. Complications have considerably reduced both in number and scope chemotherapy. For example, pericarditis and neuro-ulitis, formerly not uncommon, were not observed y series of 706 cases. The most significant reduction, ever, is in hydrocephalus and the chronic form of disease. The three most common complications now labyrinthitis, arthritis, and cranial-nerve palsies, d, of these, only labyrinthitis leaves sequelæ. The manent deafness resulting from labyrinthitis is by the most important residuum among those who over from the disease.

LABYRINTHITIS

Labyrinthitis is due to infection of the perilymph rough its direct connexion with the subarachnoid ce. As a rule both vestibule and cochlea are affected. vestibular lesion produces a defect of balance which mains until it is compensated by re-education of pro-oceptive and visual mechanisms, usually after a few nths. The cochlear lesion affects the organ of Corti ally or partially, producing perception-deafness (nerve-afness). Unfortunately the damage is done at an rly stage of the disease, commonly on the second or d day; so the chances are against recovery from ess, even with prompt sulphonamide therapy. In perience the deafness is transient for a few days s in about 1 in 6 of all cases in which deafness is in the acute stage. In a minority of the remainder vement takes place for a few weeks, or rarely for months, after the onset. Permanent deafness in or both ears, total or partial, is the sad lot of all the transient cases, and most of them are in children young adults. In my series the risk of contracting ness appeared to be about 5–7% in all age-groups ept 15–30 years, at which age it was considerably er:

Age-group	*No. of cases*	*Deafness*
0–4	242	9 (3·7%) } (5·0%)
5–14	90	7 (7·7%) }
15–29	220	6 (2·7%)
30–44	88	7 (7·9%)
45–59	46	3 (6·5%)
60 and over	20	1 (5·0%)
Totals	706	33 (4·7%)

The deafness affects the higher pitched tones, including whole range of human speech. Low tones and rations may be perceived but not clearly distinguished. nitus occasionally accompanies the deafness but is usually troublesome. The incidence of deafness has en been estimated at about 2% at the time of discharge om hospital (Harries 1942, Joe 1942, Beeson and terman 1943). This is an underestimate for the llowing reasons: (1) deafness in infant patients may t be detected until the second year of life; and) unilateral deafness may not be detected until some e after the patient's discharge from hospital, unless ch ear of every patient is carefully tested separately fore discharge from hospital. In a follow-up of 1075 cases in the London region Maddock (1943) reported 37 cases (3·4%) of partial or total deafness, and in a similar follow-up in South Wales the figure was 5·5% (Degen 1945). In my series 29 cases of deafness were detected in hospital and 4 cases after discharge, a total incidence of partial, total, unilateral, or bilateral permanent deafness of 4·7%. About half of these cases had total bilateral deafness:

Type of deafness		*No. of cases*
Transient		7 (1·0%)
Permanent:		
Unilateral	partial	6 (0·8%)
,,	complete	5 (0·7%)
Bilateral	partial	6 (0·8%)
,,	complete	16 (2·3%)
Total permanent		33 (4·7%)

ARTHRITIS, BURSITIS, AND TENOSYNOVITIS

There were 33 cases (4·7%) of joint complications in the series. The joints affected were the shoulder, elbow, wrist, small joints of hand, and knee. Occasionally bursæ in the neighbourhood of joints and tendons at the back of the wrists were affected. The synovial fluid was often turbid, but meningococci could not be grown from it owing to efficient chemotherapy. Resolution was nearly always complete in a few weeks, but occasionally knee, elbow, and shoulder arthritis persisted for some months.

CRANIAL-NERVE PARALYSIS

Lower-motor-neurone Type.—Most commonly this paralysis involved the sixth nerve, then the seventh, third, and fourth in that order. It is probably due to pressure of meningeal exudate on the nerves as they emerge from the brain stem. The duration of paralysis varies from a few days to about four months, the average being two to three weeks, and it always clears completely. In the series there were 16 cases of unilateral and 4 of bilateral external-rectus, 11 of facial, 4 of oculomotor, and 1 of superior-oblique paralysis, a total incidence of 5·2% of lower-motor-neurone cranial-nerve palsies.

Upper-motor-neurone Type.—Cranial nerve paresis of this type is occasionally seen in encephalitic cases. It is usually much more transient than the lower-motor-neurone types. In the present series there were 5 such cases of facial paresis, and there were also one or two cases of transient ptosis of doubtful origin.

NEURITIS OR RADICULITIS

Pressure of exudate on spinal nerve-roots occasionally gives rise to flaccid paralysis of single muscles or muscle groups, but no example of this occurred in the series. It has to be distinguished from sciatic palsy due to the injection, through ignorance or error, of irritating material—e.g., sodium sulphapyridine—into the theca. In the early days of sulphonamide therapy this mistake occasionally caused permanent foot-drop.

HEMIPLEGIA, SPASTIC PARALYSIS, AND JACKSONIAN CONVULSIONS

These are usually due to pressure on the cerebral cortex in the early acute stage when purulent exudate is at its maximum, but they may be due to encephalitic lesions. Since efficient chemotherapy has been used they have become relatively rare and usually transient. In the present series there were 10 cases, including 3 of hemiplegia, among 654 recovered cases. In 1 exceptional case which was fatal, hemiplegia was due to focal hæmorrhage in the internal capsule.

THROMBOSIS OF SUPERIOR LONGITUDINAL SINUS

This is a rare and unexpected catastrophe; 1 case occurred in my experience.

The Milroy lectures to the Royal College of Physicians for 1945. Deferred because of the author's service overseas.

not making sufficient effort or were becoming neurotic. When the thyroid gland was exposed at operation, it was found that, though the gland was small, high upper poles were lying behind the larynx and pharynx. Their appearance was similar to that of a retrotracheal nodule as already described.

(4) *Pronounced Exophthalmos* (approaching the malignant type).—This is usually found in people over 35 years of age and is accompanied by œdema of the eyelids. We have given a few of these cases serious trials of thiouracil, but none improved and, as the B.M.R. became less, the exophthalmos increased. In the type of exophthalmos seen in patients under the age of 30 years with Graves's disease the protrusion of the eye subsides equally with the subsidence of the toxic symptoms, whether treated by thiouracil or by surgery.

(5) *Predominance of Heart Symptoms* (e.g., tachycardia and fibrillation).—These are the last symptoms to improve on thio compounds—it may take months, as opposed to the quick results of surgery.

(6) *Depression due to Thyrotoxicosis.*—The thio compounds, like the sulphonamides, are inclined to cause depression in some patients.

(7) *Absence of Facilities for Blood-counts, &c.*—If patients have to come in to a centre where there are such facilities, then the economic question is to be considered, since they have to give up work for a much longer time than has the average surgical case.

We have seen one patient die as a result of thiouracil. She was a woman of 50 sent into the hospital from a country district as an acute cholecystitis. A blood-count showed a complete absence of white cells. It was then discovered that she had been treated for two months with thiouracil for thyrotoxicosis. In spite of all treatment, including parenteral penicillin, she died in three or four days.

INDICATIONS FOR TREATMENT WITH THIOURACIL

The following are indications for the use of thiouracil:

(1) *Young People with Graves's Disease.*—At this age nodulation is only just beginning; therefore difficulties arising from increase in size of the thyroid gland are not common, except in those with high retrolaryngeal upper poles.

(2) *Predominance of Nervous Symptoms except Depression.*—There is no doubt that a quicker improvement of the nervous flushes and excitement takes place with thiouracil compounds than with iodine.

(3) *Elderly people who are grave surgical risks.*

(4) *Recurrent Thyrotoxicosis after Operation.*—These cases often respond quickly to 0·2–0·3 g. of thiouracil daily, but we have had several failures because the swelling of the thyroid remnant has been increased by the administration of thiouracil and caused a choking feeling. (In our method of thyroidectomy a small piece of the posterior part of the thyroid gland is left lying closely along each side of the posterolateral aspect of the trachea.)

Preparation for Operation.—Severe thyrotoxicosis may be benefited by preoperative treatment with thiouracil. As a rough guide it is said that one day of treatment will be needed for each percentage of elevation in the B.M.R. This means that a patient with a B.M.R. of 90% would take 90 days of preparatory treatment and, at the end of that time, would have to have two weeks' treatment with iodine to make the operation less difficult. There is no doubt that a thiouracil-prepared case is more difficult than one which has not been so prepared. The use of iodine makes the gland less vascular and firmer and so easier to operate on. Altogether this subjects the patient to a long period of preparation.

Personally, I can see no advantage over the old iodine preparation, combined with rest and sedatives, which will enable a patient with a B.M.R. of 100% to be ready for operation in 10 days or so.

Two years ago, reporting on the result of treatment of 45 cases with thiouracil, I was able to say that 50% had done well.[1] Since that date 6 of these have relapsed and 3 have been operated on; hence the percentage of recovery of these original cases is now only 35%.

It seems that thiouracil treatment should be continue for a year or even two. All this time the thyroid glan is kept in a state of cellular activity, as shown histological sections. In spite of this activity the thyro gland cannot manufacture its normal hormone; ar this may have harmful results, for Purvis and Guisbach have produced adenocarcinoma of the thyroid gland rats by continued administration of thiourea for t years.

TREATMENT BY SURGERY

Nearly all the failures in all groups were submitt to surgery, making with those operated on without tr of thiouracil over 250 cases. Of the patients und 21 years of age 16 were operated on and only 14 d well. The other 2 were not good results and we given a postoperative course of thiouracil. On this th improved a good deal but are not entirely satisfacto yet. In the age-group 21–45 all the patients operat on did well. Of those aged over 45 all did well exce a woman, aged 70, who had been treated with thioura for over a year.

She had made great improvement, regarded herself cured, and stopped taking the drug. I was asked to her again nine months later. The nodules in the neck h become hard and firm, and she again had thyrotoxico Chiefly because of the hardness of the gland, which suggest a malignant change, operation was advised. She died fr abdominal distension the day after operation. The sectio from this gland were not malignant but showed so thyroiditis.

This was the only death in the series, making t surgical mortality well under $^1/_2$%.

SUMMARY

Of 350 patients with thyrotoxicosis 111 were treat with thiouracil: of those aged under 21 years 10 o of 16 (62%) were improved; of those aged 21–45 yea 29 out of 73 (40%) were improved; and of those ag over 45 years (all with nodular goitre) 11 out of 22 (50 were improved.

Contra-indications to the use of thiouracil are sig of pressure on the airway, toxic nodular goitre, a retr laryngeal upper pole of the thyroid gland, pronounce exophthalmos, predominance of heart symptoms, depre sion due to thyrotoxicosis, and the absence of facilit for blood-counts, &c.

Indications for the use of thiouracil are the youth the patient, predominance of nervous symptoms oth than depression, elderly patients who are grave surgic risks, recurrent thyrotoxicosis after operation, and seve thyrotoxicosis requiring preparation for operation.

Over 250 patients with thyrotoxicosis, including near all those who did not respond sufficiently to thiourac were operated on: of those aged under 21 years 14 ou of 16 did well; of those aged 21–45 years all did wel and of those aged over 45 years all did well except o who died (the only death in the series).

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[1] Robertson, C. *N.Z. med. J.* 1946, **45**, 216.

[2] Purvis, H. D., Guisbach, W. E. *Brit. J. exp. Path.* 1947, 28, 4

"... The whole world is in a state of unrest: countrie peoples, nations, institutions, are being swept by viole winds; heavy gales are blowing everywhere.... Previous the roots of our being remained steady in the depths ev though the boughs swayed and tossed above. Now we beg to feel that fear-making loosening of roots. It is not to much to say that every institution, every individual is no faced with the challenge 'Look to your roots.' It is then that we will find a new wisdom in the original necessity ou of which our institutions and tradition grow. Problems o Good and Evil, God and Devil could in the days of ou fathers be dealt with in traditional ways, often by traditiona admonitions. Now this does not suffice, and we find it imperative to look into things previously avoided as unwholesome, or even unclean. 'Get thee behind me, Satan'—meaning 'Get you back into the unconscious'—is no longe effective."—Dr. C. M. BARKER, in lecture no. 50 of the Guild of Pastoral Psychology.

ants passed through the intermediate stage known as terior basal meningitis, in which the exudate, after acute stage, collects at the base of the brain and becomes organised. with the formation of adhesions subarachnoid block.

adults, under the same conditions of missed diag- and delayed treatment, hydrocephalus may p, with chronic headache as a symptom. Later, in es, there is a tendency for exudate to collect in the ent dorsal region of the cord, with the formation hesions, pressure on nerve-roots, and possibly plegia. In such a condition a spinal tap may be dry ld a small quantity of xanthochromic cerebrospinal (C.S.F.) of very high protein content—e.g., 1 g. per ml. (Froin's syndrome of spinal block). In my series were 10 (1·4%) cases of hydrocephalus or severe chnoiditis. Of these, 6 were in infants and 4 in adults. n admitted to hospital these patients were all in second or third week of the disease, the diagnosis ing been missed in the early acute stage. Of the ants 3 died, 1 developed chronic hydrocephalus, and ade a perfect recovery. Of the 4 adults 2 died d 2 recovered completely.

Delayed arachnoid clearing without adhesions and hout symptoms—e.g., where the C.S.F. shows a cytosis of 10–30 cells per c.mm. some weeks after acute stage—is of little significance. It normally ompanies resolution in some cases and should be regarded.

RARE COMPLICATIONS

Orchitis and epididymitis are now very rare. I have not n a case. Other rarities are *salpingitis, jaundice,* and *lytic ileus*; 1 case of jaundice and 1 of paralytic s occurred in my series. *Otitis media* is due to dary infection and is rare.

RELAPSES AND RECURRENCES

pse or recrudescence occurring within a few weeks the primary attack was formerly common. With sulphonamide treatment it is now uncommon; occurred in the series.

nd Attacks.—Immunity does not seem to be solid permanent in meningococcal disease; 4 second cks were noted in the series, one, two, three and ty-five years after the first attack.

SEQUELÆ

By far the most common permanent sequela of organic in is deafness. Others include hydrocephalus, blind-, and paralyses of various kinds. The group of called psychiatric sequelæ were intensively studied the late war. They are partly of organic origin but be intensified and fixed by wrong psychiatric hand-, especially in war-time when escape from military vice becomes a strong subconscious motive. The most mon symptom is persistent headache. As a rule this intermittent, lasting a day or two, and followed by mal intervals of a few weeks; the attacks may r for as long as eighteen months. The headache may aggravated by exposure to sunlight or by stooping. gradually clears unless perpetuated by emotional . It may be associated with failure of concentration. kache, insomnia, depression, postural dizziness, ctional ocular symptoms, muscular limb pains, effort mptoms, poor memory, dreams, dyspepsia and vertigo. some cases there is a change in personality from eableness to chronic irritability.

"Many of these symptoms are frankly hysterical in ture, and they are strikingly correlated with predisposition to psychoneurosis, as determined by psychiatric study of the personality. They are only partially correlated with the severity of the acute illness" (Ballard and Miller 1945).

My experience is in agreement with this judgment. These sequelæ are nearly all temporary and disappear within a year or two. Maddock (1943) and Degen (1945) each reported on the after-histories of about 1000 patients discharged from hospital during the war. These patients were visited by nurses, and the symptoms complained of were recorded. In Maddock's series 51 patients recorded as having complaints were ex-patients of the Park Hospital. These were requested to attend for medical examination, and 34 of them did so from some nine months to two and a half years after discharge from the hospital. Of the 34, no sequelæ could at that time be detected in 16, and in a further 7 cases the sequelæ reported were due to causes unconnected with the meningitis. In 2 cases the complaints were "backache" and "weakness of ankle" and appeared to be clearing. Of the remaining 9 cases 8 were deafness and 1 loss of an eye—all certainly due to the meningitis. This small experience fits in with other observations that, within a year or two of the attack of the disease, functional sequelæ have nearly all cleared, and that in well-treated cases there is little residual disability except deafness. However, it was found in both world wars that suggestion by doctors and others plays a significant part in the production and perpetuation of the psychiatric group of sequelæ, and that admission to hospital must for this reason be avoided.

The principal complications in my 706 cases were as follows:

Complication	*No. of cases*
Deafness	33 (*4·6%*)
Arthritis, bursitis, tenosynovitis	33 (*4·6%*)
Lower-motor-neurone paresis:	
III nerve	4 (*0·6%*)
IV ,,	1 (*0·2%*)
VI ,,	20 (*2·5%*)
VII ,,	11 (*1·5%*)
Upper-motor-neurone paresis: VII nerve	5 (*0·7%*)
Spastic paralysis, jacksonian convulsions	7 (*1·0%*)
Hemiplegia	3 (*0·4%*)
Thrombosis of superior longitudinal sinus	1 (*0·2%*)
Iridochoroiditis	2 (*0·3%*)
Panophthalmitis	1 (*0·2%*)
Auricular fibrillation	3 (*0·4%*)
Glycosuria (non-diabetic)	5 (*0·7%*)
Bronchopneumonia	4 (*0·6%*)
Empyema	1 (*0·2%*)
Hydrocephalus, arachnoiditis	10 (*1·4%*)
Herpes febrilis (extensive)	10 (*1·4%*)
Relapse	3 (*0·4%*)
Second attacks	4 (*0·6%*)

Treatment of Ordinary Form

CHEMOTHERAPY

In the ordinary form of the disease the infection is best combated with sulphonamides alone. Penicillin is not required either systemically or intrathecally. Several controlled series have shown that penicillin is inferior to sulphonamides in the treatment of the ordinary form (*Lancet* 1947). The best drugs in my experience are sulphathiazole and sulphadiazine. Some have claimed that sulphanilamide is equally good. I had extensive experience with this drug in 1937 and 1938 and learnt that low dosage with sulphanilamide is much more dangerous than it is with the newer drugs. I have never seen drug-resistant meningococci except where sulphanilamide was used. Moreover, this drug often causes cyanosis and mental confusion. Sulphanilamide should be used when renal blockage is feared (its acetyl derivative is much more soluble in urine than that of other sulphonamides) and either it or 'Sulphamezathine' in congestive heart-failure when adequate fluids cannot be given. A theoretical objection to sulphathiazole, still held in some quarters, is its low concentration in the C.S.F.—15–40% of the blood-level. Many cases in my series, treated with rapid and complete success, had only about 1 mg. per

A girl, aged 4 years, was admitted with a moderate attack of the ordinary form; group-II meningococci were cultivated from the spinal fluid; forty-eight hours after admission, when she seemed much improved and the spinal fluid was sterile, she had a sudden attack of vomiting and restlessness; rapid respirations and coma developed, and she died two days later.

At necropsy there was a clearing meningitis, thrombosis of the superior longitudinal sinus, and hæmorrhage into the left frontal lobe. The source of the thrombosis was presumed to be the meningococcal vascular lesion.

OPHTHALMIA

Hyperæmia of the conjunctiva with photophobia often accompanies meningococcal meningitis.

Purulent conjunctivitis may occur as a presenting symptom of meningococcal disease in otherwise healthy subjects or as a complication.

Iridochoroiditis is a more frequent complication. It was noted in 7 cases (1%) in the series. In a woman of middle age the condition progressed rapidly to panophthalmitis, with loss of the eye. In another case pus was observed for two or three days in the anterior chamber, but complete recovery ensued. In 2 young children with iridochoroiditis in the early acute stage of the disease the media were semi-opaque, with 100% loss of light reflex. These 3 cases cleared completely under sulphathiazole treatment.

Blindness may result from (1) iridochoroiditis developing to panophthalmitis, (2) acute optic atrophy apparently associated with pressure of meningeal exudate at the optic chiasma, (3) the optic atrophy of chronic hydrocephalus, or (4) a central lesion in the occipital lobe. All forms are now rare. The incidence of permanent blindness in Beeson and Westerman's (1943) analysis of 3575 case-records was 0·11% and in my series 0·14%.

RETENTION OF URINE

This often presents a considerable problem, especially in men. Restlessness and a tendency to get out of bed may be partly due to a subconscious desire to urinate. Retention of urine soon leads to symptoms of uræmia. The blood-urea should be frequently tested until urine is passed freely. Uræmic coma may tip the scale against the survival of elderly patients. An indwelling catheter is a good precaution against uræmia in difficult cases.

DEHYDRATION

This tends to occur in children and delirious patients owing to the difficulty in giving fluids. Vomiting increases the tendency, and this was a particular danger when sulphapyridine was used in treatment.

CARDIAC COMPLICATIONS

Toxic myocardium is always present in some degree in the acute stage. It was particularly evident as a direct effect of the toxæmia in 4 cases (0·6%) of my series. These were in young people aged 2, 6, 16, and 24 years. They all showed evidence of cardiac dilatation. In 3 cases the auricles were fibrillating for two or three days, and in 1 patient aged 6 years a well-marked *bruit de galop* persisted for three days. All 3 cases rapidly recovered after the infection had been overcome by chemotherapy. In elderly people with myocardial degeneration the toxic effect of the acute disease on the myocardium is less readily assessed.

Pericarditis should be carefully looked for; it may be found unexpectedly at necropsy. *Endocarditis* is rare.

GLYCOSURIA

Pressure of exudate on the floor of the fourth ventricle may occasionally cause glycosuria, which may be associated with severe acetonuria and even coma and has then to be distinguished from concurrent true diabetic coma. In diabetic coma a history of diabe and the presence of dehydration, low ocular tension, blood-pressure, high blood-sugar and well-marked ket uria are significant points. In my series 5 cases glycosuria and 1 of concurrent diabetic coma were not

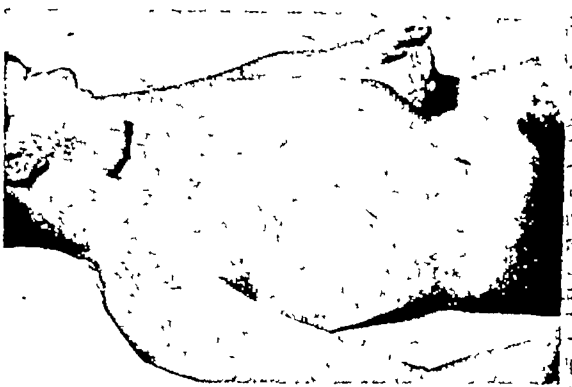

Fig. 11—Extensive herpes febrilis on face, left thumb, and left [illegible] groin, probably spread by contact.

HERPES FEBRILIS

This is a frequent accompaniment, usually from t fourth or fifth day of the disease; it is usually confin to the labial region but is occasionally more extensi It may involve the face, palate, hand, arm, neck, a even parts of the trunk and lower limbs. This extens herpes is sometimes regarded as herpes zoster, but it very exceptional for it to correspond exactly to distribution of a particular nerve. Rolleston (19 referred to it as herpes of zoster type. It is unlikely t the chickenpox virus, which is the usual cause of her zoster, would often accompany meningococcal dise whereas the virus of herpes febrilis is well known to associated with meningococcal, pneumococcal, and respiratory infections. Of 10 cases of extensive her observed in my series the sites affected were all with easy reach of the patient's hands. In 2 cases the patient thumbs were affected besides the face and trunk or In no case did the area covered by the lesions corresp exactly to the distribution of a cutaneous nerve or nerv When herpes in this disease extends beyond the lab region it may have been spread to the new site by t patient's hands (fig. 11). In one of my cases, a vi of herpes febrilis type was isolated from the vesicul fluid by Dr. F. O. McCallum.

ULCERS OF SKIN AND SUBCUTANEOUS TISSUE

These occasionally result from the breaking down *massive purpuric lesions* owing to the growth of mening cocci within those lesions. If such lesions beco secondarily infected, considerable scarring, even of keloid nature, may result.

RESPIRATORY COMPLICATIONS

Bronchopneumonia is a not uncommon associat condition, especially in infants. The combination is ve serious. Some cases are meningococcal in origin, b most are probably due to a secondary pneumococ or hæmolytic streptococcal infection. Several of m cases of concurrent pneumonia and meningitis were infants aged 2 or 3 months, who appeared to be save by the combined use of chemotherapy and the oxyg tent.

Pleurisy is very rare. *Empyema* was found in 1 case.

HYDROCEPHALUS AND ARACHNOIDITIS

These result from subarachnoidal adhesions due t insufficient or delayed therapy in the acute stag Formerly this was relatively common in infants. Suc wing case, however, only temporary improvement obtained.

A woman of 31 was admitted on the fifteenth day of disease a fortnight's history of intermittent headache, backache, ting, and slight stiffness of the neck, during most of time she had been ambulant. The relatively mild ptoms had misled the doctor in attendance, and the nosis of meningitis was overlooked.

On admission she was conscious and rational, with pyrexia, neck, slight upper-neurone left facial paresis, unequal s, transient diplopia, right knee-jerk diminished, fundi mal, C.S.F. scanty, xanthochromic, cells 309 per c.mm. nonuclears 76%), chlorides 590, *protein* 1150 *mg. per ml.* Colloidal gold early mid-zone curve; Wassermann tion weak positive (negative in blood); a few meningo-ci seen in films but none cultured. Complement-fixation for meningococcal infection positive (Dr. R. Cruickshank) te-cell count 14,600 per.c.mm. (polymorphs 84%).

Treatment.—Sulphathiazole 9 g. daily, gradually reduced 4 g. daily, for eight days.

Course.—Patient improved gradually but had severe chronic dache in left frontal region for many weeks, with vomiting times. Lumbar puncture on several occasions produced y a few ml. of xanthochromic and highly proteinous sterile id., and after three months no fluid. Cisternal puncture a dry tap on two occasions. Ventricular puncture after months gave a clear fluid from each ventricle at normal ssure, but this did not relieve headache at once. Headache ntaneously cleared, however, seven days after the second tricular puncture, three and a half months after admission. ee weeks later, spastic paraplegia with some sensation s in right leg. Six weeks later, spastic paraplegia in both s, feeling of a band round waist, tickle sensation in this n lost, pinprick and vibration sense lost in both limbs. gnosed as compression paraplegia from D5 to D12.

Operation (Mr. Dickson Wright).—Cisternal puncture having this time yielded fluid, laminectomy from D3 to D12 was ne, and adhesions were freed. As a result patient could ve her legs, but recovery was incomplete. Cisternal Lipiodol’ now revealed lower limit of fluid to be C2 vertebra. injection of lipiodol, left frontal headache and vomiting red, and many ventricular punctures revealed a return of hydrocephalus and did not relieve it.

d Operation.—Foramen of Majendie found completely with thin diaphonous adhesions; double hydro- Foramen was cleared. Four days after the second tion patient died of œdema of medulla. Though the logical signs pointed to obstruction at about D5, there e dense adhesions from C2 to D12, as well as in the terior fossa at the foramen of Majendie.

PROPHYLAXIS

Meningococcal infection is endemic in most countries. never dies out completely but persists to a variable tent in the nasopharynx of carriers, and in abortive, ld, and other cases at all times. It cannot therefore eliminated by the isolation of clinical cases. Never-theless, with few exceptions, patients with clinical ningococcosis should be removed to hospital for con-mation of diagnosis and effective treatment. Prophy-xis among large bodies of colonial troops by injection meningococcal vaccines was tried in presulphonamide ys without convincing success, and a skin test for munity was also in the experimental stage. These asures have been superseded by mass prophylaxis ith sulphonamides.

Carriers.—The complexity of the carrier state was monstrated by investigations in the great semi-isolated U.S.A. military camps during the war. Phair et al. (1944) howed, in one infected camp, that when swabs from 100 oldiers were cultured on multiple plates at intervals during ten weeks, 91% were found positive at one time r another, more than half of them harbouring two or more specific strains. It is now clear that the carrier-rate of a group cannot be adequately determined by single cultures, and that the carrier state of a group is a complex ever changing pattern. It is therefore a vain endeavour to attempt to isolate carriers.

Mass prophylaxis by administration of sulphonamide simultaneously to all members of an infected semi-isolated group does eliminate carriers as well as clinical cases to a very large extent. This method has been used with success to break an epidemic in such semi-closed communities as (1) a children's residential home (Meehan and Merrilees 1940); (2) large military camps (Painton 1944); and even (3) a city of 100,000 inhabitants set in mountainous surroundings. There is evidence that a single dose of sulphadiazine 2 g. (or its equivalent) given simultaneously to every member of the selected community will achieve this purpose (Phair et al. 1944). The carrier-rate is reduced to a very low figure—e.g., 5–10%—for three weeks or more and then gradually rises, but by the time it does so the occurrence of clinical cases has stopped. This method has little application, however, to the infected individual household of an ordinary civilian community, since its members, unless isolated from the rest of the community, would quickly become reinfected.

Quarantine of contacts is useless and an unnecessary waste of time. Prophylactic sprays and douches are also useless and may be harmful. Fomites, unless very recently contaminated, do not convey the infection.

The convalescent patient now rarely harbours meningococci, since the sulphonamide treatment destroys them. The practice of swabbing his nasopharynx before release from hospital has been generally discontinued as not worth while.

The routine use of masks by attendants on patients in the acute stage is generally impracticable and is unnecessary, since direct infection is extremely rare. Their occasional use for a short time is advisable when an attendant is exposed to gross infection—e.g., in struggling with a delirious patient.

It is a great pleasure to acknowledge the valuable assistance I have received from many past and present members of the medical and nursing staff of Park Hospital, and of the medical and technical staff of the Southern Group Laboratory.

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100 ml. of free sulphathiazole in the C.S.F. during the first three days of treatment and about half this concentration thereafter. Such low concentrations were never ineffective, provided the patient was not moribund or beyond the reach of drugs.

The scale of dosage used throughout the series was that recommended by the Medical Research Council (1943) which is now standard practice in most British hospitals. Important points are that the dosage for infants of any age over 2 months during the first three or four days of treatment should never be less than 3 g. daily, and for adults 9 g. daily. It is well to begin with a "loading" intravenous dose in all severe cases. The best drug for intravenous or intramuscular injection is 'Soluthiazole' (M. & B.), which is nearly neutral (about pH7) but not quite isotonic. It is unirritating and has completely superseded the highly alkaline sodium salts. Sulphathiazole or sulphadiazine by mouth should always be given in an alkaline mixture containing the equivalent of gr. 20 each of sodium citrate and sodium bicarbonate to keep the urine alkaline, and at least 5 pints of fluids for an adult should be given daily.

OTHER TREATMENT

Spinal drainage, other than that obtained by the first lumbar puncture, is rarely necessary. The C.S.F. is nearly always sterile twelve to forty-eight hours after efficient sulphonamide therapy has been begun, and, with the infection overcome, the pressure rapidly becomes normal.

Sedation.—It is well to avoid morphine even in violent delirium since, among other undesirable effects, it increases the tendency to retention of urine and so to the deposition of crystals in the renal tubules and pelvis. 'Sodium amytal' gr. 3 combined with paraldehyde min. 120 is a good sedative hypnotic. Paraldehyde alone is seldom effective, unless as much as 6 drachms is given to an adult. A useful barbiturate sedative-hypnotic is 'Somnifaine' (Roche), of which repeated doses of 2 ml. may be given intramuscularly or by mouth.

Restraint.—A bed with cot sides is most useful for delirious patients. Restlessness and getting out of bed by unconscious patients is often due to a desire to urinate. This should be anticipated.

Urinary Tract.—If there is retention of urine, the catheter should be used before the bladder is greatly overdistended. If retention persists, a self-retaining catheter should be passed, or an ordinary one tied in for a few days. The chemotherapy will usually control catheter infection, provided reasonable aseptic precautions are taken. Hæmaturia or oliguria is rare when sulphonamides are given with alkali; but, if they appear, the drug must be promptly changed or stopped, and warmth or diathermy applied to the loins. Fluids must be pushed, unless there is threatened anuria, which should be promptly treated by ureteric catheterisation and wash-out.

Glycosuria may be ignored, unless it is due to diabetes, when the insulin intake must be regulated.

Concurrent pneumonia is not uncommon in infants and is very serious. The oxygen tent is very helpful in such cases.

Special Syndromes

FULMINATING SEPTICÆMIA OF ADRENAL AND MIXED TYPES

This is a medical emergency requiring immediate multiple measures.

(*a*) Combat the infection with sulphathiazole or sulphadiazine combined with systemic penicillin in high dosage.

(*b*) Combat shock by adrenal replacement therapy, especially adrenal cortical extract—e.g., 'Eucortone' 5 ml. intramuscularly or more every four hours; plasma intravenously seems also to be indicated in the present state of our knowledge.

(*c*) Combat anoxæmia with oxygen, especially the oxyg tent for a child.

(*d*) Combat any special complications—e.g., hyperg cæmia, with insulin, dehydration with salines, &c.

Combating the infection is the most important measu Both adrenal replacement and plasma for shock syn toms should at present be used, though the exact va of each cannot easily be assessed.

It is of the utmost importance to establish the diagn of the syndrome early by careful examination, includ blood-pressure readings, and then to initiate full tre ment without delay. A fair proportion of lives can saved, at least in the pure adrenal type. In the mi type the same measures are applicable, but, in additi 20 ml. or more of 50% glucose may be injected int venously in an attempt to relieve the œdema of brain and the intracranial pressure.

FULMINATING SEPTICÆMIA OF ENCEPHALITIC TYPE

(*a*) Combat the infection with intravenous and in muscular soluthiazole and penicillin.

(*b*) Feed the patient by nasal tube.

(*c*) Combat dehydration with parenteral or rectal saline

(*d*) Combat the œdema of the brain with intrave hypertonic glucose.

ACUTE DIFFUSE ENCEPHALITIC SYNDROME

(*a*) Combat the infection with intravenous and in muscular soluthiazole and penicillin until consciousnes restored, and thereafter with sulphonamides by mouth.

(*b*) Feed the patient by nasal tube.

(*c*) Correct dehydration.

(*d*) Give 20 ml. of 50% glucose intravenously to re œdema of the brain, and repeat as necessary.

This last measure is sometimes dramatically succes in this syndrome, but sometimes it appears to h no effect.

A man of 62, after thirty-six hours' deep coma, beca conscious within a few minutes of the injection of the hyp tonic glucose. The lucid interval lasted only 5 min., which he relapsed into deep coma within the next half-h Repetition of the dose next morning had a similar dram effect, but this time he remained conscious and slo recovered.

CHRONIC FORM

Hydrocephalus.—Ventricular drainage by punct should be tried, but it is rarely successful in re-establish the flow of C.S.F. In infants and young children hyd cephalus sometimes clears spontaneously after so months, even when temporary blindness seems to h been present. If the condition has not cleared in months and the head is enlarging, neurosurgery m possibly be able to re-establish drainage, not with considerable operative risk. In one of my cases anterior wall of the third ventricle was removed provide an outlet for the retained fluid to flow over surface of the brain in the subdural space. No perman benefit, however, resulted from this operation. I indebted to Mr. Dickson Wright for information Hyndman's operation (ventriculocisternostomy) whi appears to be promising. A communication can be ma from ventricle to subarachnoid space by disrupting pia-arachnoid and ependyma of the choroid plex This provides an effective means of shunting the circul tion of the fluid from the ventricle through the su arachnoid spaces of the tela choroidea to the basal cistern which, fortunately, are rarely obliterated by the chron inflammatory process (Hyndman 1946).

Paraplegia.—Where there is compression paraplegia neurosurgeons have had a few successes with an extensi laminectomy and freeing of the adhesions. In th

DISCUSSION

It is therefore clear, nor is it surprising, that organisms can readily grow through a dressing steeped in plasma or broth, and it seems a safe assumption that the same will happen if the nutrient fluid is the normal exudate from a burned surface, since small inocula of these same organisms—hæmolytic streptococcus, staphylococcus, Proteus, and *Ps. pyocyanea*—have been found to grow freely in such exudate (blister fluid).

How often such an ingrowth of organisms does in fact occur through dressings soaked in vivo with serous exudate or blood we do not know. It will always be difficult to prove. It probably happened in the case of A.B., and it may well have been responsible for a number of other added infections by *Ps. pyocyanea* which developed between the first and second dressings of such burns (the period of maximal exudation) during the latter part of 1947 (Colebrook et al. 1948). It may also have been responsible for many of the early infections of burns by hæmolytic streptococci reported by Cruickshank (1935) from the burns wards of the Glasgow Royal Infirmary and noted by Stuart in the same wards during 1941 (see Colebrook et al. 1945). In a ward with many other infections by that organism (from which it may be disseminated by the air) the passage of hæmolytic streptococci through intact but soaked dressings would be particularly liable to occur because of the readiness with which it can multiply in fresh wound exudate from the smallest implant (Wright 1915, Wright et al. 1918).

Quite apart from burns, the tendency for dressings to become soaked after operations is well known to surgeons and ward sisters. The possibility of growth of organisms through such dressings should always be borne in mind. The best way to prevent it is not yet clear. Insertion of a thin plastic sheet under the outer bandage should be effective in many cases, but the use of some of these materials has certain disadvantages. Cellophane, for instance, is difficult to apply because of its inelasticity and its liability to tear; the bandages over it also tend to slip on the smooth surface. Other plastic films with better mechanical properties, such as polythene, are impervious to water vapour as well as to water; and, if the dressing is completely enclosed by them and is bandaged firmly to the skin all round, the underlying wound becomes sodden and healing may be retarded. The ideal material, besides being flexible and strong, would be pervious to water vapour but not to liquids or to bacteria. Such a material (a derivative of 'Nylon') has already been produced in small quantities, and some experimental results obtained with it have been described by Bull et al. (1948). It is hoped that larger quantities of this plastic will soon be available for more extended trials.

SUMMARY

The possibility that wound pathogens can readily "grow through" an intact dressing when this becomes soaked with exudates has been investigated.

A model wound was constructed and covered with the usual gauze, wool, and bandages. After repeated instillation of sterile serous fluid into the wound till the outer bandage was just moist, *Ps. pyocyanea* or other wound pathogens were brought into contact with the outer bandage and the whole was incubated. Motile organisms such as *Ps. pyocyanea* and *Proteus* invariably passed through to the "wound" within a few hours; hæmolytic streptococci and staphylococci passed through a little more slowly.

It is suggested that some of the hospital cross-infections of burns and scalds (which frequently weep copiously during the first few days), and probably also of other open wounds whose dressings become soaked, may arise in this way.

A sheet of cellophane inserted in the dressing prevents the ingrowth of organisms, but is not the ideal barrier. A flexible and strong plastic film which is pervious to water vapour but impervious to bacteria is under trial.

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A METHOD OF TESTING ANALGESICS IN MAN

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THE usual methods of testing analgesics are based on measurements of the threshold intensity of some stimulus required to elicit pain; but analgesics are mostly used to relieve existing pain. Since the presence of pain may greatly reduce the threshold-raising action of such drugs (Hardy et al. 1940), measurements of thresholds may not correlate with the ability of a drug to relieve pain associated with disease. Further, such drugs might act differently on superficial pain (produced in most threshold studies) than in deep pain.

We have tested the power of analgesics to relieve pain experimentally induced by the contraction of ischæmic muscles. Harrison and Bigelow (1943) noted the effects of analgesics on the number of ischæmic muscular contractions required to produce pain, but we have tested the effectiveness of these drugs in the relief of existent pain of ischæmic origin. Our method (Hewer and Keele 1947) therefore lies somewhere between the usual threshold studies and clinical observations on the effectiveness of analgesics. It is illustrated by tests on different groups of analgesics.

Four normal persons were the subjects of our experiments: two medical students (R. M. L. D., aged 20, and J. W. M., aged 19) and ourselves (aged 27 and 41). The tests were usually performed in the late afternoon, with the subject lying quietly on a couch.

PRODUCTION OF ISCHÆMIC MUSCLE PAIN

After a preliminary rest of 5–10 min. a sphygmomanometer cuff was applied to the upper arm and inflated rapidly to 220–230 mm. Hg to cut off the circulation to the arm distal to the cuff. The hand and forearm muscles were next exercised by rhythmically compressing a disconnected sphygmomanometer bulb (to provide a constant resistance against each contraction). After 30–45 such contractions an aching pain usually developed in the flexor muscles in the forearm, and sometimes also in the muscles of the hand. When 50–60 contractions had been completed, there was slight or moderate pain in the forearm muscles. The contractions were then stopped, and the arm was rested with the ischæmia still maintained. At first the pain present decreased, sometimes to zero, and tingling was felt. After 1–3 min., with the arm still at rest, the pain returned and began to build up steadily, until after 8–15 min. (the speed of development of the pain depending on the number of contractions, room temperature, and perhaps other factors) the pain became intolerable. The cuff was then deflated, and the pain disappeared within a few seconds.

At first it was easy to distinguish 5 grades of pain: slight, moderate, severe, very severe, and intolerable. With further experience it was easy to distinguish intermediate grades of intensity of pain, and for convenience the pain intensity has been described in units from 1 to 10.

INFECTION THROUGH SOAKED DRESSINGS

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IN 1943 Owens, in a paper on the use of pressure dressings in the treatment of burns and other wounds, reported that " outside contamination can reach a wound through the entire thickness of a dressing." That conclusion was based on in-vitro experiments with artificial " wounds " which showed that " it was possible to draw organisms through as many as 64 thicknesses of gauze from the outside." Other experiments showed that a layer of 'Cellophane' interposed between the moistened dressings and the contaminant effectively barred the passage of the organisms. (It may well be that this passage of organisms through a dressing from the outside was recognised during the Listerian era, and that the impregnation of the dressing-materials with antiseptics —e.g., mercuric cyanide—was partly designed to prevent it, but we are not familiar with any experimental work on the subject.)

Owens's work did not come to our notice until 1947, after we had carried out similar in-vitro experiments which are briefly reported here. We became interested in the subject in the following circumstances:

A.B., a man with severe electric burns of both hands and forearms, received the standard plenary dressing within two hours of his accident. Swabs from the hands were examined *before they were cleaned and did not grow Ps. pyocyanea or* any other pathogen. The plenary dressing consisted of thorough cleaning with cetrimide ('Cetavlon') solution, a generous application of cream containing penicillin 200 units per g. and sulphathiazole 3%, and then plenty of sterile gauze and wool, the whole carefully fixed with many crêpe bandages under mild pressure, completely enclosing both limbs to well above the burned areas. This dressing was done under very strict aseptic precaution in the room used exclusively for the first dressing of fresh burns. During the previous twelve months there had been no instance of infection of a fresh burn referable to infection in this room.

As often happens with severe burns, the dressings and bandages over the dependent parts became soaked with serous exudate, and according to custom these dressings were " packed " with more sterile wool and more crêpe bandages. The original dressings were not disturbed in any way, because they were in good order and fitting snugly to the limbs. On the fifth day the characteristic blue-green staining of *Ps. pyocyanea* was noticed on the outer bandage of one arm. Re-dressing next day revealed the presence of *Ps. pyocyanea* on both hands.

Reflection on the possible source of this infection suggested at once a connexion with two other men in the same ward (one only 12–15 ft. away) with a similar infection. Both of these had old burns already infected on admission (4 months in one case and 14 days in the other). They were confined to bed, but there was clearly the possibility that the organisms had been transmitted from them to A.B. either by the air or by indirect contact —e.g., by nurses' hands or clothing during the process of making beds. That at once suggested the question: could the *Ps. pyocyanea* grow through the intact dressings of A.B. when they were soaked with serous exudate?

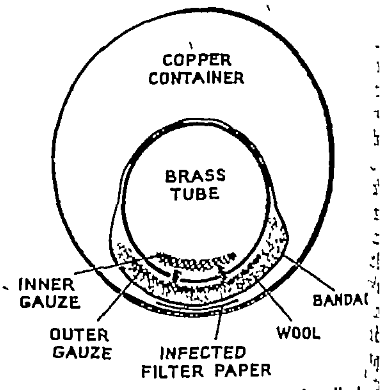
EXPERIMENTS

To investigate this possibility an experimental " wound " was devised and used as follows:

Several holes were drilled near one end of a piece of brass tubing 8 in. long and 2 in. in diameter. Through these holes wicks of gauze were carried to assist the seepage of flu from a loose piece of gauze placed on the inside of the tu (simulating the " weeping " tissues of a wound) to the gau wool, and bandages wrapped round the outside (see figur The tubing with its " wound " was then placed horizontall resting on a piece of filter paper (which would later rece the inoculum of organisms), inside a sealed copper contain and sterilised in the autoclave.

For each experiment an artificial " wound " of t kind in its container was placed horizontally in t incubator, and the inner gauze was first primed by series of additions of sterile fluid until, after a few hou the outer bandage was just moist. Since blister flu from burned patients was not available in sufficie quantity, the fluid used for most of the tests was dri plasma dissolved in nutrient broth—to simulate t exudate from burned surfaces.

As soon as the outer bandage had become moist (t filter paper helped to detect this), its sterility, as well that of the inner gauze, was checked by the usual swab examination, and the bandage was then infected by pipetting about 1 ml. of a thousandfold diluted culture of *Ps. pyocyanea* or other organism on to the filter paper. The whole was then reincubated on its side, and further bacteriological tests were made at intervals, both fro the inner gauze and from the bandage. If necessar fresh supplies of sterile fluid were added to the inn gauze from time to time to keep it moist, with appropri precautions against introducing any infection.



Apparatus used in experiment describ text.

RESULTS

The results were briefly as follows:

Organism and number of strains tested	*Interval between infection outer bandage and recovery of organism from inner gauz*
Ps. pyocyanea (9)	Varied from 4 to 48 hr.
Proteus (4)	" " 18 to 42 "
Staph. aureus (4)..	42 hr.
Diphtheroid bacillus (1) ..	42 hr.
Hæmolytic streptococcus (3)* ..	Varied from 24 to 48 hr
Coliform bacillus (1)	42 hr.

* For these tests it was necessary to use a silver-plated tube an aluminium container, because the copper and brass kill the organisms.

Other tests showed:

(1) That a plaster-of-paris shell over the bandag did not interfere with the ingrowing of the organism (*Ps. pyocyanea* grew through in 86–110 hours, an *Proteus* in 42 hours.)

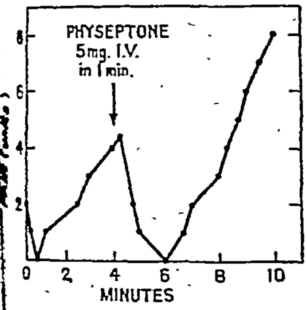
(2) A sheet of cellophane (*supplied by British Cello*phane Co. with the designation P.T.300) interpose between the wool and the bandages did not allow th passage of organisms (6 tests).

(3) A thin sheet of 'Polythene' was also an effectiv barrier.

(4) When the outermost layer of plasma-soaked dressing consisted of many layers of mercuric-cyanide gauze, *Ps. pyocyanea* and *Proteus* and *Staph. aureus* grew through, but not hæmolytic streptococcus, which seemed to be killed off by the cyanide.

the period of testing, the response to a previously determined threshold dose of another drug was usually retested to check the subject's sensitivity.

For example, with subject C. A. K. 0·2 mg. of C.B.11 had no effect, but 0·3 mg. reduced the pain intensity from 4 to 2 units. The threshold dose was taken as 0·25 mg. In other instances the subject's response was of a border-line character, a sort of plateau effect in which the pain curve was just affected. The dose which produced such a response was accepted as the threshold value.



1—Analgesic action of physeptone on ischæmic muscular pain in forearm (contractions) in subject J. W. M.

Threshold determinations gave different results in the three persons studied. The threshold doses found for several drugs were as follows:

Drug	*C. A. K.*	*J. W. M.*	*R. M. L. D.*
Morphine	0·002 mg.	0·1 mg.	0·35 mg.
Pethidine	7·5 mg.	1 mg.	7·5 mg.
Physeptone	0·25 mg.	0·1 mg.	0·3 mg.
C.B.11	0·25 mg.	0·01 mg.	0·4 mg.
Amidone	0·3 mg.	—	—
Hoechst 10582 ..	0·4 mg.	—	—

Thus in subject C. A. K. physeptone and C.B.11 were both [illegible] times as potent as pethidine (the action of morphine was exceptional in this person and is discussed below). In subject J. W. M. morphine and physeptone were both 10 times as potent as pethidine, but were only $^1/_{10}$ as powerful as C.B.11. In subject R. M. L. D. morphine, physeptone, and C.B.11 were about equianalgesic and were 20–25 times more potent than pethidine.

These results may be compared with the figures obtained by Thorp et al. (1947) in experiments on analgesia in rats, in which morphine and physeptone were equally active and about 10 times as potent as pethidine.

We think that individual variations in sensitivity to analgesics are important. Subject J. W. M. was always more responsive to analgesic drugs than subject R. M. L. D. This difference was seen at all dosage levels but was most clearly shown in the threshold measurements. Subject C. A. K. closely resembled subject R. M. L. D. except in his response to morphine. These differences could hardly be attributed solely to differences in body-weight (J. W. M. weighed 11 st. 1 lb., R. M. L. D. 13 st., and C. A. K. 13 st. 4 lb.).

It is therefore obvious that clinical differences in response to analgesics can, at least in part, be ascribed to differences in sensitivity towards them. Since in our experiments the drugs were given intravenously, the differences in sensitivity cannot be due to variable absorption and must therefore represent true differences in analgesic potency. In patients variable absorption from the gut or from the site of injection will contribute other possibilities for variation in response.

CHANGES IN THRESHOLD WITH TIME

We have already pointed out that the threshold should be determined in a short time. The reason for this precaution is that the threshold may change after several months. It would perhaps be generally expected, from the well-known development of tolerance to morphine, that the threshold would rise with the regular performance of these analgesic tests, but the exact opposite was invariably found.

For example, on June 12, 1947, in subject R. M. L. D. the threshold dose of physeptone was 2·5 mg., whereas on Jan. 7, 1948, it was 0·4 mg. Threshold values were not usually determined in the earlier part of our work; hence precise differences in sensitivity cannot be stated, but the responses to supraliminal doses undoubtedly increased with time. Thus in subject J. W. M. the initial response to 1 mg. of C.B.11 was a reduction of pain from 5 to 2 units; this same response later was given to 0·1 mg. of C.B.11.

In general the increase in sensitivity appeared to be about equal for all the drugs studied, and was probably due, *at least in part, to the acquisition of greater skill* in recognising small changes in pain intensity, but we feel that some true increase in sensitivity must also have developed.

In subject C. A. K. an extraordinary increase in sensitivity to morphine developed. In May and June, 1947, the effect of 5·0 and 7·5 mg. was to reduce the pain from 4 units to 1 unit and from 4 units to 0 respectively. These doses produced a definite subjective feeling of respiratory depression and a characteristic occipital headache. The reaction was rather unpleasant at first but was followed by euphoria. On Oct. 24, 1947, it was intended to repeat the 5 mg. dose to see how far the response had changed. When only 2·5 mg. of morphine had been given in $^1/_2$ min., the effects developed very suddenly and were *much greater in all respects than with 7·5 mg. of* morphine five months earlier. Subsequently 0·3 mg. produced an effect definitely greater than did the original 7·5 mg. dose, and later the threshold dose was about 0·002 mg.

Such an increase in sensitivity (about a thousandfold) might suggest an allergic response; but, unlike such a reaction, the hypersensitivity concerned all the pharmacological effects originally elicited by the larger doses. Analgesia, respiratory depression, and occipital headache were about equally intensified. The threshold dose of morphine in J. W. M. was 0·1 mg., and in R. M. L. D. 0·35 mg. The cause of this remarkable sensitisation is not clear, but it might be related to the intravenous route of administration.

ANÆSTHETIC GASES

The analgesic actions of nitrous oxide and cyclopropane were easily demonstrated by the ischæmic-pain method.

Nitrous oxide was given in concentrations of 10–40% in oxygen, the proportions being measured with a rotameter. The ischæmic pain was allowed to develop till the intensity had reached 4 or 5 units, when the gas was inhaled.

A typical result, in subject R. M. L. D., is shown in fig. 4, where inhalation of 20% nitrous oxide and 80% oxygen reduced the pain from 4 units to 1 unit and greatly delayed the increase in pain intensity which would normally have been expected.

In subject J. W. M. the following results were obtained:

Nitrous oxide	*Oxygen*	*Result*
10% ..	90% ..	No effect on pain
15% ..	85% ..	Pain fell from 5→3 units
20% ..	80% ..	„ „ „ 5→1 unit
30% ..	70% ..	„ „ „ 5→1 „
40% ..	60% ..	„ „ „ 5→0 „

Minnitt's apparatus was also tested for its effect on ischæmic muscle pain, 45% nitrous oxide and 55% air

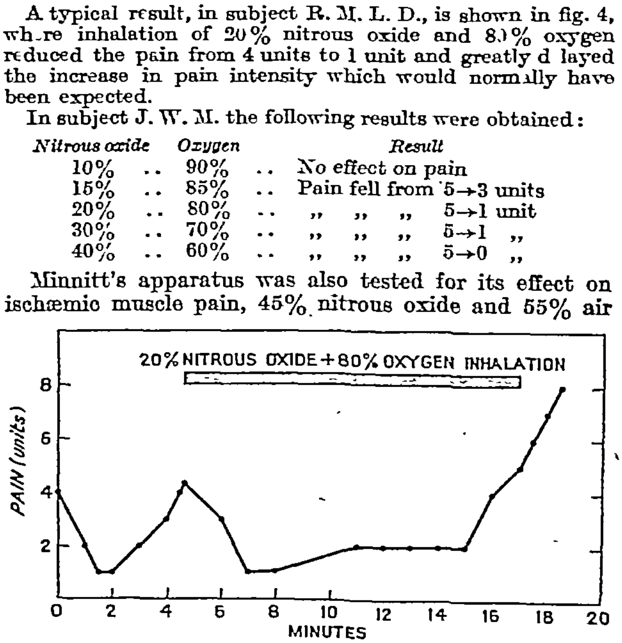


Fig. 4—Analgesic action of nitrous oxide on ischæmic muscular pain in forearm (55 contractions) in subject R. M. L. D.

TESTS OF ANALGESICS

In testing the effects of analgesics the pain was allowed to reach a value of 4–5 units. The drug to be tested was then administered—gases by inhalation, and other drugs by intravenous injection. The gases studied were nitrous oxide and cyclopropane. Nitrous oxide was given in concentrations of 10–40% in oxygen, and cyclopropane in concentrations of 2–3% in oxygen. The proportions of the gases in oxygen were measured with a 'Rotameter,' and the rate of flow was kept fast enough to prevent rebreathing.

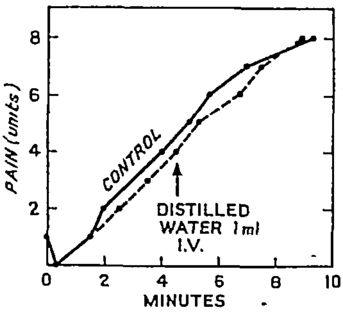


Fig. 1—Effect of injection of distilled water on ischæmic muscular pain in forearm after 55 contractions in subject J. W. M. compared with increase of pain without any injection. Note similarity of curves.

The analgesics given by intravenous injection were as follows:

(1) Morphine (sulphate or hydrochloride).
(2) Pethidine hydrochloride.
(3) *dl*-2-dimethylamino-4 : 4-diphenyl-heptan-5-one hydrochloride ('Physeptone,' 'Amidone,' 'Miadone,' 'Hoechst 10820').
(4) *dl*-1-dimethylamino-3 : 3-diphenyl-hexan-4-one hydrochloride ('Hoechst 10582').
(5) *dl*-2-dimethylaminomethyl-3 : 3-diphenyl-hexan-4-one hydrochloride ('Isoamidone').
(6) *dl*-2-1'morpholino-4 : 4-diphenyl-heptan-5-one hydrochloride ('C.B.11').
(7) Procaine hydrochloride.
(8) Thiopentone soluble.
(9) 'Benadryl' hydrochloride.
(10) N-p-methoxybenzyl-N-dimethylaminoethyl-2-amino-pyridine maleate ('Neoantergan,' 'Anthisan,' pyranisamine maleate).
(11) N-phenyl-N-benzyl-2-methylimidazoline ('Antistin').
(12) Tetraethylammonium bromide (T.E.A.B.).

When morphine, pethidine, and physeptone were given in larger doses, the rate of intravenous injection was 5 mg. per min. for morphine and physeptone, and 50 mg. per min. for pethidine. The maximal doses of morphine, physeptone, and pethidine were 7·5 mg., 7·5 mg., and 75·0 mg. respectively. When the duration of injection was varied with the dose, the needle was kept in the vein for the maximal period of 1½ min., so that the subject could not guess the size of the injected dose from the duration of its administration. Later on, when threshold studies were undertaken, the period of injection was 1 min. in all cases.

CONTROL OBSERVATIONS

In studies based on subjective impressions adequate control observations are imperative. Therefore (1) we obtained numerous records of the increase in pain with time in the absence of any injection; (2) we sometimes injected distilled water; and (3) in determining threshold doses we injected subliminal quantities of analgesics, the subject being unaware of the nature or the dose of the injected drug. In all these instances there was a steady increase in intensity of pain to a value of 8 units in 8–15 min. Under the conditions of our experiments there were some minor fluctuations in the ischæmic pain, but these were in no way comparable with the clear-cut relief of pain produced by an adequate dose of an analgesic.

Fig. 1 illustrates the absence of effect of an injection of distilled water in a subject (J. W. M.) who was expecting an injection of an effective dose of pethidine and was extremely disappointed with his inability to record any analgesia. The rate of increase in pain intensity after distilled water compared with a typical rate of increase in the absence of a injection; the curves are clearly very similar.

Fig. 2 shows curves obtained from subjects R. M. L. D. an C. A. K. when they received subliminal doses of [illegible] (0·25 mg.) and C.B.11 (0·20 mg.) respectively. In both cas the rate of increase in pain intensity was similar to th recorded when no injection was given.

RESULTS OF INJECTION OF ANALGESICS

Intravenous injection of morphine, pethidine, ph septone, or C.B.11 produced effects which develop either during the latter part of the injection or 1 or min. after the injection. The effects rapidly became max mal with the larger doses—e.g., 5·0–7·5 mg. of morphi or of physeptone, and 50–75 mg. of pethidine— the relief of pain was associated with well-mark side-effects (see below).

A typical illustration of the analgesic action is seen fig. 3, which shows the effect of 5 mg. of physeptone inject in 1 min. in subject J. W. M. The relief of pain was complet but the effect was transient, and subsequently the p increased rapidly. The brief duration of the analgesia was d partly to the fact that the intensity of the ischæmic mus pain was increasing continuously and soon overcame t initial maximal effect of the intravenous analgesic, and part to redistribution of the drug from its original site of fixati in the brain. With smaller doses the relief of pain w proportionately less.

At first we tried to compare the analgesic potenc by finding the smallest dose which would produ complete relief of pain of 4–5 units intensity, as shown, f example, for subject J. W. M. with physeptone (fig. This method of comparison suggested that 7·5 mg. morphine was equivalent to 7·5 mg. of physeptone an to 75·0 mg. of pethidine; in other words, morphine an physeptone were equianalgesic, and both were abo 10 times as potent as pethidine. However, such lar doses produced side-effects which were too great, and aft effects which were too protracted, for the necessary repeated observations. So we finally decided to determine the threshold dose of each drug—i.e., the smallest dose which would produce a definite effect on 4–5 units of pain. Such tests were found most satisfactory and had the great advantage of causing little general disturbance and no after effects, with the result that several tests could be made in a week. Over short periods—e.g., a few weeks—the threshold values remained constant; but, when tests were repeated after several month changes in threshold doses were found (see below).

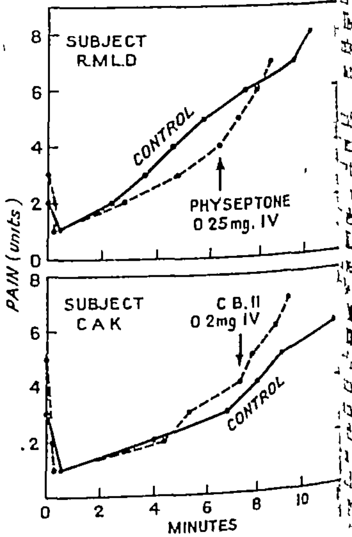


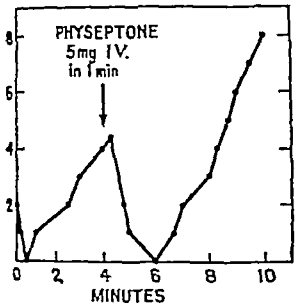
Fig. 2—Effects of injections of subliminal dose of analgesics on ischæmic muscular pain i forearm (55 contractions in subject R. M. L. D. and 50 contractions in subject C A K.) com pared with increase of pain without an injection. Note similarity of curves.

DETERMINATION OF THRESHOLD DOSE

The threshold dose for each drug was determined as follows:

Doses well above and well below the threshold were given. Next the range was narrowed till there was only a small difference between the effective and ineffective doses. During this period of testing, the response to a previously determined threshold dose of another drug was usually retested to check the subject's sensitivity.

For example, with subject C. A. K. 0·2 mg. of C.B.11 had no effect, but 0·3 mg. reduced the pain intensity from 4 to 2 units. The threshold dose was taken as 0·25 mg. In other instances the subject's response was of a border-line character, a sort of plateau effect in which the pain curve was just affected. The dose which produced such a response was accepted as the threshold value.



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midone	0·3 mg.	—	—
chst 10582 ..	0·4 mg.	—	—

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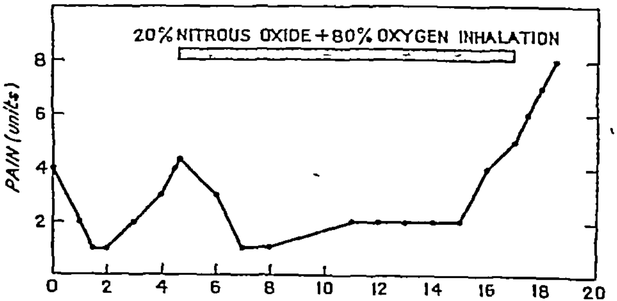

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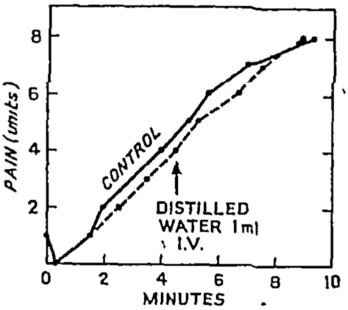


Fig. 1—Effect of injection of distilled water on ischæmic muscular pain in forearm after 55 contractions in subject J. W. M. compared with increase of pain without any injection. Note similarity of curves.

The analgesics given by intravenous injection were as follows:

(1) Morphine (sulphate or hydrochloride).
(2) Pethidine hydrochloride.
(3) *dl*-2-dimethylamino-4 : 4-diphenyl-heptan-5-one hydrochloride (' Physeptone,' ' Amidone,' ' Miadone,' ' Hoechst 10820 ').
(4) *dl*-1-dimethylamino-3 : 3-diphenyl-hexan-4-one hydrochloride (' Hoechst 10582 ').
(5) *dl*-2-dimethylaminomethyl-3 : 3-diphenyl-hexan-4-one hydrochloride (' Isoamidone ').
(6) *dl*-2-l'morpholino-4 : 4-diphenyl-heptan-5-one hydrochloride (' C.B.11 ').
(7) Procaine hydrochloride.
(8) Thiopentone soluble.
(9) ' Benadryl ' hydrochloride.
(10) N-p-methoxybenzyl-N-dimethylaminoethyl-2-aminopyridine maleate (' Neoantergan,' ' Anthisan,' pyranisamine maleate).
(11) N-phenyl-N-benzyl-2-methylimidazoline (' Antistin ').
(12) Tetraethylammonium bromide (T.E.A.B.).

When morphine, pethidine, and physeptone were given in larger doses, the rate of intravenous injection was 5 mg. per min. for morphine and physeptone, and 50 mg. per min. for pethidine. The maximal doses of morphine, physeptone, and pethidine were 7·5 mg., 7·5 mg., and 75·0 mg. respectively. When the duration of injection was varied with the dose, the needle was kept in the vein for the maximal period of 1½ min., so that the subject could not guess the size of the injected dose from the duration of its administration. Later on, when threshold studies were undertaken, the period of injection was 1 min. in all cases.

CONTROL OBSERVATIONS

In studies based on subjective impressions adequate control observations are imperative. Therefore (1) we obtained numerous records of the increase in pain with time in the absence of any injection; (2) we sometimes *injected distilled water; and (3) in determining threshold* doses we injected subliminal quantities of analgesics, the subject being unaware of the nature or the dose of the injected drug. In all these instances there was a steady increase in intensity of pain to a value of 8 units in 8–15 min. Under the conditions of our experiments there were some minor fluctuations in the ischæmic pain, but these were in no way comparable with the clear-cut relief of pain produced by an adequate dose of an analgesic.

Fig. 1 illustrates the absence of effect of an injection of distilled water in a subject (J. W. M.) who was expecting an injection of an effective dose of pethidine and was extremely disappointed with his inability to record any analgesia. The rate of increase in pain intensity after distilled water compared with a typical rate of increase in the absence of a injection; *the curves are clearly very similar.*

Fig. 2 shows curves obtained from subjects R. M. L. D. an C. A. K. when they received subliminal doses of physepto (0·25 mg.) and C.B.11 (0·20 mg.) respectively. In both cas the rate of increase in pain intensity was similar to th recorded when no injection was given.

RESULTS OF INJECTION OF ANALGESICS

Intravenous injection of morphine, pethidine, ph septone, or C.B.11 produced effects which develop either during the latter part of the injection or 1 or min. after the injection. The effects rapidly became ma mal with the larger doses—e.g., 5·0–7·5 mg. of morphi or of physeptone, and 50–75 mg. of pethidine—a the relief of pain was associated with well-mark side-effects (see below).

A typical illustration of the analgesic action is seen fig. 3, which shows the effect of 5 mg. of physeptone inject in 1 min. in subject J. W. M. The relief of pain was complet but the effect was transient, and subsequently the pa increased rapidly. The brief duration of the analgesia was d partly to the fact that the intensity of the ischæmic mus pain was increasing continuously and soon overcame t initial maximal effect of the intravenous analgesic, and par to redistribution of the drug from its original site of fixat in the brain. With smaller doses the relief of pain w proportionately less.

At first we tried to compare the analgesic potenc by finding the smallest dose which would produ complete relief of pain of 4–5 units intensity, as shown, f example, for subject J. W. M. with physeptone (fig. This method of comparison suggested that 7·5 mg. morphine was equivalent to 7·5 mg. of physeptone an *to 75·0 mg. of pethidine; in other words,* morphine a physeptone were equianalgesic, and both were abo 10 times as potent as pethidine. However, such lar doses produced side-effects which were too great, and aft effects which were too protracted, for the necessary repeated observations. So we finally decided to determine the threshold dose of each drug—i.e., the smallest dose which would produce a definite effect on 4–5 units of pain. Such tests were found most satisfactory and had the great advantage of causing little general disturbance and no after effects, with the result that several tests could be made in a week. *Over* short periods—e.g., a few weeks—the threshold values remained constant; but, when tests were repeated after several months, changes in threshold doses were found (see below).

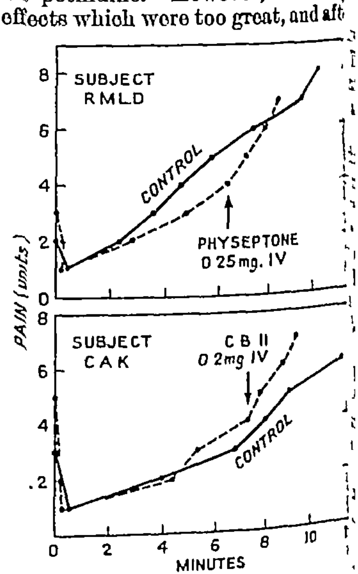


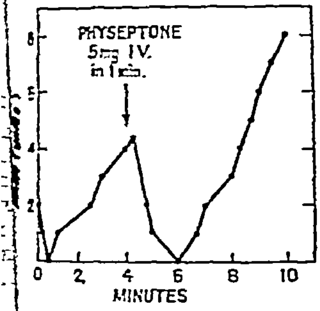
Fig. 2—Effects of injections of subliminal doses of analgesics on ischæmic muscular pain in forearm (55 contractions in subject R. M. L. D. and 50 contractions in subject C. A. K.) compared with increase of pain without any injection. **Note similarity of curves.**

DETERMINATION OF THRESHOLD DOSE

The threshold dose for each drug was determined as follows:

Doses well above and well below the threshold were given. Next the range was narrowed till there was *only* a small difference between the effective and ineffective doses. During period of testing, the response to a previously determined old dose of another drug was usually retested to check subject's sensitivity.

For example, with subject C. A. K. 0·2 mg. of C.B.11 had no effect, but 0·3 mg. reduced the pain intensity from 4 to 2 units. The threshold dose was taken as 0·25 mg. In other instances the subject's response was of a border-line character, a sort of plateau effect in which the pain curve was just affected. The dose which produced such a response was accepted as the threshold value.



1—Analgesic action of physeptone on mic muscular pain in forearm contractions) in subject J. W. M

Threshold determinations gave different results in the three persons studied. The threshold [illegible] found for several drugs were as follows:

Drug	C. A. K.	J. W. M.	R. M. L. D.
phine	0·002 mg.	0·1 mg.	0·35 mg.
dine	7·5 mg.	1 mg.	7·5 mg.
ptone	0·25 mg.	0·1 mg.	0·3 mg.
11	0·25 mg.	0·01 mg.	0·4 mg.
idone	0·3 mg.	—	—
st 10582 ..	0·4 mg.	—	—

in subject C. A. K. physeptone and C.B.11 were both [illegible] times as potent as pethidine (the action of morphine was abnormal in this person and is discussed below). In subject J. W. M. morphine and physeptone were both 10 times as as pethidine, but were only 1/10 as powerful as C.B.11. ject R. M. L. D. morphine, physeptone, and C.B.11 were equianalgesic and were 20–25 times more potent than [illegible].

results may be compared with the figures d by Thorp et al. (1947) in experiments on a in rats, in which morphine and physeptone equally active and about 10 times as potent as ne.

e think that individual variations in sensitivity to esics are important. Subject J. W. M. was always e responsive to analgesic drugs than subject R. M. L. D. difference was seen at all dosage levels but was clearly shown in the threshold measurements. ect C. A. K. closely resembled subject R. M. L. D. t in his response to morphine. These differences d hardly be attributed solely to differences in body-ht (J. W. M. weighed 11 st. 1 lb., R. M. L. D. 13 st., C. A. K. 13 st. 4 lb.).

t is therefore obvious that clinical differences in onse to analgesics can, at least in part, be ascribed fferences in sensitivity towards them. Since in our riments the drugs were given intravenously, the rences in sensitivity cannot be due to variable ption and must therefore represent true differences algesic potency. In patients variable absorption the gut or from the site of injection will contribute er possibilities for variation in response.

CHANGES IN THRESHOLD WITH TIME

We have already pointed out that the threshold should determined in a short time. The reason for this aution is that the threshold may change after ral months. It would perhaps be generally expected, the well-known development of tolerance to phine, that the threshold would rise with the regular formance of these analgesic tests, but the exact osite was invariably found.

For example, on June 12, 1947, in subject R. M. L. D. threshold dose of physeptone was 2·5 mg., whereas Jan. 7, 1948, it was 0·4 mg. Threshold values were not usually determined in the earlier part of our work; hence precise differences in sensitivity cannot be stated, but the responses to supraliminal doses undoubtedly increased with time. Thus in subject J. W. M. the initial response to 1 mg. of C.B.11 was a reduction of pain from 5 to 2 units; this same response later was given to 0·1 mg. of C.B.11.

In general the increase in sensitivity appeared to be about equal for all the drugs studied, and was probably due, at least in part, to the acquisition of greater skill in recognising small changes in pain intensity, but we feel that some true increase in sensitivity must also have developed.

In subject C. A. K. an extraordinary increase in sensitivity to morphine developed. In May and June, 1947, the effect of 5·0 and 7·5 mg. was to reduce the pain from 4 units to 1 unit and from 4 units to 0 respectively. These doses produced a definite subjective feeling of respiratory depression and a characteristic occipital headache. The reaction was rather unpleasant at first but was followed by euphoria. On Oct. 24, 1947, it was intended to repeat the 5 mg. dose to see how far the response had changed. When only 2·5 mg. of morphine had been given in 1/2 min., the effects developed very suddenly *and were much greater in all respects than with 7·5 mg. of* morphine five months earlier. Subsequently 0·3 mg. produced an effect definitely greater than did the original 7·5 mg. dose, and later the threshold dose was about 0·002 mg.

Such an increase in sensitivity (about a thousandfold) might suggest an allergic response; but, unlike such a reaction, the hypersensitivity concerned all the pharmacological effects originally elicited by the larger doses. Analgesia, respiratory depression, and occipital headache were about equally intensified. The threshold dose of morphine in J. W. M. was 0·1 mg., and in R. M. L. D. 0·35 mg. The cause of this remarkable sensitisation is not clear, but it might be related to the intravenous route of administration.

ANÆSTHETIC GASES

The analgesic actions of nitrous oxide and cyclopropane were easily demonstrated by the ischæmic-pain method.

Nitrous oxide was given in concentrations of 10–40% in oxygen, the proportions being measured with a rotameter. The ischæmic pain was allowed to develop till the intensity had reached 4 or 5 units, when the gas was inhaled.

A typical result, in subject R. M. L. D., is shown in fig. 4, where inhalation of 20% nitrous oxide and 80% oxygen reduced the pain from 4 units to 1 unit and greatly delayed the increase in pain intensity which would normally have been expected.

In subject J. W. M. the following results were obtained:

Nitrous oxide	*Oxygen*	*Result*
10% ..	90% ..	No effect on pain
15% ..	85% ..	Pain fell from 5→3 units
20% ..	80% ..	,, ,, ,, 5→1 unit
30% ..	70% ..	,, ,, ,, 5→1 ,,
40% ..	60% ..	,, ,, ,, 5→0 ,,

Minnitt's apparatus was also tested for its effect on ischæmic muscle pain, 45% nitrous oxide and 55% air

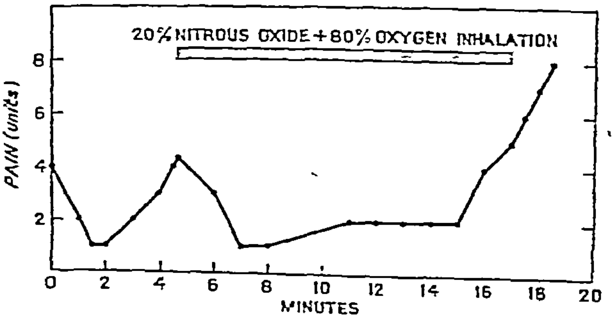


Fig. 4—Analgesic action of nitrous oxide on ischæmic muscular pain in forearm (55 contractions) in subject R. M. L. D.

being inhaled. In subject C. A. K. in three separate experiments the pain was reduced from 5 units to 0, 6 units to 0, and 8 units to 1 unit. In A. J. H. H. pain was reduced from 8 to 4 units.

Cyclopropane was studied in a similar way, 2% and 3% cyclopropane in oxygen being given. The results were as follows :

Cyclopropane	*J. W. M.*	*C. A. K.*	*R. M. L. D.*	*A. J. H. H.*
2% ..	4→2 units	4→1 unit	4→2 units	5→3 units
3% ..	6→1 unit	4→1 ,,	3→1 unit	6→2 ,,

The effects of both these gases were associated with the usual subjective responses noted during induction of anæsthesia with these agents, the degree of such response being proportional to the concentration of anæsthetic gas. In no case did loss of consciousness result, though 40% nitrous oxide almost produced this effect. These results agree very well with those of Seevers et al. (1937), who observed the analgesic actions of such concentrations of these gases on the response to pinpricks of graded pressure.

INTRAVENOUS PROCAINE

The analgesic actions of intravenous procaine have been described by Lundy (1942), Gordon (1943), Allen (1945), and McLachlin (1945). It has been suggested that procaine administered by this route may act either locally on nerve-endings in regions where increased capillary permeability allows greater escape of procaine from the blood-stream, as might happen in burns, or by an action on the central nervous system probably similar to that of well-known analgesics such as morphine and pethidine.

The ischæmic-pain test shows whether the analgesic action of procaine is central or peripheral. If its intravenous administration relieves this pain, the drug must act somewhere central to the site of arterial occlusion in the upper arm, since none of the drug can penetrate to the site of pain production in the ischæmic muscle.

Procaine has been given intravenously to four persons, the dose being 50 mg. in 1 min., or 100 mg. in 2 min. Analgesia of different degrees was produced in all of eight experiments as follows :

Procaine dose	*C. A. K.*	*J. W. M.*	*R. M. L. D.*	*A. J. H. H.*
50 mg. in 1 min.	4→3 units	5→2 units	—	—
100 mg. in 2 min.	4→0 unit	—	6→2 units	4→0 unit
,, ,, ,,	4→1 ,,	—	—	4→0 ,,
,, ,, ,,	4→1 ,,	—	—	—

There is thus no doubt that intravenous procaine can relieve pain by a central action. This does not exclude the possibility of a peripheral action as well, but the latter component is likely to be very small, since extreme dilution of the procaine will have taken place by the time it reaches the affected part. In our experiments procaine analgesia was accompanied by side-effects such as giddiness, light-headedness, nystagmus, and a sensation of respiratory depression.

THIOPENTONE

Thiopentone has also been shown to exert an analgesic effect on ischæmic muscle pain. Thus 100 mg. of sodium thiopentone injected intravenously in 15 sec. produced relief of pain generally comparable to that produced by 30–40% nitrous oxide. The results in four persons were as follows :

J. W. M.	*R. M. L. D.*	*C. A. K.*	*A. J. H. H.*
4→0 unit ..	4→1 unit ..	4→1 unit ..	4→2 units

None of the persons lost consciousness with this dose, but such side-effects as drowsiness, giddiness, a feeling of remoteness, and confusion were well marked, which may have impaired judgment of the results.

ANTI-HISTAMINE DRUGS

It is well known that the anti-histamine drugs have actions unrelated to their antagonism to histamine. For example, they are mostly more powerful local ane thetics than procaine, and they have also been claime to be weak analgesics in rats. We therefore studied tl actions of some of these compounds on ischæmic musc pain. Benadryl, antistin, and neoantergan were giv intravenously, and the following threshold doses we found in the two persons tested :

Drug	*C. A. K.*	*R. M. L. D.*
Benadryl	5·0 mg. ..	5·0 mg.
Antistin	7·5 mg. ..	12·5 mg.
Neoantergan ..	2·0 mg. ..	7·5 mg.

TETRAETHYLAMMONIUM BROMIDE (T.E.A.B.)

The actions of T.E.A.B. have recently been studied connexion with its ganglionic blocking effects, w particular relation to sympathetic control of vaso tone in the limbs. A patient with causalgia, under t care of Prof. A. Kekwick, showed relief of this pain at intravenous injection of 200 mg. of T.E.A.B. This d produced a well-marked fall in blood-pressure.

The possibility of a central analgesic action w investigated by injecting T.E.A.B. intravenously i subjects R. M. L. D. (75 mg.) and C. A. K. (100 mg.), wl ischæmic pain had been produced in the usual way. B persons noted slight relief of pain ; but, when the do of T.E.A.B. are compared with the threshold doses of ot compounds studied, it will be seen that T.E.A.B. is a v feeble analgesic. However, it may well be that the re of causalgic pain recorded by Conley et al. (1947) a injection of up to 500 mg. of T.E.A.B. was due more t central analgesic action than to any circulatory chan

SIDE-EFFECTS OF ANALGESIC DRUGS

When the larger doses of morphine (5·0–7·5 m pethidine (25–75 mg.), physeptone (2·5–7·5 mg.), or C.B (1·0–2·5 mg.) were given, side-effects were well mar and usually so characteristic that the drug could readily identified. Apart from differences between various drugs there were differences between individ responses to the same drug. In studies on threshold do it was found that with slightly supraliminal do analgesia could sometimes be obtained without side-effects.

For example, subject J. W. M. had no side-effects with C 11 in doses less than 0·5 mg., but the threshold analgesic d was 0·01 mg. ; and subject R. M. L. D. had no side-effe with physeptone in doses less than 2·5 mg. (threshold d 0·3 mg.). On the other hand, subject R. M. L. D. showed si effects with morphine in doses down to 0·1 mg., but analgesia with doses less than 0·4 mg.

Thus there was usually analgesia before the onset side-effects, but sometimes the order was reversed. Th might well explain differences in clinical response analgesics.

The most important side-effect with morphine, pet dine, physeptone, and C.B.11 was euphoria, which last for several hours after the larger doses of these dru This feeling of well-being usually outlasted other si effects and in some instances persisted for 24 hours. T four subjects showed differences in their liability euphoria, the order for the four drugs in each subje being as follows :

C. A. K. : (1) physeptone, (2) pethidine, (3) morphi (4) C.B.11.

J. W. M. : (1) pethidine, (2) physeptone, (3) morphi (4) C.B.11.

R. M. L. D. : (1) pethidine, (2) physeptone, (3) morphi (4) C.B.11.

A. J. H. H. : (1) morphine, (2) pethidine, (3) physepto (C.B.11 not tested).

The position of C.B.11 may have been due to the use small doses of this drug. The differences between othe drugs were partly due to accompanying dysphoric effect —e.g., nausea and giddiness, which would easily out weigh any tendency to look on the brighter side of lif importance of euphoria lies in its close relation to liability to drug addiction.

The other drugs had different effects on mood. The effects of nitrous oxide were pleasant but differed from those of the drugs just mentioned. The effects of procaine. especially when given by continuous infusion. were described by subjects A. J. H. H. and C. A. K. as definitely pleasant. There was no euphoria with thiopentone. the antihistamine drugs. or T.E.A.B.

Other side-effects noted with all the drugs included light-headedness, giddiness, and a feeling of remoteness. With pethidine, physeptone. and procaine nystagmus with blurred and double vision was often noted. Morphine, pethidine, physeptone, C.B.11, and procaine are all liable to produce a sensation of difficulty in breathing. Thiopentone produced confusion and well-marked drowsiness in all subjects. Neoantergan produced drowsiness even in threshold doses with subject C. A. K. but not with subject R. M. L. D.

DISCUSSION

The various methods hitherto used to test analgesics in animals and man have all involved measurement of the threshold of a painful stimulus of brief duration. In Macht et al. (1916) used a faradic current; Seevers and Pfeiffer (1936) measured the response to graded pressure with von Frey's hairs or needle prick; Hardy et al. (1940) applied radiant heat to the blackened skin of the forehead; Goetzl et al. (1943) applied an alternating current to a dental filling; and Harrison and [illegible] (1943) measured the number of ischæmic muscle contractions in the forearm required to produce pain.

It is plainly an advantage to be able to measure the strength of stimulus, but it must be remembered that analgesics are most often given to patients in whom pain is already present at a level well above threshold. Hardy et al. (1940) have shown that, when morphine is given to persons enduring experimentally induced pain, the threshold-raising action of the drug is almost completely abolished. They suggest that the relief of pain by morphine is due largely to detachment of pain perception from a psychological reaction pattern involving withdrawal, fear, flight, and anxiety, and to the production of lethargy and sleep. The response to analgesics of patients with severe pain may therefore not be closely related to pain-threshold-raising mechanisms. It should be emphasised that in our work the word "threshold" applies to the dose of drug given and not the strength of stimulus.

The most satisfactory procedure would be to compare the potency of analgesics in patients actually suffering from pain, since in any case this is the final field of application. Intelligent coöperative persons with chronic pain can sometimes, in our experience (which confirms that of Keele 1948), give reliable interpretations of their sensation of pain, and can give assessments of the intensity of pain which correlate well with variations in dosage of a given drug and with changes from one drug to another. But it is not always easy to find subjects with all the necessary qualifications, since chronic pain may arise from diseases which make accurate observation difficult, and the emotional reactions to continuous pain may render coöperation impossible. It was for these reasons that our work was directed to experimentally induced pain in man, and our method of testing may be regarded as intermediate between pain-threshold and clinical studies.

The purely subjective assessment of pain calls for comment. Some patients could describe 4 or 5 grades of intensity of pain quite readily and with apparent consistency. It was thought that what patients of various grades of intelligence and powers of description could do student volunteers and members of the academic staff might do as well, if not better. With experience and practice it was found possible to distinguish about 10 grades of ischæmic muscle pain, the greater fineness of discrimination being perhaps due to the fact that the pain was steadily increasing during a short time (10–15 min.), no feats of memory of previous intensities of pain being required. Moreover, the constant number of ischæmic muscular contractions ensured fairly comparable curves of pain intensity in different experiments.

Hardy et al. (1947) have made observations on a pain-intensity scale, using thermal radiation pain in the skin. They recorded 21 just perceptible steps between threshold sensation and ceiling pain. They have adopted as the unit of pain intensity the dol: 1 dol = 2 just-perceptible steps in discrimination of stimulus intensity. The whole range of pain intensity would thus equal 10½ dols. Our distinction of only 10 grades of intensity of pain (instead of 21 grades) may be related to the differences in character of a deep as opposed to a superficial pain.

The importance of adequate control studies has been fully appreciated in the course of this work, and the injection of distilled water or subthreshold doses of the analgesics gave consistently negative results. It is true that an increase in sensitivity to morphine, pethidine, and physeptone was recorded. but this change only took place over a long time and (apart from the remarkable response of subject C. A. K. to morphine) was similar for these three drugs. When tests were made at short intervals there were no discrepancies.

It might still be suggested that, instead of subjective criteria, however well controlled, objective measurements of accompaniments of pain should be used. The rise of blood-pressure and increase of heart-rate described by Alam and Smirk (1937. 1938) and the diminution in electrical skin resistance (Thompson and Gellhorn 1945). all noted during ischæmic muscular pain, were considered but, after preliminary tests, were found to be of little value. First. the extent of such changes varies widely from person to person; secondly, such changes are very small or non-existent with mild or moderate pain; and thirdly, analgesics might affect these readings by mechanisms distinct from the central relief of pain.

This work has shown that individual variations in sensitivity to both relief of pain and development of side-effects may be considerable. It seems likely that these variations are important in relation to the therapeutic effectiveness of these drugs in the relief of pain in disease.

(1) Variations in sensitivity to analgesic action will mean that with a given dose some persons will get better relief of pain than others.

(2) Side-effects may arise much more readily in some people than in others. Indeed, in some persons side-effects may arise before analgesia is produced. Since, as shown here, the relations between analgesic action and side-effects vary in one person from one drug to another, it is easy to understand why one drug may be therapeutically more satisfactory than another. It is therefore difficult to generalise, and at present it is impossible to explain or to correlate the varied responses seen in different persons.

In patients the relief of pain is more complicated than in these experiments. Our subjects were volunteers interested in the work; it was always known that the duration of pain would be relatively brief—i.e., 15 min. or less—and, more important, that if the subject decided that the pain was intolerable he could instantly procure relief by releasing the cuff. In patients pain is naturally resented, its duration may be considerable, and its appreciation may be linked with anxiety about the disease causing the pain. In these circumstances relief of pain is probably due more to the psychological than to the threshold-raising component of analgesic drug action.

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Cyclopropane was studied in a similar way, 2% and 3% cyclopropane in oxygen being given. The results were as follows :

Cyclopropane	*J. W. M.*	*C. A. K.*	*R. M. L. D.*	*A. J. H. H.*
2% ..	4→2 units	4→1 unit	4→2 units	5→3 units
3% ..	6→1 unit	4→1 "	3→1 unit	6→2 "

The effects of both these gases were associated with the usual subjective responses noted during induction of anæsthesia with these agents, the degree of such response being proportional to the concentration of anæsthetic gas. In no case did loss of consciousness result, though 40% nitrous oxide almost produced this effect. These results agree very well with those of Seevers et al. (1937), who observed the analgesic actions of such concentrations of these gases on the response to pinpricks of graded pressure.

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Procaine has been given intravenously to four persons, the dose being 50 mg. in 1 min., or 100 mg. in 2 min. Analgesia of different degrees was produced in all of eight experiments as follows :

Procaine dose	*C. A. K.*	*J. W. M.*	*R. M. L. D.*	*A. J. H. H.*
50 mg. in 1 min.	4→3 units	5→2 units	—	—
100 mg. in 2 min.	4→0 unit	—	6→2 units	4→0 unit
" " "	4→1 "	—	—	4→0 "
" " "	4→1 "	—	—	—

There is thus no doubt that intravenous procaine can relieve pain by a central action. This does not exclude the possibility of a peripheral action as well, but the latter component is likely to be very small, since extreme dilution of the procaine will have taken place by the time it reaches the affected part. In our experiments procaine analgesia was accompanied by side-effects such as *giddiness, light-headedness, nystagmus, and a sensation* of respiratory depression.

THIOPENTONE

Thiopentone has also been shown to exert an analgesic effect on ischæmic muscle pain. Thus 100 mg. of sodium thiopentone injected intravenously in 15 sec. produced relief of pain generally comparable to that produced by 30–40% nitrous oxide. The results in four persons were as follows :

J. W. M.	*R. M. L. D.*	*C. A. K.*	*A. J. H. H.*
4→0 unit ..	4→1 unit ..	4→1 unit ..	4→2 units

None of the persons lost consciousness with this dose, but such side-effects as drowsiness, giddiness, a feeling of remoteness, and confusion were well marked, which may have impaired judgment of the results.

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Drug	*C. A. K.*	*R. M. L. D.*
Benadryl ..	.. 5·0 mg.	.. 5·0 mg.
Antistin ..	.. 7·5 mg.	.. 12·5 mg.
Neoantergan	.. 2·0 mg.	.. 7·5 mg.

TETRAETHYLAMMONIUM BROMIDE (T.E.A.B.)

The actions of T.E.A.B. have recently been studied connexion with its ganglionic blocking effects, w particular relation to sympathetic control of vaso tone in the limbs. A patient with causalgia, under t care of Prof. A. Kekwick, showed relief of this pain af intravenous injection of 200 mg. of T.E.A.B. This d produced a well-marked fall in blood-pressure.

The *possibility of a central analgesic action* w *investigated by injecting* T.E.A.B. *intravenously* i subjects R. M. L. D. (75 mg.) and C. A. K. (100 mg.), wh ischæmic pain had been produced in the usual way. B persons noted slight relief of pain ; but, when the do of T.E.A.B. are compared with the threshold doses of ot compounds studied, it will be seen that T.E.A.B. is a v feeble analgesic. However, it may well be that the re of causalgic pain recorded by Conley et al. (1947) af injection of up to 500 mg. of T.E.A.B. was due more t central analgesic action than to any circulatory chan

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The most important side-effect with morphine, pet dine, physeptone, and C.B.11 was euphoria, which last for several hours after the larger doses of these dru This feeling of well-being usually outlasted other si effects and in some instances persisted for 24 hours. T four subjects showed differences in their liability euphoria, the order for the four drugs in each subj being as follows :

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It might still be suggested that, instead of subjective criteria, however well controlled. objective measurements of accompaniments of pain should be used. The rise of blood-pressure and increase of heart-rate described by Alam and Smirk (1937. 1938) and the diminution in electrical skin resistance (Thompson and Gellhorn 1945), all noted during ischæmic muscular pain, were considered but. after preliminary tests. were found to be of little value. First. the extent of such changes varies widely from person to person; secondly, such changes are very small or non-existent with mild or moderate pain; and thirdly, analgesics might affect these readings by mechanisms distinct from the central relief of pain.

This work has shown that individual variations in sensitivity to both relief of pain and development of side-effects may be considerable. It seems likely that these variations are important in relation to the therapeutic effectiveness of these drugs in the relief of pain in disease.

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In patients the relief of pain is more complicated than in these experiments. Our subjects were volunteers interested in the work; it was always known that the duration of pain would be relatively brief—i.e., 15 min. or less—and. more important, that if the subject decided that the pain was intolerable he could instantly procure relief by releasing the cuff. In patients pain is naturally resented. its duration may be considerable, and its appreciation may be linked with anxiety about the disease causing the pain. In these circumstances relief of pain is probably due more to the psychological than to the threshold-raising component of analgesic drug action.

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Cyclopropane was studied in a similar way, 2% and 3% cyclopropane in oxygen being given. The results were as follows:

Cyclopropane	*J. W. M.*	*C. A. K.*	*R. M. L. D.*	*A. J. H. H.*
2% ..	4→2 units	4→1 unit	4→2 units	5→3 units
3% ..	6→1 unit	4→1 ,,	3→1 unit	6→2 ,,

The effects of both these gases were associated with the usual subjective responses noted during induction of anæsthesia with these agents, the degree of such response being proportional to the concentration of anæsthetic gas. In no case did loss of consciousness result, though 40% nitrous oxide almost produced this effect. These results agree very well with those of Seevers et al. (1937), who observed the analgesic actions of such concentrations of these gases on the response to pinpricks of graded pressure.

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The analgesic actions of intravenous procaine have been described by Lundy (1942), Gordon (1943), Allen (1945), and McLachlin (1945). It has been suggested that procaine administered by this route may act either locally on nerve-endings in regions where increased capillary permeability allows greater escape of procaine from the blood-stream, as might happen in burns, or by an action on the central nervous system probably similar to that of well-known analgesics such as morphine and pethidine.

The ischæmic-pain test shows whether the analgesic action of procaine is central or peripheral. If its intravenous administration relieves this pain, the drug must act somewhere central to the site of arterial occlusion in the upper arm, since none of the drug can penetrate to the site of pain production in the ischæmic muscle.

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There is thus no doubt that intravenous procaine can relieve pain by a central action. This does not exclude the possibility of a peripheral action as well, but the latter component is likely to be very small, since extreme dilution of the procaine will have taken place by the time it reaches the affected part. In our experiments procaine analgesia was accompanied by side-effects such as giddiness, light-headedness, nystagmus, and a sensation of respiratory depression.

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Thiopentone has also been shown to exert an analgesic effect on ischæmic muscle pain. Thus 100 mg. of sodium thiopentone injected intravenously in 15 sec. produced relief of pain generally comparable to that produced by 30–40% nitrous oxide. The results in four persons were as follows:

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None of the persons lost consciousness with this dose, but such side-effects as drowsiness, giddiness, a feeling of remoteness, and confusion were well marked, which may have impaired judgment of the results.

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The complicated cases in the treated group had a rather longer average duration of fever than those in the control group.

CONCLUSION

Our failure to reduce the incidence of chest complications may be explained in one of two ways. First, bacterial infection may have nothing to do with the production of the sticky phlegm which often blocks the air-tubes after operation. Or, secondly, and perhaps more likely, the influence of infection may be important, but a penicillin-resistant flora may be no more desirable—indeed may be more dangerous—than the natural one.

We wish to thank Prof. Ian Aird, Mr. M. R. Ewing, and Prof. Lord Stamp for supervising this inquiry, and Mr. J. W. [illegible] for his help with the statistics. Oxycillin atomisers were lent by Messrs. Oxygenaire Ltd.

TUBERCULOUS MASTOIDITIS TREATED WITH STREPTOMYCIN

REPORT OF A CASE

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TUBERCULOUS infection of the middle-ear cleft is a rare condition, especially in infants; it is often complicated by facial palsy and may be followed by destruction of the labyrinth and by meningitis. The following case was treated by surgery and subsequently with streptomycin.

On Dec. 19, 1947, a female infant, aged 8 weeks, was first seen with seven days' history of right otorrhœa and two days' partial right facial paralysis. There was a profuse and foul-smelling discharge from the right ear; the drum-head was not clearly seen, but there appeared to be a granulation which bled freely when touched with a probe. There was slight postauricular œdema. A well-developed right facial palsy was present, incomplete in the distribution of the lower division of the nerve. A submandibular gland on the right side was enlarged, but no preauricular or postauricular glands were palpable. There were no other abnormal physical signs, except that the spleen was just palpable.

On Dec. 21 the clinical appearance strongly suggested a tuberculous infection, and a cortical mastoidectomy was performed under basal paraldehyde and local infiltration with procaine. The skin and periosteum were œdematous; when the cortex was opened a large cavity full of foul-smelling necrotic material was found. After curetting, the lateral sinus plate, horizontal semicircular canal, and incus were clearly seen. The wound was closed, and a small inferior rubber drain was left in situ for thirty-six hours. Penicillin was given systemically, 25,000 units eight-hourly, until Dec. 23.

Streptomycin therapy was begun on Feb. 6, 1948, and continued for thirteen weeks. The dosage was calculated on the basis of 0·02 g. per lb. body-weight daily and given twelve-hourly by intramuscular injection together with 1 ml. of 2·5% procaine (Feldman et al. 1947, Cathie 1948, Medical Research Council 1948). The total dosage was [illegible]5 g. There was no evidence of toxic symptoms referable to the streptomycin at any time.

During the postoperative period the local treatment consisted of mopping out the meatus, but during February and March the meatus was syringed twice daily with hypertonic saline and eusol. The postauricular incision broke down, and a discharge persisted until the middle of March, when it healed for about three weeks. It then discharged again until the end of April, since when the wound has been soundly healed, but the scar is depressed.

The meatal discharge remained offensive and profuse until the third week in March, when it became gradually less, and it dried up completely a month later.

An improvement in the facial paralysis was first noted about the middle of January, and by the second week in March recovery was complete.

Histology.—Prof. H. A. Magnus reported on Dec. 22, 1947, that sections of material from the antrum showed granulation tissue and some areas of caseous necrosis, but no tubercle follicles, and that sections stained by the Ziehl-Neelsen method showed several groups of undoubted tubercle bacilli, the histological appearances of this material being those of a purely exudative lesion.

Bacteriology.—Culture of acid-fast bacilli found in the specimen of pus from the antrim on Dec. 22, 1947, yielded a human str. in of *Myco. tuberculosis.*

Tuberculin Skin tests.—Tuberculin-jelly test negative on Dec. 29, 1947; Mantoux test 1/100,000 negative on Jan. 5, 1948, and 1/10,000 negative on Jan. 8; tuberculin-jelly test positive on Jan. 10.

Blood.—On Jan. 2 a blood-count showed 2,960,000 red cells per c.mm., Hb 58%. The erythrocyte-sedimentation rate (E.S.R.) was 27 mm. in the first hour (Payne). Two transfusions of 50 ml. of group-O Rh-negative blood were given via the internal jugular vein at this time.

Blood-streptomycin Levels.—On Feb. 10, the blood level eight hours after injection was 4 units per ml.; ten hours after injection, 2 units per ml.; and twelve hours after injection, less than 0·25 unit per ml.

Cerebrospinal Fluid (C.S.F.).—Cells 4 per c.mm., protein 30 mg. and chlorides 760 mg. per 100 ml., culture sterile.

Radiograms of chest on Dec. 19, 1947, and May 18, 1948, were clear.

Urine.—No abnormality was found at any time.

Subsequent weekly blood, urine, and C.S.F. examinations were made until the patient's discharge from hospital, when the E.S.R. was 14 mm. in the first hour, Hb 62%. The C.S.F. findings remained constant throughout.

From the past history no source of infection could be ascertained; the child had been born in hospital and subsequently nursed at home. No mouth-to-mouth artificial respiration had been used, and initial feeding was by the breast, later supplemented with a half-cream dried milk. All chest radiograms of immediate contacts were clear.

DISCUSSION

The case is interesting in that streptomycin was used after a cortical mastoidectomy, with apparent resolution in fourteen weeks. Souper (1933) recorded 36 cases of tuberculous mastoiditis in which 17 of the patients were aged under 6 months, and 29 under 12 months, with a mortality of 59% among the first 24 cases treated by radical mastoidectomy. The remainder, treated by a Wilde's incision, a cortical mastoidectomy, or a radical mastoidectomy without a plastic meatal procedure, had a mortality of 36%. This latter and more conservative approach was also advocated by Ormerod (1939), who pointed out that, in acute cases of mastoiditis diagnosed preoperatively as tuberculous, it is usually wise to perform a cortical mastoidectomy and to await healing, which generally takes place after several weeks' dressing. It is also advised that the postauricular wound should be left open and packed with gauze through the meatus and the wound. The radical operation can then be performed if the discharge persists. There also seems to be a place for Wilde's incision in severely ill children with a subperiosteal abscess, to precede the opening of the mastoid.

It remains to be seen whether streptomycin therapy will altogether obviate the need for radical exenteration in these cases and will reduce the high mortality of this condition.

Our thanks are due to Dr. Wilfrid Sheldon and Mr. W. I. Daggett for permission to publish this case, and to Dr. I. A. B. Cathie for the supply of streptomycin, advice regarding dosage, and estimations of blood-streptomycin levels.

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SUMMARY

A method of testing analgesics in man has been studied in four normal persons. Maintained ischæmic muscular pain has been produced in the forearm and assessed subjectively in grades of intensity of 1–10 units (1 = very slight, 10 = intolerable pain).

The drugs tested were injected intravenously when moderate pain (4–5 units) was present. Effective doses produced rapid transient relief.

The best method of comparing the potency of different analgesics was to find the smallest dose of each drug which reduced pain of 4–5 units' intensity. The comparative effects of morphine, pethidine, physeptone, and C.B.11 are reported. Changes in threshold doses with time are discussed.

The actions of nitrous oxide and cyclopropane on ischæmic muscular pain are described.

The analgesic effects of intravenous procaine have been shown to be mainly of central origin.

Thiopentone, benadryl, neoantergan, antistin, and tetraethylammonium bromide have definite analgesic actions but are on the whole much weaker than the recognised analgesics.

Individual variations with regard to analgesic action and the development of side-effects are discussed.

We wish to thank Mr. R. M. L. Dry and Mr. J. W. Markham for their most willing coöperation and patience in this investigation; Dr. F. Prescott and Dr. R. H. Thorp, of the Wellcome Foundation Ltd., for their help in providing supplies of physeptone, Hoechst 10582, and isoamidone; Glaxo Laboratories Ltd. for supplies of C.B.11; Dr. H. O. Schild for a sample of pure benadryl; and Dr. A. S. V. Burgen for helpful criticisms.

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NEBULISED PENICILLIN AND POST-OPERATIVE PULMONARY COMPLICATIONS

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M.A., M.B. Camb.

E. A. Spriggs
B.M. Oxfd, M.R.C.P.

From the Postgraduate Medical School of London

In thoracic operations for suppuration of the lung the use of penicillin inhalations to reduce the incidence of postoperative pulmonary collapse proved disappointing.[1] We report here the results of a similar use of penicillin in the rather different circumstances of abdominal surgery.

The patients were adults undergoing abdominal operations, including herniorrhaphy. Each was examined at least a day before operation and assessed as a "chest risk"—good, moderate, or bad. In each of these three categories alternate patients were treated with nebulised penicillin, the remainder serving as controls.

In the treated group at least three inhalations of penicillin (100,000 units each) were given in the 24 hours before operation. Further doses were given the evening after operation and the next morning. Since it was found t penicillin-sensitive organisms usually took 48 hours more, after inhalations were stopped, to return to respiratory tract, and since in most cases pulmon collapse has its origin in the first 24 hours after operati this dosage of penicillin was thought sufficient a minimum. Most of the patients, however, for reas sometimes unconnected with the main experim received longer courses, either starting earlier or finish later, or both.

Bacteriological examinations were made on sw from the nose and throat, and on sputum when it c be obtained. Effective administration of penicillin, reflected in the respiratory flora, was proved for e case in the treated group.

Patients were examined daily, after operation, by same observer (E. A. S.) in all the cases. Clinical evide of pulmonary collapse or consolidation, confirmed radiology, was the criterion of complication. Pulmo embolism, uncommon in the first week after operat was outside the scope of the inquiry.

RESULTS

Bacteriology

In the penicillin-treated group the bacteriolo changes followed a standard pattern. The first sv taken after the start of inhalations gave a smaller growth than the initial swabs. On the day of opera the upper respiratory tract was often superficially al sterile, and any penicillin-sensitive pathogens which originally been demonstrated—e.g., β-hæmolytic stre cocci, *Strep. pneumoniæ*, *Staph. aureus*—could no lo be grown.

After two days' inhalations the multiplicatio penicillin-resistant bacteria was usually advanced. T were predominantly organisms of the coli-aerog group, usually in pure culture, but sometimes associ with *Hæmophilus influenzæ* or other resistant bact Return of penicillin-sensitive organisms while inhalations continued was not observed. Multiplicat of neisseria strains sometimes either preceded or acco panied the appearance of coliforms, but these were relatively insensitive to penicillin, requir concentration of 4–6 units per ml. for inhibition in vi

Similar changes were observed in those cases of treated group which had pulmonary complications.

Complications

The incidence of pulmonary complications was follows:

	Treated	*Controls*	*Total*
Complications..	10	6	16
No complications	34	38	72
Total	44	44	88

It will be seen that chest complications occurred m frequently in the treated group than in the controls, the difference is not statistically significant.

If the administration of nebulised penicillin, amon much larger series of cases, were to reduce the numbe chest complications to half, the expected incidence complications in 88 cases would be as follows:

	Treated	*Controls*	*Total*
Complications..	$5\cdot\dot{3}$	$10\cdot\dot{6}$	16
No complications	$38\cdot\dot{6}$	$33\cdot\dot{3}$	72
Total	44·0	44·0	88

A deviation as large as that of the observed inciden from the expected incidence would occur by chance o once in 150 times ($\chi^2 = 7{\cdot}40$; $n = 1$). It is therefo understood that nebulised penicillin, as administered this series, would not substantially reduce the incide of chest complications.

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[1] Findlay, C. W. jun., Sweet, R. H. *J. thorac. Surg.* 1947, **16**, 81.

[2] Stringer, P. *Lancet*, 1947, i, 289.

[illegible] attacks about every hour, precipitated by speaking or eating. He had one brother who had also had trigeminal neuralgia.

He showed no abnormal physical signs apart from the fact that he was obviously having periodic severe pain, for which he got relief by rubbing his face to the extent of producing conjunctivitis on this side. He was generally [illegible].

Under a course of injections of cuprelone the patient [illegible] improved (fig. 2); he was discharged having lost his pain and now twelve months later he has remained more or less free from pain.

Case 3.—A housewife, aged 66, had had severe intermittent pain of the right side of the face for 12 years, brought on by eating, washing, removing the denture, or talking. Occasionally the attacks appeared to arise spontaneously. The present attack began 6 weeks before, and had continued up to admission to hospital in July, 1947. Through the whole course of her illness the patient had never had a remission of pain for more than 3 months.

There were no abnormal physical signs, except a slight loss of weight owing to the difficulty in eating. There was a definite trigger point for production of pain on the upper lip at the junction of the lip with the nostril.

The patient improved with a course of cuprelone injections (fig. 3), and was discharged free from pain. A year later she wrote that she had never felt better.

Case 4.—A housewife, aged 71, had had severe pain in the [illegible] side of the face 4 months before admission to hospital in [illegible] 1947, followed by severe attacks of burning pain in the [illegible] side of the face, typical of trigeminal neuralgia and brought on by rubbing, touching, and eating. In her previous history, the only important factor was that she had had gout.

No abnormal physical signs were noted, and the patient was not so severe a case as the three previous ones. Her general condition was good.

After a course of cuprelone injections (fig. 4) she was discharged free from pain: 3 months later her doctor wrote that she had had a relapse, which had responded to a sedative mixture.

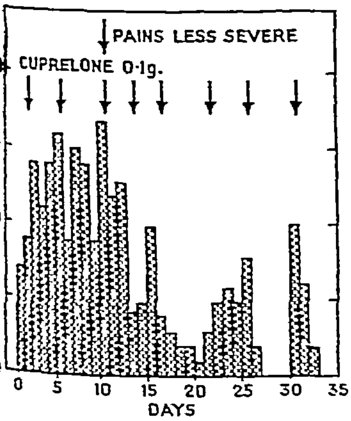


Fig. 3.—Trigeminal pain treated with a total dosage of 0·8 g. of cuprelone in 33 days (case 3).

DISCUSSION

In these four cases the injection of cuprelone was followed by relief of pain: in some cases single injections of 50 or 100 mg. seemed satisfactory; in others more distinct relief followed a course of injections of 800 mg. in 6 weeks. All the patients were satisfied that the injections had materially lessened the number of their attacks and the severity of their pain. In a case of malignant bone disease cuprelone did not relieve the pain.

In case 1 an injection of distilled water had no effect on the pain, though the patient was unaware that there had been any change in the injection. In this case cuprelone relieved the pain as satisfactorily as did trilene. The dosage has been varied experimentally, and a higher dosage may possibly be given without ill effect. Case 1 showed severe paræsthesiæ in the legs in the middle of the course, and this may have been caused by copper. There has been no evidence of leucopenia or of renal damage. Of these four patients three remain well 6 months later, but one has relapsed.

Cuprelone has been tried in nine other cases. In one it appeared to have no effect, and in two the effect was doubtful, but in six the result appears to have been satisfactory, and it is felt that the action of cuprelone is worth further study. It may have specific effects on the trigeminal-nerve nucleus, as triethylene and stilbamidine appear to have. If this is true, a modification of the drug in structure and dosage may play a useful part in the relief of a painful malady.

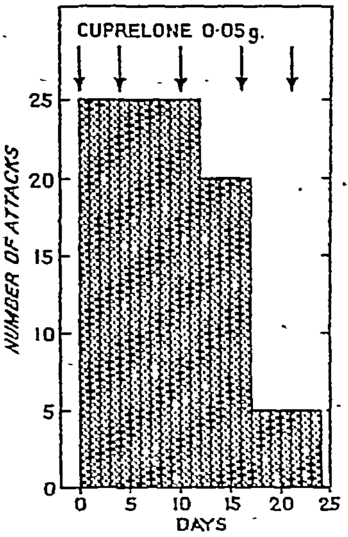


Fig. 4.—Trigeminal pain treated with a total dosage of 0·25 g. of cuprelone in 30 days (case 4).

SUMMARY

Intravenous injections of cuprelone have been given in thirteen cases of trigeminal pain, and in some of them the pain was relieved.

Toxic effects were negligible.

Owing to psychological factors, the results must be interpreted cautiously.

Cuprelone may possibly act directly on the trigeminal nucleus.

My thanks are due to Bayer Products Ltd. for supplies of this drug.

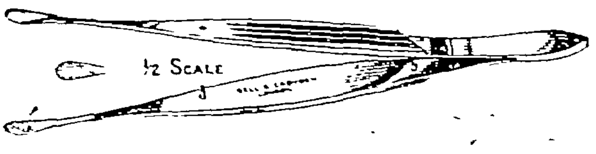
A. M. G. CAMPBELL
D.M. Oxfd, M.R.C.P.

Bristol Royal Infirmary.

New Inventions

DISSECTING FORCEPS WITH SPATULATE ENDS

THIS dissecting non-toothed forceps is a modification of McIndoe's forceps and is adapted from the patterns commonly in use in the United States. It is useful for holding intestines during anastomosis and also in suturing the various layers of the abdominal wall. As the cross-serrated spatula-like ends do not injure the tissues when used during dissection or suturing, it has many advantages over the ordinary forceps employed today.



The forceps has been carefully made to my instructions by John Bell & Croyden, London.

RODNEY MAINGOT
F.R.C.S.
Surgeon to the Royal Free Hospital and the Southend General Hospital.

"... The great French clinicians of the nineteenth century taught, as a matter of course, that there were two stages in the development of alcoholic cirrhosis. The first, in which the liver was enlarged and infiltrated with fat, they called steatosis of the liver: the second, in which the organ was small and fibrotic, they termed portal, atrophic, or Lænnec's cirrhosis. For some reason this knowledge did not take root and withered under the sterilising error which conceived hepatic fibrosis as a single entity—cirrhosis of the liver—instead of the similar end result of different initial injuries."
—Prof. H. P. HIMSWORTH, *Science Progress*, 1948, 36, 577.

Preliminary Communication

TRIGEMINAL NEURALGIA TREATED WITH CUPRELONE

IN the late war the Germans produced a copper compound of low toxicity to serve as a substitute for gold salts. This substance, cuproallyl-thiourea-sodium benzoate, which contains 19% copper, is now manufactured in this country under the name of 'Cuprelone' and is obtainable in dry ampoules containing 10 to 100 mg. The powder is dissolved in sterile distilled water for intravenous injection. The salt is secreted in the liver and most tissues show an increased copper content after its administration. Excretion is slow and may last two months.

van Ravesteyn[1] gave the salt intravenously in 100 mg. doses (19 mg. of copper) and produced a rise in the blood-copper level for two hours after the injection. Probably all the extra copper is excreted in the next two or three weeks.

The observations made by workers that copper was useful in preventing swayback, a demyelinating disease of sheep, led Campbell et al.[2] to try copper sulphate in the treatment of disseminated sclerosis, without success. Copper sulphate had the disadvantage of being a gastric irritant and in some cases it caused vomiting and had to be discontinued. The introduction of cuprelone offered an organic copper salt which was free from this disadvantage; so it has been tried in disseminated sclerosis. Although there has been little evidence of improvement in this disease, it was noted in a patient with disseminated sclerosis who also had severe trigeminal pain, that the pain was alleviated immediately after an injection of cuprelone.

On the basis of this observation cuprelone has been tried in a few cases of classical trigeminal neuralgia, and in some of them there appeared to be a decrease in the number of attacks and a lessening of pain. Trigeminal neuralgia normally waxes and wanes and may ofte improve on admission to hospital with rest in bed; but even when allowances have been made for this, it i considered that some cases responded satisfactorily t intravenous cuprelone. The cases have been assesse by charting the number of attacks of pain agains the time in days (figs. 1–4). This shows a response bot to a series of injections and to single injections. Th results, though varied, are thought worthy of publicatio

CASE-RECORDS

Case 1.—A male casemaker, aged 43, first attended t Bristol Royal Infirmary in January, 1947, with severe shooti pain in the left side of the face and lower gums. He had first noted severe pain when washing his face, and this had persisted ever since, with anything up to 30 attacks a day, precipitated by eating, washing, or speaking. The patient appeared to have a typical trigeminal neuralgia, and he was obviously frightened of speaking and moving the lower jaw. Ten years earlier he had suddenly lo the vision in his right eye; this had lasted 6 weeks and th completely recovered. For $3^1/_2$ years he had noted increasin stiffness in both legs and had been treated by his doctor fo rheumatism. It was only when the severe pain in the fa began that he was forced to attend hospital.

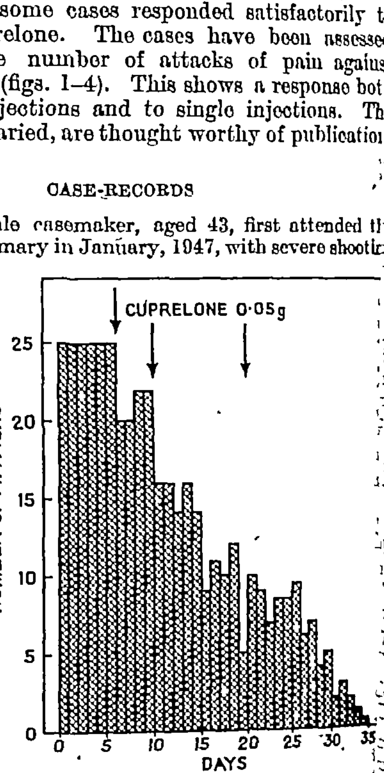


Fig. 2—Trigeminal pain treated with a total do of 0·15 g. of cuprelone in 35 days (case 2).

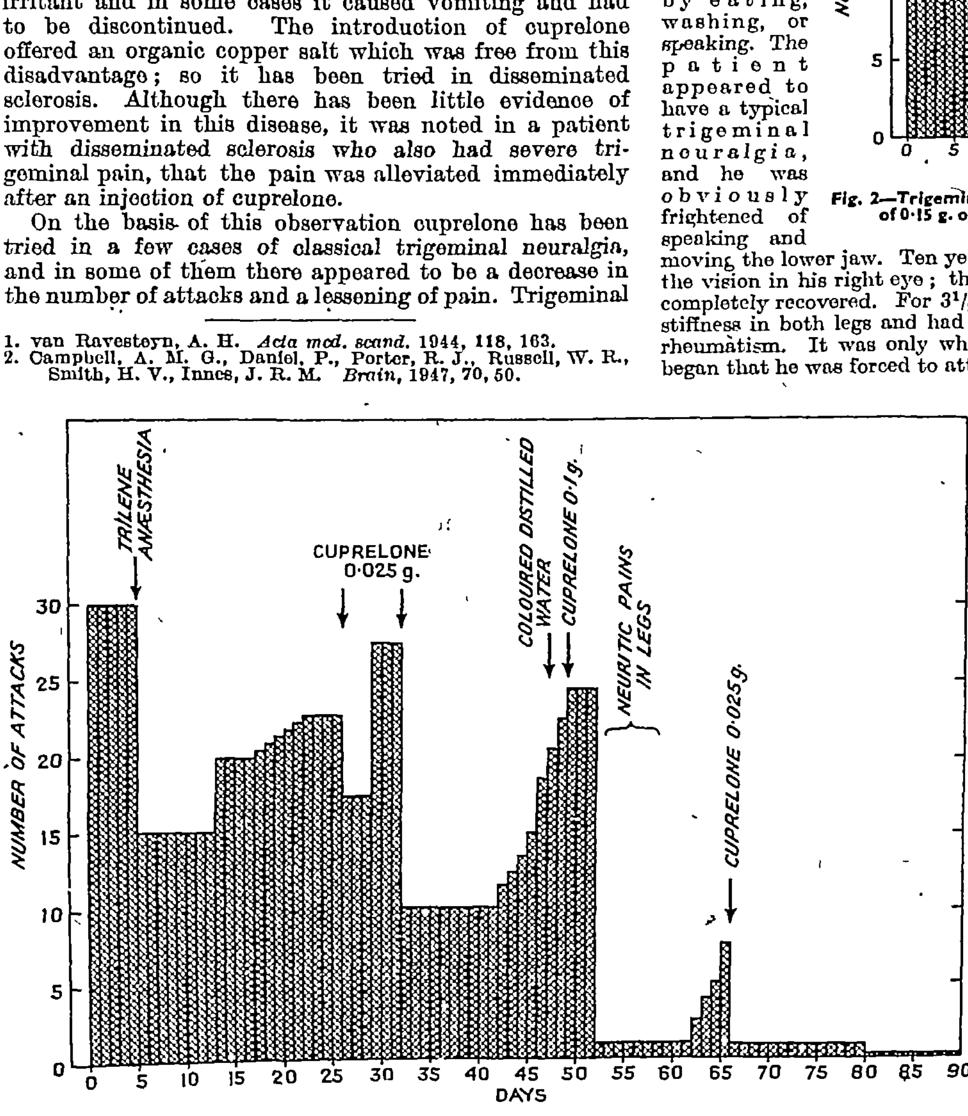


Fig. 1—Trigeminal pain treated with a total dosage of 0·175 g. of cuprelone in 90 days (case 1).

He had nystagmus o looking to the right, an there was spasticity of bo legs, with increased reflexe plantar reflexes bein equivocal on the left an extensor on the righ Disseminated sclerosis w diagnosed, and the trigem nal pain was considered t be due to a plaque involvin the fifth-nerve nucleus.

Fig. 1 shows that th patient reacted satisfactoril to 'Trilene' and later t cuprelone injection Towards the end of th treatment he had para thesiæ in the legs, probabl a result of the copper inje tions. Apart from this h urine, blood-count, and cere brospinal fluid remained normal throughout treat ment. Follow-up shows tha he has had no return o pain in the year and a hal since treatment.

Case 2.—A baker, aged 79, had had severe pain in the right side of the face for 30 years, with periods of freedom, but becomin more severe lately. In April, 1947, he was

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1. van Ravesteyn, A. H. *Acta med. scand.* 1944, 118, 163.
2. Campbell, A. M. G., Daniel, P., Porter, R. J., Russell, W. R., Smith, H. V., Innes, J. R. M. *Brain*, 1947, 70, 50.

THE LANCET

LONDON: SATURDAY, OCT. 30, 1948

Blood for Transfusion

The National Blood Transfusion Service has lately been criticised in our correspondence columns on the ground of failure in its primary task, which is to supply blood in sufficient quantities, and of the right groups, to hospitals and other users. Like most other organisations at the present time, the service is of course capable of improvement; and there have been big difficulties to overcome in many areas. But there are already considerable achievements to its credit, and the collection of blood has much improved, especially in certain areas For example, in the area covered by the two London blood-supply depots 36,522 donors were bled in the second quarter of this year, compared with 22,366 in the last quarter of 1946; and for the whole of England and Wales the figure rose from 65,532 to 98,055.

The panel of donors in England and Wales on June 30, 1948, showed an increase of about 110,000 over the figure for Dec. 31, 1946, and represented some 75% of the estimated optimum, assuming that donors are bled only twice a year. Certainly many more donors are needed; but it seems improbable that the methods used in France, as described by Dr. Piney, would meet with much success in this country. The issue of chits to enable donors to buy extra rations amounts almost to payment; and, as Dr. Popham points out, this form of inducement might have to be replaced, when rationing ceases, by a cash equivalent, which would finally kill the voluntary spirit. Moreover, experience suggests that most of those who say that lack of good food prevents their giving blood—and this reason is rarely given—are in fact people who are already receiving extra rations by reason of their employment: the excuse is but seldom heard from the overworked and comparatively underfed housewife. The only tangible reward at present received by the donor is a neat booklet—rather like the pre-war driving licence—and a certificate for each donation. In addition he is in future to be issued with special badges after ten donations, after twenty-five, and after fifty. But it is questionable whether these badges will be much displayed, for most donors are self-effacing and unemotional about their contribution; and the appeal to sentiment, used with considerable success during the war, is now best replaced by a straightforward account of what blood-transfusion can do, and to what extent the hospitals rely on the help of local donors. To this end the National Blood Transfusion Service has lately begun to issue to all donors, when they give blood, a small illustrated brochure setting out the facts and appealing for increased support The aim has always been to make the giving of blood an informal occasion; sessions, whether held in hospital wards, village halls, or factory canteens, have the atmosphere of a tea-party. More can and should be done on these lines. Surely it is high time that A.R.P. stretchers, wooden trestles, and drab Army blankets were replaced by equipment more pleasing to the eye and more fitting to a permanent peace-time service. The time has come, too, for the nurses and drivers to be given a distinctive uniform.

Though the demand for blood would doubtless be greater if there were unlimited supplies, the National Blood Transfusion Service can claim at least to be meeting essential needs, since the number of bottles collected during the June quarter exceeded the number used by almost 21,000. Most of this excess was made into dried plasma, and a large proportion was "carried forward," for issue during the next quarter. Any shortages, therefore, are likely to be temporary and local, and particularly of group-O blood; for more than half the blood issued is of this group. To relieve this difficulty, hospitals might well improve their arrangements for blood-grouping, so that wherever possible homologous-group transfusions were given. It might be feasible to determine the ABO group and Rh type of every patient on admission. so that only a cross-match would be required when blood was given; and group-O Rh-negative blood, which is apt to be scarce, could be reserved for patients who must have it. The success that regional blood-transfusion officers have had in persuading hospitals to use homologous blood is evident from the fact that in the past twelve months the proportion of group-O blood has fallen from 60 to 53% of the total issued, while the proportion of Rh-negative blood has risen from 4·5 to 9·2% of the total. One of the aims of the service since mid-1946 has been to encourage, and (where necessary and possible) to perform, Rh tests on women before childbirth; and since the last quarter of 1946 the number of tests made quarterly by the service has risen from some 26,000 to over 56,000—an increase of about 112%. Another aim has been to encourage the use of concentrated or packed red cells for the treatment of anæmias, and between the last quarter of 1946 and the second quarter of 1948 the blood employed for these preparations rose from 1469 to 3452 bottles—an increase of 135%.

In the United States and Canada relatively more blood is used for transfusion than in this country, and no doubt the demand here will grow. As this happens, it will be increasingly important for consultants and housemen to see that blood is used only when it is really needed. There is undoubtedly some wastage from indiscriminate transfusion, blood being given without sufficient indication that it may really benefit the patient Even more wasteful is the practice of ordering an unreasonable number of bottles, to be cross-matched and set aside against the patient's later need; often these bottles are held in reserve until the expiry date and are never used. Both these causes of waste would be largely eliminated if replacement involved something more difficult than a telephone call to the nearest regional transfusion centre, and if all those who ordered transfusion remembered that they are handling a gift made at sacrifice of time and energy. Dr. Popham in our issue of Sept. 25 urged that more should be done to

Reviews of Books

Cardiography

WILLIAM EVANS, M.D., D.SC., F.R.C.P., physician to the cardiac department, London Hospital. London: Butterworth. 1948. Pp. 132. 25*s.*

Dr. Evans's book is in two parts, the first dealing with the common abnormalities of the electrocardiogram and the second with records of heart sounds. The electrocardiograms illustrating the first section are accompanied by a minimum of text and little or no theory as to the mode of production of cardiographic changes, but the student who applies himself to the tracings and description will gain a first-class introduction to the subject. The second section, on phonocardiography, is very largely the original work of the author, who has done much to clarify and advance this aspect of cardiology. The special value of this method is in the diagnosis of some valve lesions, and, according to Evans, in its ability to distinguish the innocent from the significant murmur, and to classify added heart sounds. The subject is still in an early stage of development, but this account is the clearest and most rational we have seen. The conclusions drawn are based on very extensive observations, and whether or not they are confirmed by further investigations they will certainly prove a valuable stimulus to further work.

The records illustrating both sections of the book are nearly all of flawless quality.

Recent Advances in Surgery

(3rd ed.) HAROLD C. EDWARDS, O.B.E., M.S., F.R.C.S., surgeon and lecturer in surgery, Kings College Hospital London. London: J. & A. Churchill. 1948. Pp. 437. 24*s.*

NEARLY twenty years have passed since the second edition of this book was published, and Mr. Edwards must have found it hard to select the subjects for his new one. His choice will be generally acceptable. Possibly a more satisfying treatment would have been to cut down the number of subjects and go into them a little more deeply, but the student preparing for an examination will no doubt prefer the arrangement as it is. The alimentary tract claims the largest section of the book and is well covered. In addition to this section, and a preliminary chapter on general subjects including the healing of wounds and fluid balance, Mr. Edwards himself has been responsible for a section on diseases of blood-vessels and a miscellaneous one dealing among other things with the thymus and the prostate. Three other authorities contribute chapters on the more specialised branches of surgery: Mr. R. C. Brock on the thorax (confining himself to the surgery of the heart and bronchial carcinoma); Mr. D. W. C. Northfield on neurosurgery; and Sir Stanford Cade on the radiotherapy of malignant disease. Altogether this is a most useful book, not only for the student but also for the busy practising surgeon who must keep up to date.

Practical Bacteriology, Hematology, and Parasitology

E. R. STITT, M.D., PH.M., SC.D., LL.D., surgeon-general, U.S. Navy, retd; PAUL W. CLOUGH, M.D., physician-in-charge, diagnostic clinic, Johns Hopkins Hospital; SARAH E. BRANHAM, M.D., PH.D., SC.D., senior bacteriologist, National Institute of Health; and contributors. London: H. K. Lewis. 1948. Pp. 991. 50*s.*

IT is ten years since the previous edition of this well-known practical textbook appeared and it is not surprising that in some respects this tenth edition is almost a new book. Still of reasonable size and price, it remains a remarkable compendium of facts and figures that the clinical pathologist and physician need to know but cannot always carry in their heads. The new bacteriology section contains many good tabular summaries. The nomenclature adopted is that of the 6th edition of Bergey's Manual, except in the case of the salmonellas. Up-to-date techniques, like the yolk-sac material method for distinguishing the different rickettsiæ, are fully represented; and it may be noted that infective hepatitis and homologous serum jaundice are placed among the filtrable virus diseases. The section on medical mycology is a well-illustrated account of a group of conditions some of which are rare in this country. Hæmatological method are well described, and the authors are decided abou which they think best: the modified Neubauer ruling preferred for hæmocytometry, and either a photo-electr colorimeter or a Sahli instrument for hæmoglobinometr Most American textbooks have given up Haldane method now. The illustrations, except for the plate showing the blood picture of monocytic leukæmia, are not very good, and the explanation of the hæmorrhagic diseases seriously out of date.

The tropical and parasitology sections, and those th deal with insects, poisonous snakes, and fish, are as go as before, and there are some first-class plates of malari parasites. A new section on vitamins is provided; an a useful table sets out the variation of some importa constituents of the blood—such as urea, sodium, an calcium—in various diseases. This is a welcome revisi well able to take the place of its predecessor.

Post-Mortem Appearances (5th ed. London: Oxfo University Press. 1948. Pp. 308. 8*s.* 6*d.*).—This practic little pocket-book has been extensively and well revised maintain its usefulness as a guide to students and those havi to perform autopsies without advice and assistance. Dr. Ja Ross is as concise, lucid, sound, and practical as ever, and h book contains a remarkable amount of information couch in good terse English.

An Apple a Day (London: Cassell. 1948. Pp. 1 10*s.* 6*d.*).—Those who have read *Go to the Country* and ha discovered Dr. Philip Gosse's humour and joy in natu sights and sounds will be prepared for this successor. narrates his professional success and non-success with equ gusto. (His habit of taking a long holiday after an uneq contest with his professional examiners must be noted, b whether this was of a consolatory character, or, in his mi a reward for work well done, he does not specify.) The bo as a whole is an odyssey of adventure, taking us all over t world; but it is also full of wise sayings and bears the star of a keenly observant outlook. Dr. Gosse notes and commen tellingly on many apparent trivialities in life which m of us take for granted. There is a certain carefree irrespon bility about him which gives his book an atmosphere a charm of its own.

The Way to Natural Childbirth (Edinburgh: E. & Livingstone. 1948. Pp. 124. 7*s.* 6*d.*).—Since Dr. Gr Dick Read published *Natural Childbirth* over fifteen y ago a new school of obstetrics has arisen. It is healthy th the technique of an unorthodox clinical method should b elaborated by enthusiastic disciples, and Mrs. Helen Heardma is evidently one of them. She practises and writes a physiotherapist who has become interested in obstetrics, an this approach carries a risk of emphasis on a meticulo régime of physical preparation. In their written form, h instructions have an austerity which would disturb the sens tive minds of many expectant mothers; while some of th illustrations would certainly upset all anatomists. Neverthele the book should be useful to the teacher, and especially th physiotherapist of an obstetric unit; for, though it is large a synopsis of the work of others, it also describes the author own experience, both personal and professional.

Malaria Control by Coastal Swamp Drainage in We Africa (London: Ross Institute of Tropical Hygiene. 194 Pp. 97.).—Before and during the early days of the war, Apap in the urban area of Lagos was notoriously malarious. vessel making a stay of only one night alongside Apap wharf would, within a couple of weeks, have many of its crew down with fever, and 80% of all ranks of an anti-aircraf battery stationed there in 1942 contracted malaria within thre months of their arrival. Extensive swamp-drainage scheme and mosquito control by engineering methods were instituted by the Services, and matters began to improve. Within comparatively short time malaria had ceased to be an almost invariable sequel to a visit to the area, and in a year or two it became relatively rare. In this small volume Dr. A. B. Gilroy, now principal of the India branch of the Ross Institute, gives an account of the problems confronted and of the methods whereby this very considerable achievement wa reached. It is well illustrated by lively diagrams, plan drawings, and fine photogravure plates, and will be valuable to all concerned with like problems.

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At the risk of over-simplification, we may say that many features of infection specificity probably depend on whether food is both available and accessible to the parasite. If an innkeeper wants to offer true hospitality to a fastidious guest of unusual proportions he will see to it that the guest's favourite meal is on the table, but he will not think his duty discharged until he has provided a chair of a size and shape that will allow his guest to reach the table in comfort. Nor, while his guest is eating, will he fill the room with stick-at-nothing ruffians who make no secret of their desire for a square meal of the kind on the table. If the establishment fails in such matters, the innkeeper need not expect his guest to stay, and still less to call again, recommend the place to his friends, or enjoin his children and grandchildren to confer their exclusive patronage on the hostelry in memory of the services afforded him.

Return to Philanthropy?

It is presumably inevitable that with our advance towards social security, sponsored by the State, some of the light should seem to fade from voluntary [illegible]. Now that we have attained to social insurance [illegible], and so much else, the giant evils of the past [illegible] to look less formidable, and many of those engaged in voluntary effort may even feel a little [illegible]. By contrast with the enthusiastic gatherings of the hospital contributory scheme of a decade ago, the meetings of a regional board may seem to lack the old zest. Yet, at least in the National Health Service, the volunteer has opportunities of usefulness as great as any in former days. And we know that loneliness and failure and misery will still demand help of many kinds, despite all the State can do.

Into this field Lord BEVERIDGE has moved in his latest report entitled *Voluntary Action.*[1] Having been reluctant to see the approved societies by-passed in the administrative machinery of social security, he has now collected a group of helpers and has produced a readable survey, not only of mutual insurance in all its forms, but also of the much wider subject of philanthropy today as it passes from the old world into the new. The first section of his inquiry is concerned with the motive of mutual aid, mainly as illustrated by the history of the friendly societies. He believes that there will still be a large scope for insurance above the minimum: it is likely that the societies will find a strong desire for higher benefits in sickness, above what the State gives, and especially during short periods of incapacity. A long section entitled "The philanthropic motive in action" traces the controversy between ARTHUR HOBHOUSE and JOHN STUART MILL on the reconciling of testators' wishes with the public interest. HOBHOUSE held that the public, in dealing with charitable trusts, must have the right to decide the particular use to which a testator's benefactions are to be put, and that there must always be "a living and reasonable" owner of property to manage it according to the wants of mankind. Taking HOBHOUSE's view as his criterion, Lord BEVERIDGE passes in review the work of the half-dozen great general trusts—the Nuffield Foundation, the Pilgrim Trust, and the others, and, in its slightly different category, King Edward's Hospital Fund for London. These trusts fulfil the necessary conditions, he says. They earn his approval; and indeed what other verdict could possibly have been given? But when he comes to deal with the older and numerically much larger group of miscellaneous charities he strikes a different note. The time has come, he thinks, when the mild and legalistic approach embodied in the powers of the Charity Commissions should be replaced by a much more radical plan. Might not many of the older charities be swept into the net and redesigned to meet current needs? Definite recommendations are made. The appropriate authority should have power, with the consent of the charity concerned: (1) at any time to make a scheme for its administration on the cy-près principle; (2) after fifty years to make a scheme for the use of gifts, within the broad category of the original gift; and (3) after a hundred years to make a scheme for the use of the gift for any charitable purpose which may seem expedient. In discussing the lacunæ of a "social service State" Lord BEVERIDGE rightly gives prominence to the needs of age—housing and special homes—and the need for a new approach in the medical treatment of the aged. The British Medical Association committee's report is quoted with approval, with the emphasis on geriatric departments and the possibility of discharge of many of the patients to appropriate accommodation outside the hospital service. "The picture presented in this chapter is a grim one. It is a picture of unhappiness of many different kinds, with relieving agencies working against odds. The unhappiness is not due primarily to want of money; it has not been, and will not be, remedied by redistribution of money." Two practical conclusions emerge: first there must be adequate diversion of physical resources, and secondly the voluntary agencies must have the material resources to enable them to do their work. How they are to obtain these resources in the changed economic and social conditions is "one of the critical problems of the future."

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A GOOD understanding of the pathology of infection cannot be gained without studying the part played by the host. In a natural desire to exploit new methods of examining the physiology and biochemistry of bacteria and viruses this has sometimes been forgotten, and we therefore welcome the timely message of Professor WILSON SMITH's presidential address last week to the Royal Society of Medicine's section of comparative medicine. He has rightly redirected attention to the unsolved puzzles of host and tissue specificity in infections. Why, for example, is the leprosy bacillus unable to grow except in man? Why is the Algerian sheep resistant to anthrax while other sheep are susceptible? Why do some people have several colds a year while others escape?

These questions have fascinated their students ever since EHRLICH's brilliant observations, deductions, and guesses started the debate which still continues; and knowledge of them has now reached a stage when a reasonable amount of theorising offers the best chance of designing the crucial experiments required. In broad terms, as WILSON SMITH pointed out, specific associations of infecting agents with species, races, individuals, tissues, or cells depend on whether the host cells can participate in biochemical reactions with the infecting parasite or its products. "Extrinsic" factors may decide or influence the issue: for example, the right or wrong portal of entry; the presence or absence of an essential vector; whether the host's nutrition is good or bad, or his metabolism active or sluggish; whether the host has had previous contact with the infecting agent; and whether his body fluids stimulate or suppress the invader's growth. About some of these factors a fair amount is known, and others are being purposefully investigated. But "intrinsic" factors, intimately connected with cell structure and function, are more difficult to explore, and it is about these that speculation is most required.

To make a start with our guesses, we may profitably consider some of the recent discoveries about viruses. The association between a virus and a host cell it has parasitised is particularly close; indeed the virus cannot grow in nature or in artificial culture unless it is able to enter a living cell. It is of great interest, therefore, to learn that between some viruses and cells specificity of association does not depend on the whole cell or virus but on a particular component. Thus both living and heat-killed influenza virus can agglutinate the red blood-cells of the chick; but the next reaction, elution of the virus from the cell, is not accomplished with heat-killed virus, because this has lost the enzyme required to disintegrate the part of the red cell (the receptor) which holds on to the virus. If red-cell receptors for influenza virus are destroyed by treatment with *Vibrio choleræ* mucinase, the virus cannot be adsorbed to the cell and the cell cannot be infected.[1] It is a fair guess that the transient insusceptibility observed with some viruses may coincide with the stage when the cell, having rid itself of infecting virus and specific receptor in a single act (elution), cannot be reinfected until it has regrown its receptors. Among bacteriophages, which may be accepted as viruses for our argument, specificity is narrowed even to variants of a single strain of bacteria. A culture of bacterial host cells susceptible to lysis may be readily transformed to one in the insusceptible state, and the change may depend on loss of specific cell receptors or on their being masked by new components, as in the loss or gain of an antigen. Inactivated phage, by blocking specific receptors on the host cell, may prevent lysis by active phage whose attachment has been made impossible by the "interference" of the inactivated phage. This perhaps explains how modified viruses may act as specific immunising agents against virulent forms of their own strain, and may sometimes confer insusceptibility on others whose demonstrable relationship is remote. But simple blockage of cell receptors will not explain all we know of bacterial insusceptibility to phages, and LURIA and DELRÜCK supposed that there may be competition among phages for a single key enzyme present in the host cell in such small amount that it may be deviated by even one particle of inactivated phage.

The lifelong resistance to reinfection conferred by some viruses probably depends on continuous carriage of the virus in the host cells and its transmission to daughter cells—a phenomenon well established for lysogenic strains of the bacillus group which transmit phage to cells arising even from their spores. If a similar perfection of cell-virus symbiosis is possible in man, the many unexplained transient fevers of childhood may represent only the acquisition of [illegible] unidentified virus which, when it has settled in [illegible] appropriate place, may have an important part [illegible] play in developing general or specific resistance. We now know that viruses may enter and grow in a cell without causing much or any constitutional disturbance, especially if—as in recurrent herpes—the balance of events is not disturbed by some intercurrent infection or other upsetting event. In addition, viruses show great powers of adaptation if they are given enough opportunity to parasitise a new host or tissue. This was well shown in the gradual adaptation of human influenza to the mouse via the ferret. From the ferret adaptations were also made to the guineapig and rat, and in these species the infections were symptomless. Similarly with rinderpest virus, strains were adapted from oxen to goats and rabbits, and the infectivity for oxen of a strain undergoing goat adaptation was found to depend on the number of goat passages it had undergone—remarkable evidence of the plasticity of the virus and of a quantitative aspect to the process of adaptation.

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45, falling a little to 167,210 in 1946. The apparent repancy between this increase and the downward d of major accidents is probably explained, says the port, by "factors such as more regular employment ing the war years, the incidence of P.A.Y.E., higher s of compensation benefits, a greater tendency to d minor accidents more seriously, and the higher erage age of the employees."

Discussing the growing preoccupation with dust pression, the report cites the South Wales area, here by the end of 1946 almost 600 miles of steel water-pes had been installed underground for this purpose. The report also refers to first-aid arrangements as often atisfactory, usually for the reason that no suitable son is in charge; septic infection of minor injuries— common, though less of a problem than formerly ould be reduced with better equipment and more ly trained personnel. *In point of fact* a scheme for e erection and expert staffing of treatment centres at es was initiated towards the end of the period under iew. The concession, arranged in 1944, by which ined first-aid workers may administer morphine in ergency, has proved to be a wise one.

STREPTOMYCIN RESISTANCE AND DEPENDENCE

In talking loosely of organisms developing resistance lay ourselves open to a charge of Lamarckism, for resistance is not developed but unmasked. It is now ar that the appearance of strains of tubercle bacilli other organisms resistant to streptomycin results m selection of naturally occurring hereditary variants. hen streptomycin is added to a culture of organisms, ther in the body or in the laboratory, a culture medium formed which is selective for the growth of resistant riants. The facts that these resistant organisms are ly genetically stable and are present only in small ers in a random population support the view that re produced by mutation regardless of the presence drug. But how can we explain that some strains ganisms require streptomycin for growth? Miller Bohnhoff[1] obtained a streptomycin-dependent in of meningococcus, and Paine and Finland[2] e found streptomycin-dependent variants of staphylo-i and coliform organisms. Spendlove and his eagues[3] have described a strain of *Mycobacterium culosis* which grows much better when streptomycin added to the culture medium; this strain was isolated m a patient whose infection progressed rapidly during eptomycin therapy.

The full explanation of streptomycin dependence and stance must necessarily await understanding of the chanism by which the drug exerts its antibacterial ect. Dependence on streptomycin appears to be ch more labile than resistance, but Paine and Finland nt out that dependence and resistance may be closely ated traits. They found that both sensitive and pendent organisms were present in the same pre-minantly dependent colony which appeared after initial exposure of a sensitive strain to the anti-otic. Under appropriate conditions dependent variants ve rise only to sensitive organisms, and the same ncentration of streptomycin that completely inhibited he growth of the parent sensitive strain was necessary r the growth of its dependent variant. If strepto-mycin acts by blocking an essential metabolite or zyme system, then it seems more than coincidence that the concentration of drug which inhibits the sensitive rain should also make for growth of the dependent riant. In the latter the original essential metabolite ay be replaced by some part of the streptomycin molecule which closely resembles it. In the resistant variants an alternative mechanism may function in place of the metabolite or enzyme system that is blocked by streptomycin in the sensitive strain. As Paine and Finland point out, both dependent and resistant variants grow much more slowly than their parent sensitive strain, and this may be why streptomycin-resistance is often not encountered until late in a course of treatment.

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[1] Miller, C. P., Bohnhoff, M. *J. Bact.* 1947, 54, 467.

[2] Paine, T. F., Finland, M. *Ibid*, 1948, 56, 207.

[3] Spendlove, G. A., Cummings, M. M., Fackler, W. B. jun., Michael, M. jun. *Publ. Hlth Rep., Wash.* 1948, 63, 1177.

ASIATICOSIDE IN LEPROSY

THE small umbelliferous plant, called *Centella asiatica*, or Indian pennywort, has been a traditional Indian remedy for leprosy and syphilis. About three years ago French workers in Madagascar reported that asiaticoside, a preparation obtained from the plant, was of some use in human tuberculosis. The drug is a white tasteless crystalline powder, insoluble in water, though it can be made soluble by oxidation with potassium permanganate. No further information on the subject appeared at the time, and we understand that some in-vitro tests of the drug in this country against *Myco. tuberculosis* were disappointing. Two French workers, Boiteau and Saracino,[1] have now reinvestigated the therapeutic possibilities of asiaticoside and claim that it is of considerable value in the treatment of leprosy and lupus erythematosus in man and of experimental tuberculosis in the guineapig. Without giving the number of cases treated, they mention remarkable results obtained in a Madagascar leprosarium. All forms of leprosy—lepromatous, neural, and tuberculoid—are said to have shown clinical and symptomatic improvement, and the causal organism, *Myco. lepræ*, disappeared from mucous lesions within a fortnight. Eight of the lupus cases were treated with asiaticoside by intramuscular injection. The first few injections apparently produced an exacerbation of the lesions, which finally cleared and underwent epithelisation after two months' treatment. The drug appears to be relatively non-toxic, the only side-effects noted being a slight fall in blood-pressure and a heavy feeling in the limbs.

In view of the legion of remedies for leprosy that have not stood the test of carefully controlled observation, comparative studies should be made in the treatment of leprosy with asiaticoside and with sulphones such as 'Diasone' and 'Sulphetrone,' which seem to be the drugs of choice at the moment.

THE BALLISTOCARDIOGRAM

LYING in bed, some people are uncomfortably aware, particularly with overaction of the heart through emotional disturbance or after stimulating drugs, that with each heart-beat their whole body moves. Actually movements of this sort take place in all of us, and their nature and extent can be measured by getting the subject to lie on a table or bed suspended so that the motion is transmitted to fluid in a manometer. Alternatively, the movements can be converted with a high-frequency oscillometer into voltage changes, which are recorded optically. The apparatus used for making this record, known as a ballistocardiogram, has been described by American workers.[2] According to Starr and Mayock,[3] the normal ballistocardiogram has four main waves, which synchronise with ventricular systole, and smaller and more variable waves in diastole. They suggest that an abnormal ballistocardiogram indicates disease or some alteration in dynamics of the heart, as in hyperthyroidism or hypertension; and though admitting that an abnormal record has been obtained in the absence of detectable heart disease, they deny that any but a normal curve is ever obtained in a healthy young adult. One positive should be not only tolerated but actively encouraged—is this not perhaps an important turning-point? Are we perhaps standing on a watershed? May we yet hope and expect to see in the years to come a resurgence of voluntary effort, great and small, freed from the slight suggestion of antagonism on the part of the learned and enlightened who mould the thoughts of the younger generation of economists and politicians?

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[1] Boiteau, P., Saracino, R. *Méd. franç.* 1948, 8, 251.

[2] Nickerson, J. L., Curtis, H. J. *Amer. J. Physiol.* 1944, 142, 1. Brown, H. R. jun., Pearson, R. *Amer. Heart J.* 1948, 35, 756.

[3] Starr, I., Mayock, R. L. *Amer. J. med. Sci.* 1948, 215, 631.

Annotations

INFANT MORBIDITY

Ever since the time of John Graunt, infant health has been the happy hunting ground of the vital statistician. Mortality, whose extent and nature are recorded by law, has because of its accessibility been the measure of child welfare used in innumerable studies. Yet it is morbidity, the precursor of death or serious disability, which is the everyday cause of anxiety to parent and doctor; so more precise knowledge of the incidence of illnesses in infancy, their case-fatality rates, and the chances of cross-infection is certainly required. In an attempt to supply such information, Selwyn Collins,[1] chief statistician to the U.S. Public Health Service, has analysed the results of a series of periodic canvasses of families living in different parts of the United States in the early 1930's. Broadly speaking, the morbidity experienced varied little, and the results have been combined to give a comparison of the age-distribution of the various groups of causes of sickness and death among infants in their first year.

In the U.S.A., as elsewhere, the trend in infant mortality, particularly in the later months of the first year of life, has been consistently downwards; and the death-rates at successive months thus show a sharp decrease with increasing age. Morbidity-rates, on the other hand, decline from a high rate under 1 month to a minimum in the second month and then rise to attain, about the sixth month, a new level which is maintained for the remainder of the year. More specifically, digestive and genito-urinary disorders are remarkable for their high incidence in the first few months of life, whereas the infective disorders, upper respiratory infections, measles, ear diseases, and tuberculosis all have incidence-rates which rise steeply with age. Whether this is due to the fading away of immunity derived from the mother or to the increasing risks of exposure it is difficult to say. Collins gives interesting details of the chances of cross-infection in the various infectious diseases. The risk of an infant being infected by another child in the same household is measured by the secondary-attack rate. Thus whooping-cough not only has a high incidence, particularly in the last six months of infancy, but is so infectious that of 100 infants exposed to a case in the household nearly 100 will become infected. Chickenpox is similar in its high incidence and maximum secondary-attack rate of 75–80%. In measles and german measles the secondary-attack rates are roughly 40%, while mumps, which has also the lowest incidence, never has a secondary-attack rate much above 20%.

The usual hospital and national mortality statistics give no indication of either the prevalence or the case-fatality rates of the illnesses of infancy. Collins's findings, though limited in scope, suggest that the chief causes of illnesses among infants are the common respiratory and digestive diseases, with whooping-cough and ear disease high on the list; but deaths result mainly from congenital and neonatal conditions, pneumonia, and diarrhœa and enteritis. The differences in case-fatality rate thus implied are brought out by comparing the number of illnesses of each type reported in the survey. Pneumonia, for example, causes 1 death for every reported cases; about 1 in every 25 accidents are fata whereas death follows only 1 in 100 attacks of whoopin cough and influenza, and only 1 in 500 cases of meas or ear disease. These are, of course, only rough indic tions, based on restricted evidence and complicated the therapeutic innovations of the 'thirties, but t method of relating special morbidity surveys national mortality statistics is one which we might w emulate.

GASTRO-ENTERITIS FLYING SQUAD

In what is believed to be the first venture of its ki in the world, the Hospital for Sick Children, Gr Ormond Street, London, has organised a flying squ to go to the help of institutions or others in difficult over an outbreak of *infantile gastro-enteritis*. T scheme, which is being partly financed by King Edwar Hospital Fund and has the good will of the Ministry Health, starts on Nov. 1. The squad will norma consist of up to five fully trained nurses and one doct to be taken from the team which has been work on this disease at Great Ormond Street. The prim purpose is, however, not to conduct research but fill any gap in resources for investigation and treatme and it is hoped that medical officers of health will use t service. Equipment will be carried in a lorry contain besides drugs, sterilisers and everything needed transfusions and infusions. Normally the resources the nearest laboratory will be used for bacteriologi studies; but the lorry also contains a power-dri centrifuge and other apparatus for simple work of t sort. Thus in isolated areas the unit could w independently of any hospital or institution, providi if need be, a domiciliary service.

The help of the squad, which is prepared to go a where, should be sought through the local medi officer of health or regional hospital board, or where need is acute by telephoning the house-governor Great Ormond Street (Holborn 9200).

IN THE MINES

At the best of times mining is a hazardous occupatio and the conditions of the late war, with its shortage men and materials, and its demand for greater productio were expected to aggravate the risks. This expectatio however, was only partly justified, as Mr. J. R. Felto the chief inspector, shows in his report for the seven yea from 1939 to 1946.[1] The death-rate per 100,000 ma shifts, which was 0·37 in 1939, mounted to 0·46 in 19 but after that it regressed to 0·30 in 1945 and 19 Translated into actual numbers, 783 miners were kill in 1939, 550 in 1945, and 543 in 1946. In parallel with t fall in fatalities, the rate of serious injuries decreas from 1·49 per 100,000 man-shifts in 1939 to 1·28 in 19 Analysis of the 2617 fatal or serious injuries sustain underground in this year shows that 1203 (46%) we caused by falls of ground, 660 (25%) by haulage ac dents, 295 (11%) by the use of explosives, 73 (3%) gases, coal dust, and fires, 63 (2%) by machinery, a 233 (10%) by other causes. Among the factors whic Mr. Felton suggests, may have contributed to this decli are concentration of work in smaller units with larg roads and better supervision; advances in technic knowledge; the more widespread application of pri ciples of roof control and support: greater use of ste supports; inspection; and the education and traini of miners. The record of less serious injuries, involvi three days' absence from work, is much less satisfactor The number rose from 134,072 in 1939 to 181,050

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[1] Collins, S. D. *Publ. Hlth Rep., Wash.* 1948, 63, 69.

[1] Ministry of Fuel and Power: Report of H.M. Chief Inspect of Mines for the Years 1939–46. H.M. Stationery Offi Pp. 38. 9*d.*

Special Articles

REHABILITATION IN INDUSTRY

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REHABILITATION SUPERINTENDENT

VAUXHALL MOTORS LTD., LUTON, BEDS

THERE is growing awareness of the urgent necessity f conserving the nation's man-power: and though the vention of disablement, as well as the employment of bled people, can make a contribution to this end, it is industry itself that a solution of the present wastage be found.

As a result of encouragement by an enlightened ectorate, a community of 12,000 people engaged in e medium engineering industry of motor-vehicle nufacture now enjoys its own domestic rehabilitation tre. For its foundation we acknowledge the help and idance of the pioneer organisation at Austin Motors.

A rehabilitation team has been set up consisting of sulting orthopædic and plastic surgeons, an industrial dical officer, a rehabilitation superintendent and his puty, and an industrial physiotherapist. The activities f this team, in group consultation, are centred in a cial rehabilitation machine shop, or "retraining op," run on standard production lines and accommodating up to 60 men. The scheme has been in eration since 1945, and the shop opened in April, 1946.

The shop is housed in a new building set in pleasant roundings, and features such as good lighting and rior decoration have been the subjects of special y. Here, by utilising standard machines, or bench s, modified and adapted to secure controlled range power of movement, remedial occupations and d work are prescribed for patients by the visiting ons and the industrial medical officer.

he full team visits once a week, when, at a follow-up clinic and during a subsequent round of the aining shop, all patients are reviewed, treatment is ussed, and progress is recorded.

A whole-time rehabilitation superintendent is in charge of the retraining shop. He is a trained engineer of senior status who, before taking up his duties, was given an opportunity of studying the broader social and economic aspects of the local industrial conditions and hospital services. He is responsible to the company medical officer, and his duties include the placement of all incapacitated factory personnel. He is the liaison officer between the hospital and the factory.

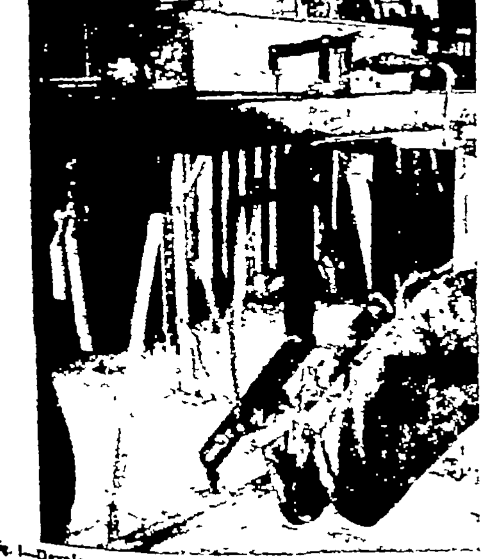

Fig. 1—Development of quadriceps muscle against graduated counter-weights at a leg-operated bench for a countersinking operation.

An assistant rehabilitation officer, selected for his abilities as a teacher of machine-shop practice, is in immediate charge of the men in the retraining shop, and his services are available if vocational training is required.

Though the scheme is intended primarily for works accident cases, disabled ex-Servicemen and employees injured away from work are catered for. The report of the Delevingne Committee showed that industrial accidents accounted for only 30% of the total; hence there is ample opportunity for rehabilitation within industry apart from purely works accident cases. Medical and psychological cases presenting difficulty in placement are also admitted for graded work until they can be accommodated elsewhere in the factory.

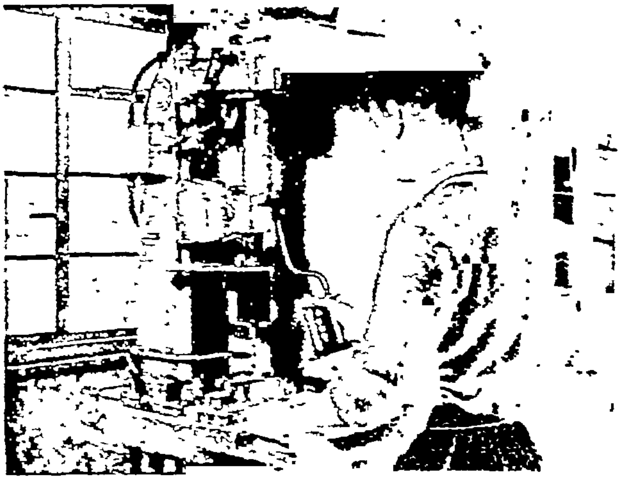

Fig. 2—Combined active and passive flexion of the fingers using a 'Sorbo'-padded and adjustable grip attached to the handle of a single-spindle drilling machine. This patient was successfully treated after primary suture of cut flexor tendons of three fingers.

In the twenty months after the shop was opened, some 452 patients passed through it. Of these, 355 (78·6%) were surgical, 72 (15·9%) medical, and 25 (5·5%) psychological. The average length of stay for all patients was thirteen weeks, and that for surgical cases six weeks. In some instances placements were preceded by a temporary trial period on selected work within the factory to ensure that the work was suitable to the patient and that the patient was acceptable to the supervision. In this connexion emphasis is placed on finding the right job rather than a light job, but in no sense is the retraining shop regarded as a refuge for invalids, and the general morale of the men has remained consistently high.

Summary of admissions

Works accident cases	257 (57%)	Medical cases	72 (15·9%)
Non-occupational cases	195 (43%)	Surgical cases	355 (78·6%)
		Psychological cases ..	25 (5·5%)
Total ..	452		

Surgical cases

Fractures	125 (35%)	Soft-tissue injuries ..	230 (65%)

Disposal

Return to full work	382 (85%)	Return to modified work	70 (15%)

In addition to the cases which passed through the shop, some 450 other placements made necessary by health observation is the finding of a distinctive curve with left ventricular aneurysm. The ballistocardiogram has also been used for measuring cardiac output[3]; indeed Nickerson and his associates claim that this technique is just as accurate as one based on right atrial catheterisation.

ORDINARY GIRLS

ALL girls are silly and ignorant, pronounced Mr. Bennet, without stopping to reflect that all he had done for his own five was to give them a silly mother and precious little education. Small wonder if they were occupied with thoughts of early marriage; and was this, after all, such a bad thing to think about? The "ordinary girls" in Miss Pearl Jephcott's study, *Rising Twenty*,[4] are in much the same position as the Miss Bennets and the Miss Dashwoods of a century ago. They are filling in time until they marry, and filling it with something more useful, on the whole, than drawing, purse-netting, and singing to the harp. Miss Jephcott's study, made in 1945–46, covers just over a hundred such girls, living in three parts of England—a pit village in County Durham, a cluster of blitzed streets near Piccadilly Circus, and a northern industrial town. They were all over 17 and under 21 when she knew them, and they talked to her of their life since they left school—" those years between 14 and 18 when, according to the stock statement which so many made, 'I learnt more than I ever did before.' "

They worked in shops and factories, and nearly all found their work boring. Life begins for them when work finishes, and they are free to spend their evening dancing, skating, or at the cinema, at first with a group of other girls and boys, and later in couples, each girl taken—and paid for—by the boy with whom she is "going steady." But this behaviour does not really justify the accusation, so often made, that these girls are "pleasure-mad." Once they get engaged they settle down quietly enough, and save up for a home. When their betrothed husbands were absent in the Army, many of the girls hardly went out at all. Marriage is their career, and almost the only career open to them which has creative aspects; and the single-mindedness with which they pursue their end would earn them praise if they were students working their way through college. They are not unaware of the heavy obligations of marriage, for they see them borne by their own parents; and some even comment on married life as "all drudgery." Nevertheless it is traditional that they must enter it, and to remain unmarried is to fail. Seen from this angle, their behaviour is perfectly logical and not at all unworthy. They must meet their future husbands, and the accepted way to do this is to go dancing. Youth clubs do not offer comparable opportunities, because there the boys are contemporaries —too young for mates and too rowdy for companions. The cinema sets their standards in appearance and hairdressing, and has on the whole been responsible for a great advance in both since the turn of the century. In the factory the girls are given dull repetitive jobs, entailing long hours of standing. Nursing, which might, if it offered more freedom, prove an attractive alternative, they reject because they believe it would ruin their prospects of marriage. They prefer the boredom and fatigue of a dead-end job because it gives them the money and leisure for their more serious duty of finding a mate. By social and biological standards they are serving the race, and doing it entirely at their own expense.

The tragedy which appears in this study is their paucity of other interests: they are not politically informed, and often fail to join a union; they chiefly read love stories, and they have few constructive hobbies. " girl who consistently tries to sing, or to dressmake to act, or to play a game, let alone to pursue anyth a shade *more out of the ordinary* than any of thes the exception." Marriage brings them new experie and skills, but debars them still more firmly f interests outside the home. Yet, limited as they ar outlook, these girls, Miss Jephcott finds, are *fu* mentally good-hearted and kindly. They take t share of the family responsibility, often giving up or two evenings or an afternoon regularly every wee mind the baby or help with washing or housework. a world with little attention to spare for the si business of living they are, in a sense, holding to fu mentals; if they need rescuing—which seems uncer —it is from the boring circumstances in which they c out their purpose. Any attempt to help them—wh on the part of youth organisations, churches, educati bodies, or juvenile employment bureaux—should directed towards enriching their lives.

SYMPATHECTOMY AND THE HEART

IT is well over eighty years since von Bezold de strated the rôle of the vagus; but other factors control heart-rate have been worked out only recently, even now the mechanism in man is somewhat obsc Cardioaccelerator nerves are generally believed to r the heart through the 2nd–5th dorsal ganglia of sympathetic nervous system; and Smithwick and colleagues[1] report that bilateral removal of these gan is followed by slowing of the rate, whose respons exercise becomes less pronounced. The effect of lateral removal is variable; and it seems that, tho the sympathetic innervation from the right side usu exerts a greater influence than that from the left, only way to ensure slowing is to perform sympathecto on both sides. Two further observations are of inter First, in a child aged 15 years, bilateral excision of 2nd and 3rd dorsal ganglia for hyperhidrosis ca "decided diminution" in pulse-rate and a le response to exercise; but the same operation i woman of 56 with Raynaud's disease had no such Secondly, in a group of four hypertensive patient whom extensive splanchnic denervation had previo been performed without effect on the heart-rate, s sequent removal of the 2nd–5th dorsal ganglia followed by definite slowing.

The variable response to unilateral sympathecto is ascribed by Smithwick and his associates to variations in sympathetic innervation. Another tion which cannot be altogether discounted is as in the dog, cardioaccelerator fibres may be in the vagus; and this would explain the oc case in which bilateral sympathectomy has little able effect. The practical implications of this are not altogether clear, but it suggests that in surgical treatment of hypertension low dorsal sympat tomy, which is liable to result in increased heart- should be accompanied by removal of the 2nd– dorsal ganglia. Possibly this operation might be use also in some cases of angina *pectoris* accompanied tachycardia, but careful assessment would first necessary. From the U.S.A. have come repeated acco of a "sympathetic syndrome," characterised by h ache, precordial pain, tachycardia, and hyperhidros here, too, a localised upper dorsal sympathecton despite its risks, might occasionally be justified.

WE regret to announce the death of Dr. C. WENYON, F.R.S., on Oct. 24, at the age of 70. Till 19 Dr. Wenyon was director-in-chief of the Wellco Research Institution.

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[3] Cournand, A., Ranges, H. A., Riley, R. L. *J. clin. Invest.* 1942, 21, 287. Nickerson, J. L., Warren, J. V., Brannon, E. S. *Ibid*, 1947, 26, 1.

[4] London: Faber & Faber. 1948. Pp. 200. 8s. 6d.

[1] Chapman, E. M., Kinsey, D., Chapman, W. P., Smithwick, R. *J. Amer. med. Ass.* 1948, 137, 579.

Under these conditions men can work their way back to normal in surroundings with which they are accustomed, fully employed on a constructive job, with the stress on a system of treatment which they know can lead them back to their pre-injury status.

INDUSTRIAL OCCUPATIONAL THERAPY

For the provision of remedial movements highly skilled operations are completely unnecessary. By far the most valuable machine-tool is the single-spindle drilling machine. By adding special equipment to the operating lever most movements can be obtained for hands, arms, and shoulders. Other exercises for upper limbs are provided by the bending of copper and steel pipes round formers at the bench. Bending a $^3/_8$ in. steel rod by pulling on a 5 ft. bar gives an easy rowing motion which promotes development of the main trunk muscle groups. By adjusting the height of the lever on the machines controlled range and power can be obtained for arm and shoulder injuries. Simple bench vices operated by the foot are valuable in the early treatment of ankle and knee injuries. More intensive muscle development is encouraged on kick and pedal action riveting machines used in the closing of small tubular rivets. On such machines it is possible to obtain 9000–10,000 movements daily without fatigue. Fly presses, lathes, and milling machines make up the standard equipment, and besides these there are special pieces of apparatus capable of normal production work which have been designed from anatomical blueprints for specific therapeutic purposes. The ideas for appliances and adapters to suit individual patients arise from consultation between the surgeon and the engineer. These conferences are of great mutual benefit to both [illegible], who learn much about the principles and problems of each other's profession. "Retrainees" are encouraged to suggest modifications of any appliance or machine that would still further aid recovery, and some of these suggestions have evolved into standard remedial apparatus. The services of the more highly skilled men and suitable psychological cases are utilised in the design and construction of appliances required in the shop.

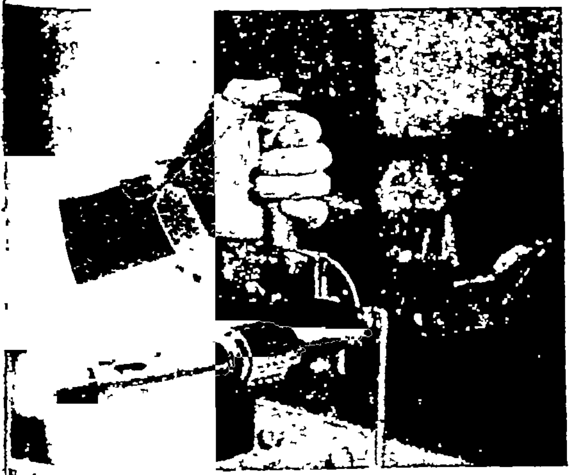

Fig. 6—Spring-loaded plunger incorporated in a hand tapping device to encourage flexion of thumb-joint after suture of tendon. Trick movements by the thumb adductors are prevented by the moulded 'Perspex' splint.

A wide selection of dry bench work which can be graded for dexterity, range of movement, and power is found invaluable in the early stages of hand and arm injuries. This work is suitable even for infections and fractures of the hand which require dressings and splints, and there are few patients who cannot thus be accommodated within a day or two of injury.

TABLE I—PERIODS OF INCAPACITY AFTER COMMON LESIONS

Diagnosis	Vauxhall patients 1945–48 (accident and non works accident cases)			Other patients 1945–48 (Luton and Dunstable Hospital fracture clinic)			F.C.R. (1)	F.C.R. (2)
	No. of cases	Average days off work	% losing no time	No. of cases	Average days off work	% losing no time (1945–46)	Average days off work	
Pott's fracture.. ..	39	18·9	15	132	32 9	2	329	77
Colles's fracture ..	17	3 9	80	59	22·4	10	203	49
Fractured scaphoid ..	30	7·7	72	55	14·7	30	322	77
Fractured hallux ..	26	5·0	54	16	24 5	10	..	..
Operations for internal derangement of knee	12	16·25	..	20	31·5	..	..	..

F.C.R. (1) B.M.A. Fracture Committee report, 1935. Cases not treated in organised fracture clinics.
F.C.R. (2) B.M.A. Fracture Committee report, 1935. Cases treated in fracture clinics of Liverpool and Manchester.

Continuity of treatment and of observation is assured under these conditions up to the time for return to full work. Every aspect of the patient's welfare is covered, and his absorption back into the normal working community is made as rapidly and smoothly as possible.

Cases requiring further investigation, radiography, or plaster changes at the hospital are collected once a week and, in company with the rehabilitation superintendent, are transported to and from the hospital by coach with considerable saving of time. During these visits the superintendent can make personal contact with new patients still actually in hospital, and by means of a follow-up system the more serious cases can be assured of an early inclusion in the retraining scheme.

One of the by-products of successful rehabilitation is the number of man-hours saved to the benefit of the patient, to industry, and thus to the community as a whole. Tables I and II, give some indication of the results to be expected in some of the commoner injuries encountered in industry.

PHYSIOTHERAPY

It is obvious that physiotherapy is a necessary and important adjunct to an industrial project of this kind. Here there is a modern well-equipped unit employing a whole-time staff. It is situated close to the retraining shop, and this proximity suggests the importance attached to the close coöperation between them. From the physiotherapeutic point of view it must be admitted that the ability to rely on long periods of controlled active exercise in the shop ($42^1/_2$ hours a week) is a great advantage. On the other hand, orthodox physical treatment is found necessary in 60% of cases under the following group headings:

(1) *Re-education of Movements to a Point where they can be Utilised Actively at Work.*—In this group come, for example.

TABLE II—PERIODS OF INCAPACITY AFTER HAND INFECTIONS APRIL–DECEMBER, 1947

Diagnosis	Vauxhall patients			Other patients		
	No. of cases	Average days to no growth	Average days off work	No. of cases	Average days to no growth	Average days off work
Paronychia ..	6	7·1	3 8	42	6 6	5·5
Pulp infections ..	14	6 0	5 0	66	9·7	11·9
Subcutaneous whitlow	8	5 7	5·5	30	6 0	4·5
Web-space infections	6	2 6	6·1	21	7·6	8·7

reasons were dealt with by the medical and rehabilitation departments.

PRINCIPLES

The patients or "retrainees" are paid the equivalent of their basic rates of pay plus 20% in lieu of bonus where this is applicable. Suitable work is selected from within the factory and scheduled for the shop. Much of this work is familiar to the men, and their contribution to the production demands of the factory is in our view a far more powerful stimulus to recovery than is the standard type of occupational therapy. Moreover, the advantages of working in a "live" shop where treatment is individually planned, and with a forward outlook on recovery, are of immense value, both from the economic and psychological points of view, in securing the patients' full cooperation.

One of the principles underlying the establishment of this scheme is the value of repetitive exercise, and much of the research that is going on is concerned with the adaptation of machinery so that its operation ensures controlled repetitive movement. From the point of view of the injured workman the criterion of successful treatment is his ability to do his pre-accident job. The surgeon's aim should be the maintenance or development of coordinated full muscle power across joints capable of their normal range of movement in limbs which have normal sensation. Viewed from this angle, the actual surgical procedure, reduction of fractures, suturing of tendons, and draining of felons, though essential, is merely the gateway to the path of recovery.

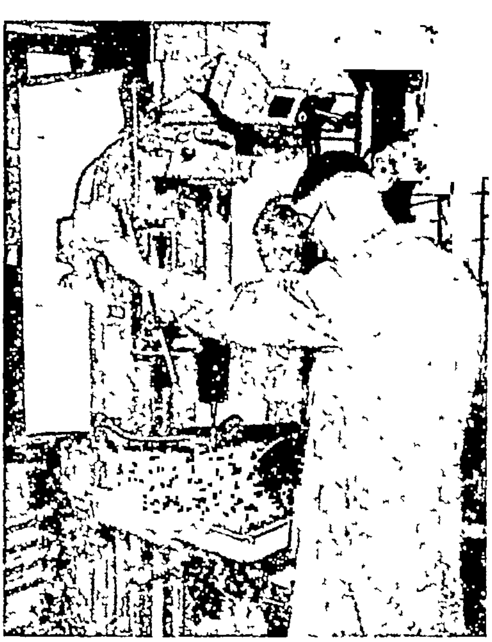

Fig. 3—Mobilisation for fractured shoulder-joint with adjustable grip transposed from right to left side of single-spindle drilling machine.

There are four causes of loss of limb function from trauma: direct severance of vital structures, tissue destruction by infection or by burning, cicatricial replacement of lost tissues or of œdematous exudates, and artificial immobilisation. In all of these the important factor militating against recovery is the time during which function is depressed or prevented, and thus the effects of all may be considered in terms of partial or total immobility. It is well recognised that there are certain therapeutic indications for rest, but these indications are far less common than has been believed in the past. This leads us to review all injuries to reduce immobilisation to the minimum and to encourage function in all structures which do not demand rest. One of the most noticeable features in a régime of this sort is the absence of circulatory disorders. An active circul is reflected in the rapid healing of bone and soft t with a consequent reduction in joint stiffness and of muscle tone. The restoration of maximum f depends on the maintenance of such muscle power movement as is possible after injury and the re-educa of such function as is lost. *It is in this proce* re-education that repetitive exercise is the key and it is just as true that practice makes perfect in accident treatment as it is in the acquisition of any skilled procedure. The development of muscle pow of range of movement, and of coordination can readily be effected by repeated attempts to what is already there.

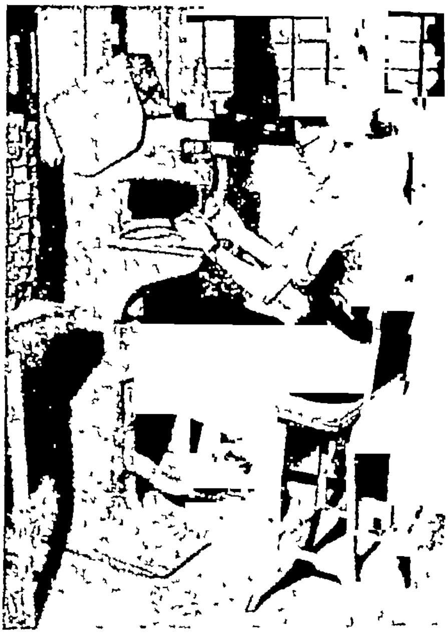

Fig. 4—Development of quadriceps by pedal-action press. This shoe riveting machine gives 10,000 movements a day and is adjus for range and power of movement at knee-joint.

This treatment requires careful control to pr fatigue; so repetitive exercise should be alternated repetitive rest. It requires control also to ensure th not only are all the normal functions being maint at a normal level *but also that re-education* is procee without the development of abnormal or "tric movements.

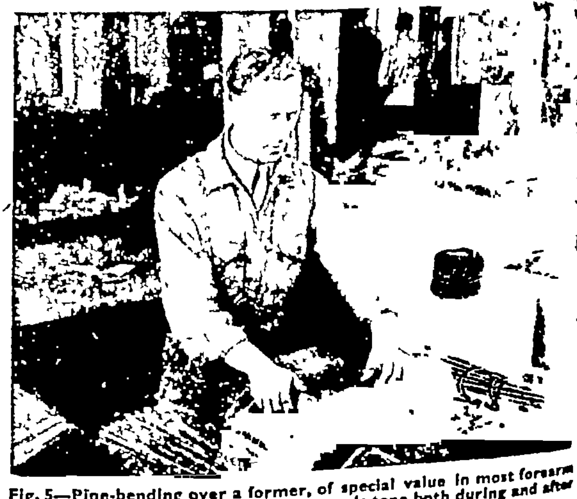

Fig. 5—Pipe-bending over a former, of special value in most forearm and hand injuries for maintaining muscle tone both during and after immobilisation in plaster.

al these cases diversional therapy, such as the construction dial appliances, was found to be most beneficial.

CONCLUSIONS

xperience leads us to believe that, where facilities vided for comprehensive rehabilitation within y, the injured employee needs little or no on to avail himself of this service. Such a has an important contribution to make towards edicine and produces good relations between the r and his employer and with the medical profession ole.

in aspects of the scheme can be expanded into a designed to deal with the accident problem of ite community.

p industrial rehabilitation centres should be on up-to-date and well-staffed hospitals where for diagnosis and controlled surgical nt are present.

hospital should be supported by an enlightened ice of general practitioners who would be prepared modify present methods of certification and accept standards regarding fitness for modified or selected k. Training in the basic principles should form t of the medical school curriculum.

ttached to the hospital there should be a remedial shop with facilities for general exercise therapy. should be closely allied with the physiotherapy rtment and should be supplied with equipment and k from the local industry.

he equipment should be of a simple nature in which principles of adaptation can be applied and studied. work done should be constructive, interesting, and ive repetitive movement.

tients treated in the workshop should be limited to who cannot be absorbed back into suitable tions in their own industry.

on with all industrial interests of the district be created by a rehabilitation superintendent from the hospital. His responsibility should led job-analysis in all accident cases and survey patients' working environment so that gradual to full employment can be expedited by a wise of interim occupation during the retraining d. He should also superintend the workshop.

h a group centre is already in existence at the Luton Dunstable Hospital, where it has been encouraging d that the support from industry has been most ous, and that the coöperation from management, vision, and the workers leaves nothing to be desired.

ACADEMIC SALARIES

soon as the Government accepted, in principle, the mendations of the third Spens Committee it e obvious that universities would have to review remuneration of doctors holding academic posts. a review might have far-reaching consequences niversity salaries as a whole, and the difficulties d are serious. On the medical side the Royal ge of Physicians, expressing grave concern, has mmended that "the remuneration of whole-time emic appointments should be brought into appro- e relationship with that of other consultants and lists," which it thinks "might be done by additional eration for hospital responsibilities." But it also s that "careful attention will be given to the uneration of academic staffs engaged in the funda- ntal sciences, so that their position will not be judiced." Its resolutions have since been endorsed y the council of the Royal College of Surgeons, in whose nal report they are now published.

Dr. Charles Hill, for the B.M.A., has pointed out that for the first time we have ranges of remuneration pted by the Government as appropriate to large ctions of the profession and we shall seek their proper application to groups not specifically covered by the two Spens reports."

Public Health

HOME NURSING OF PREMATURE BABIES

IN NEWCASTLE-ON-TYNE

F. J. W. MILLER

M.D. Durh., M.R.C.P., D.C.H.

From the City Health Department and the Department of Child Health, Royal Victoria Infirmary, Newcastle-on-Tyne

THE object of this study has been to discover the results of nursing and treating premature infants in their own homes and to collect information to answer the question whether it is better for a premature infant to be born at home and nursed there or to be admitted to hospital. The facts presented here were obtained in 1945–47 after the introduction of the notification of prematurity and the establishment of a home-nursing service for the care of premature infants. The methods used have been previously described.[1]

The background of this experience is an industrial city of 280,000 inhabitants in north-eastern England. The standards of housing have always been low but were much improved by strenuous municipal effort in the 1930's. The Overcrowding Census in 1936 showed that 10% of working-class families lived in overcrowded conditions (calculated on a basis which did not include any children under the age of one year in the permitted number for a room). Since 1939 economic standards have improved, housing conditions have deteriorated, but the infantile mortality has fallen steadily from 91 in 1937 to 40 in 1945 and 41 in 1946.

TABLE I—INCIDENCE OF PREMATURITY

Place and date	No. of births	No. of premature births	No. of live births	No. of live premature births
Newcastle-on-Tyne 1945–47 ..	16,323	1042 (*6·4*%)	15,862	916 (*5·7*%)
Birmingham [3] 1943–46 ..	85,305	5939 (*6·9*%)	83,118	5006 (*6·0*%)

In this country and in America most of the estimates of the incidence of prematurity have been made from hospital data. These vary between 3% and 12%. Baird[2] quotes Bundesen as stating the incidence of prematurity in Chicago as 6·5%. In Newcastle the incidence in 1945–47 was 6·4%, a figure almost the same as that published for Birmingham[3] (table I).

The weight distribution of the 916 infants was as expected: 54% of the premature infants were between $4^{1}/_{2}$ and $5^{1}/_{2}$ lb. at birth, 27% from $3^{1}/_{2}$ to $4^{1}/_{2}$ lb., and 19% $3^{1}/_{2}$ lb. or less.

The neonatal mortality again showed the well-known facts: of the 916 infants 208 (22·8%) died within the first twenty-eight days. Almost two-thirds of these, 124 (59·6%), died on the first day, and 188 (90·4%) in the first week.

In 1945-47 there were 400 neonatal deaths in Newcastle; 208 (52%) were in premature children.

RESULTS OF HOME NURSING

The fate of children born at home and in hospital in the first twenty-eight days is shown in table II. These groups cannot be directly compared, but the numbers and results are equal until the weight-group $4^{1}/_{2}$–$5^{1}/_{2}$ lb. is reached, where, in my opinion, the difference is likely to be the result of different obstetrical rather than pædiatric care.

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1. Miller, F. J. W. *Arch. Dis. Childh.* 1947, 22, 54.
2. Baird, D. *J. Obstet. Gynæc.* 1945, 52, 217, 339.
3. McNeil, C., Crosse, V. M., Hallum, J. L. *J. R. sanit. Inst.* 1947, 67, 403.

many of the hand injuries, joints released from splints, sutured tendons, and rested muscles. For these the "feeling of movement" is re-educated under supervision. This is a delicate and skilled matter, and should not be entrusted to the coarser persuasion of mechanical assistance obtainable from adapted machinery.

(2) *Maintenance and Stimulation of the Circulation.*—Here the various forms of heat treatment and massage are invaluable. In the early stages of many upper-limb injuries a persistent sympathetic constrictor effect must be combated, especially in cold weather. These cases arrive at the factory in the morning with cold blue hands incapable of working efficiently. Fifteen minutes in the high-temperature wax bath releases the spasm and mobilises the limb to a point where its own activity on the production line maintains its circulation throughout the day.

(3) *Muscular Disorders.*—Muscle sprains and ruptures, fibrositis, and tenosynovitis form a large group which requires physiotherapy as a primary treatment. This is given while a patient is employed in selected or modified occupations which may or may not necessitate admission to the shop. Many of these patients are absorbed back into the factory where the demands made on them are checked by the rehabilitation superintendent so that progress is not retarded by enforcement of unsuitable work.

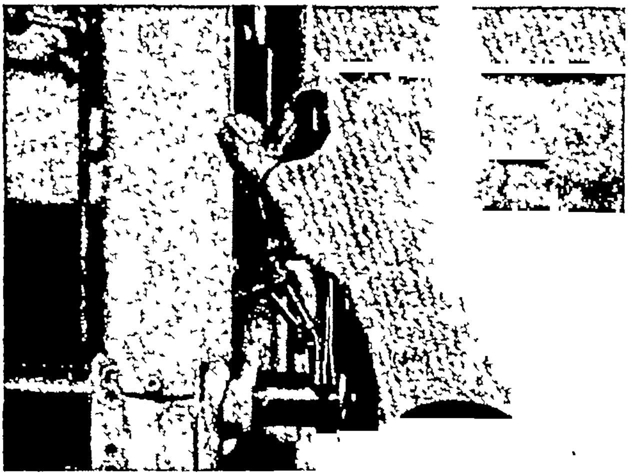

Fig. 7—Mobilisation (adduction and abduction) of thumb by grip attached to handle of drilling machine operated by squeezing action.

(4) *Infections.*—Cases of chronic sepsis, osteomyelitis, and unhealed wounds in the later stages of treatment attend for either short-wave or ultraviolet therapy.

(5) *Nerve Injuries.*—Whereas the shop can take care of non-paralysed muscles, special attention should be paid to denervated muscles to prevent wasting, contracture, and deformity. The full resources of the physiotherapeutic department are necessary to obtain maximal recovery of function.

The demand made on this department was as follows:

Therapy	*Percentage of cases treated*	*Indication*
Exercise	26·0	Early re-education of movement in tendon and joint injuries, fractures, burns; and splinted limbs.
Short-wave	18 5	Infections, tenosynovitis, and chronic osteomyelitis.
Wax baths	17·0	Healed hand injuries.
Infra-red rays	10 0	Pre-wax-heat therapy.
Faradism	9 5	Re-education of intrinsic hand muscles.
Massage	9 0	Fibrositis, tennis elbow, and scars.
Ultraviolet rays	8·5	Chronic wounds and general tonic therapy.
Galvanism	1·5	Nerve injuries.

MEDICAL REHABILITATION

Because the emphasis has been on the treatment of surgical conditions, the problem of medical rehabilitation has been thrown into greater relief. An attempt is being made to study the effects of graded work and controlled

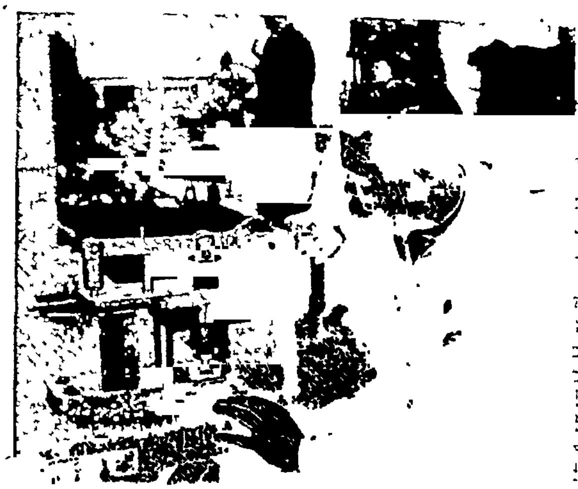

Fig. 8—Spring-loaded hand press for mobilisation of wrist in later stag of recovery from fractured scaphoid, Colles's fracture, &c.

environment on groups of medical cases which can briefly considered under the following headings:

(1) *Convalescents from acute illnesses* have responded ve well to a period of graded work before their return to f activity. Evidence of this is the fact that most of the gained in weight while in the retraining shop, but restor earning capacity after protracted illness was no doubt contributory economic factor.

(2) *Peptic-ulcer cases* remained quiescent in sympton kept good time, and required no special treatment beyo facilities for a light midday meal and relief from night wor It is not suggested that such a régime would solve the proble of the chronic dyspeptic in industry, the solution of which still far to seek.

(3) *Cases of industrial dermatitis* settled down quickly dry clean work and were submitted to trial periods in conta with the suspected cause to test their skin reactions.

(4) *Chronic medical cases,* in particular those associat with advancing age and inability to compete with young men, responded less satisfactorily, and little or no mater advantage followed attempts at rehabilitation on grade work. In our view this type of case calls for suitable permanent placement rather than for admission to a industrial rehabilitation centre.

(5) *Cases of neurosis* responded in a variable manner. Mil anxiety states with or without depression, whether precipitate by domestic or working conditions, improved provided the were of recent origin, when given a period of relief from th hectic atmosphere of the production line. Others associate with simple or chronic industrial fatigue, maladjustment, resettlement difficulties after war service responded favourabl though some required occupational adjustment on discharg

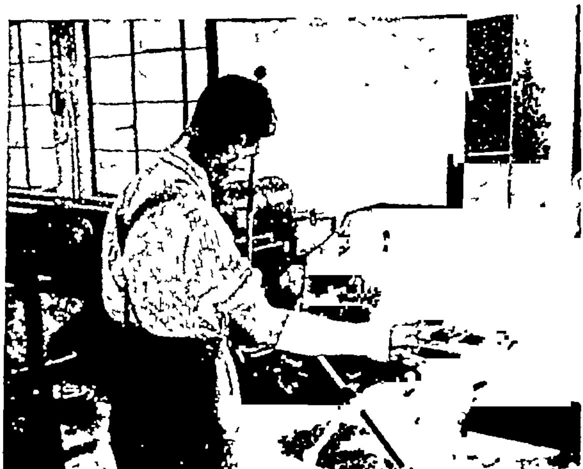

Fig. 9—Patient with fractured scaphoid working a capstan lathe with his forearm in a plaster splint modified to allow maximal function of ha and arm.

actively desire to do the work and must be volun- in the true sense of the word. They must be given well-defined responsibility and must have the support material and moral of administrative and pædiatric

The second point of great importance is the effect the home nursing on the family. Today, when so of our social services and institutions undermine confidence and strength of the family, anything in nature of common effort which increases family and solidarity becomes doubly worth while.

The effect on the morale of the family was not realised the service was started, but its significance and rtance were soon apparent. The nurse in her rôle teacher and adviser and by her personality mobilises family for duties: someone to watch at night: one to watch during the day; someone, probably neighbour, to shop; everyone interested is involved all have a sense of achievement, which gives the a good start and is far better than if he were taken to a hospital and returned a month or six weeks, an unknown infant, feared and strange.

SUMMARY

In Newcastle-on-Tyne in 1945–47 the incidence of born premature children was 5·7%: of 916 liveborn ature children 208 (22·8%) died in the first ty-eight days.

Data of the results of the home nursing of premature are presented, and it is shown that the results children of a birth weight above 3½ lb. are of the order as those which were likely to be obtained hospital.

The experiment could not have been done without the of the staff of the midwifery service of the Health Department. The assessment of the results not have been possible without the help of Dr. V. M. To all these I wish to record my appreciation and

Births and Deaths in the Third Quarter

Registrar-General[1] has issued the following for England and Wales in the quarter ended 30 (comparable figures for the same quarter last in parentheses):

births: 192,073 (216,509); rate per 1000 population (2[illegible]0) Stillbirths: 4433 (5073); rate per 1000 live still births 22·6 (22·9). Deaths: 101,664 (97,099); per 1000 population 9·4 (8·9). Deaths of infants under : 5468 (7141); rate per 1000 live births 28·0 (32·0).

The figures for stillbirths and infant mortality are lower in any previous trimester, superseding the records in the June quarter this year.

Births in the U.S.A.

Changes in the circumstances attending the birth of are noted by the United States Public Health . In 1946 over 82% of live births took place hospital; this was more than twice the percentage in . Of live births outside hospital in 1946, only were attended by a midwife or someone other than doctor, whereas the proportion in 1935 was 12·5%. 1946 infant mortality was 33·8, and maternal mortality per 1000 births; the comparable figures for 1935 55·7 and 5·8, respectively.

Encephalitis in Japan

On July 20 an epidemic of B-encephalitis broke out Japan, and by Sept. 11 a total of 6620 cases and 21 deaths had been reported. The outbreak, which has involved all prefectures but principally Tokyo, is now waning, according to W.H.O. figures. In the last week of August and the first two weeks of September the numbers of cases were 1389, 1081, and 585 respectively; and in the third week of September the daily total averaged less than 50.

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[1] The Registrar-General's Return of Births and Deaths for the Week Ended Oct. 16. H.M. Stationery Office. 6*d*.

In England Now

A Running Commentary by Peripatetic Correspondents

SINCE I read those articles on selection in the Students' Number I have felt like a layman who crawled into *Crockford* just by buying a clerical collar. Certainly I should never have been selected. After weeks of feelings of intense unworthiness I am now swinging over to mildly manic symptoms. What fools those fellows are in thinking that they can select! Do they know anything about most of the jobs for which they are selecting? About general practice? I do, I have done 250 locums, and I have never met two G.P.'s alike. Some get their results almost on personality alone, others on compassion, others—and probably the least effective—on pure erudition. Most mix all three in varying amounts. One man I knew succeeded by being a compendium of domestic and nursery medicine —*Nasturiorum folia* are "good for" lumbricus lothario, so-and-so is excellent for so-and-so. Another was a perfect genius at cross-examination, and even before the diagnosis must come the facts. There are 999 meanings behind "I have a pain in my stomach" and in twenty questions to get the right one requires genius.

Probably the one gift a G.P. must have or acquire is of being able to put himself in the patient's place—see with his eyes the sordid hopeless scene, hear with her ears the cry of the unborn, feel the longing behind the placid face, be in the factory where it happened, sense the closing walls of circumstance, glimpse the coloured toy that is the end of all desire, know the slow winding-sheet of toxæmia, the hope that flickers in old age and death, and the fear that has no feared thing. In short, sym-pathy with a hyphen, a subject not in the curriculum.

* * *

The first effect of the Act was to fill my surgeries to overflowing, rather to the justification of the cynics and the surprise of myself. But everyone had *something* wrong, and I have seen no evidence of malingering.

As time goes on one is able to analyse the manifold causes of this increase. First, many come who on getting a chill previously purchased a bottle of Dr. Quack's double-quick cure at the chemists, feeling now, not surprisingly, that if they pay insurance they're going to get value for it. (Very few of the public understand how little of the medical side of the scheme is paid from the insurance stamp.) Then of course—what we all expected and on the whole feel is a good thing—the mothers with children suffering from minor ailments and behaviour disturbances. What swells my prescription lists is for the mother to say, as she buttons up her child, "And while I'm here, doctor, I feel rather run down myself." But I think there is very little abuse. In fact, another reason for my swollen surgeries is that many come who should really be at home, forbearing to call me out; and my visiting-list is actually down a little on last year, saying much for the decency of human nature here, and I expect everywhere. When I am called out, it is with apologies, and I am touched by a small influx of little gifts in kind, meant to indicate the embarrassment of those who can't get used to not paying. The one thing that annoys me considerably is the number of patients coming for certificates for optical examination. Having no particular optical skill I cannot say that examination is unnecessary; and so I have to sign them all, an irritation both to me and the patient who has to wait. The sooner this certificate is abolished the better.

As to prescribing, I go my own way, as ever, avoiding polypharmacy as much as possible. But old dears with chronic and incurable varicose ulcers use up vast quantities of dressings and applications, and when an old boy with an asthma I am unable to cure tells me he has for years only had relief from "Inhalo," I feel justified in ordering it for him. As a nation we lean too much on a bottle of "Rep. Mist": but it has a psychological value, and when—an earnest and unworldly beginner—I gave good advice instead of bad drugs, my patients melted away, to reappear complaining to my senior partner. So now I give a bottle of Mist.

TABLE II—DEATHS IN FIRST 28 DAYS IN VARIOUS WEIGHT-GROUPS AT HOME AND IN HOSPITAL, 1945–47

Weight	Home group		Hospital group	
	Births	Deaths	Births	Deaths
Under 2 lb. 8 oz. ..	36	35 (97%)	33	33 (100%)
2 lb. 9 oz. to 3 lb. 8 oz.	52	32 (61·5%)	53	35 (66%)
3 lb. 9 oz. to 4 lb. 8 oz.	124	22 (17·8%)	117	23 (19·6%)
4 lb. 9 oz. to 5 lb. 8 oz.	167	14 (8·4%)	334	14 (4·2%)
All weights ..	379	103 (27·2%)	537	105 (19·5%)

Table III shows the results in home care for the first twenty-eight days. Just as a direct comparison of home and hospital births cannot be made, so it is impossible to compare directly the "specialled" and "not specialled" groups. We could not provide, during this period, special care for all premature infants born at home, and medical practitioners and district midwives called for assistance from the "premature infant" nurses at their own discretion. In general, special assistance was asked for if they thought the smallest infant might survive or the larger infant ($4^1/_2$–$5^1/_2$ lb.) gave rise to anxiety. The results, however, merit note, especially in the group of infants between $3^1/_2$ lb. and $4^1/_2$ lb., in which there were only 7 deaths among 82 infants specialled, and only 22 deaths among 124 premature infants in the whole city.

ASSESSMENT OF RESULTS

To answer in any strict mathematical sense the question whether it is better for a premature infant to be nursed at home or to be removed to hospital, it would be necessary to make a comparison between the results of the treatment of a large group of premature children born and nursed at home with the results in a group of similar composition born at home under similar conditions and admitted immediately to hospital. I do not think, however, it will ever be possible to establish these conditions but I have been helped, in forming an assessment of my results, by Dr. V. M. Crosse, of Birmingham, who has given me the results of the care of infants admitted to her premature-infant unit from home in 1944–46. The groups are very similar. I have explained that in Newcastle the special nurses tend to be called when the doctor or the midwife thinks a very small infant will have a chance of survival or when a larger infant is thought to require special attention. Dr. Crosse tells me that in Birmingham "a few infants die before admission, and naturally gross abnormalities are not admitted." Thus the groups are similar and both influenced by the same factors of selection and can be used as a basis for assessment of the home nursing. If this device is accepted as a basis of measurement, the results in the two groups can be seen to be of the same order over a birth weight of $3^1/_2$ lb. and rather less good in Newcastle below that weight. It is interesting also to compare the results from Dr. Crosse with the results of all the premature infants born and nursed home in Newcastle during these three years (table This procedure is manifestly weighting the assessm against the results of home nursing since, as I have alrea explained, some selection inevitably enters into th admitted to hospital. These results are given in tabl and show how high a standard of care can be achie at home under the most varied conditions.

TABLE III—RESULTS OF HOME CARE OF PREMATURE INFANTS FOR FIRST 28 DAYS, 1945–47

Weight	"Not specialled"			"Specialled"		
	Total	Living	Dead	Total	Living	Dead
Under 2 lb. 8 oz. ..	28	1	27	8	..	8
2 lb. 9 oz. to 3 lb. 8 oz.	27	7	20	25	13	12
3 lb. 9 oz. to 4 lb. 8 oz.	42	27	15	82	75	7
4 lb. 9 oz. to 5 lb. 8 oz.	123	109	14	44	44	..
All weights ..	220	144	76	159	132	27

DISCUSSION

Attempts to meet the problem of the care of premat infants born at home have hitherto been confined larg to the establishment of premature-infant units, and li attention has been given to the results of home care.

Though special accommodation is necessary premature infants born in hospital and perhaps for a born at home in the poorest circumstances, it is least open to question whether it would be wise or e practical to attempt to provide hospital accommodat for all premature infants born at home under a cer weight—e.g., 5 lb. It is particularly necessary answer this question now that so much thought is b given to the child-health services. My opinion is t with the expansion of the home-nursing service, impr ment in training of midwives (which should be the f tion of a few good premature-infant units in diff parts of the country), and flexible administration, mortality of premature infants could be much red by home nursing; the dangers of bringing infants hospital could thereby be avoided and, not least in th days, a more economical use made of the nursing servi

TABLE IV—FATE OF PREMATURE INFANTS ADMITTED HOSPITAL IN BIRMINGHAM COMPARED WITH FATE OF TH NURSED AT HOME BY SPECIAL MIDWIFE IN NEWCASTLE

Weight	Admission to hospital from home Birmingham 1944–46			Nursed at hom by special midw Newcastle 1945-		
	No.	Died	Survived	No.	Died	Surv
Under 2 lb. 8 oz. ..	34	30	10%	8	8	.
2 lb. 9 oz. to 3 lb. 8 oz.	117	44	63%	25	12	52
3 lb. 9 oz. to 4 lb. 8 oz.	228	30	87%	82	7	91
4 lb. 9 oz. to 5 lb. 8 oz.	200	11	95%	44	..	100

Further experience with this nursing service is obvio required both in Newcastle and in other parts of country, and I hope that the experience of others soon be recorded. In Newcastle we must give furt consideration to the problem of the premature inf under $3^1/_2$ lb. and determine in the future whether shall admit them to hospital or whether we can de other methods of home nursing which will improve results.

Finally, I wish to emphasise two important poi First, when such a service of home nursing is start the midwives or other nurses undertaking the t

TABLE V—FATE OF PREMATURE INFANTS ADMITTED HOSPITAL IN BIRMINGHAM COMPARED WITH FATE OF TH NURSED AT HOME IN NEWCASTLE

Weight	Admission to hospital from home Birmingham 1944–46			All premature infants born and nursed at home Newcastle 1945-		
	No.	Died	Survived	No.	Died	Surviv
Under 2 lb. 8 oz. ..	34	30	10%	30	35	3%
2 lb. 9 oz. to 3 lb. 8 oz.	117	44	63%	52	32	38%
3 lb. 9 oz. to 4 lb. 8 oz.	228	30	87%	124	22	82·3%
4 lb. 9 oz. to 5 lb. 8 oz.	200	11	95%	107	14	91·6%

marthrosis is likely after any procedure which involves ening the shoulder-joint.

1. "The difficulties in drilling the necessary holes in the noid cavity and in inserting the sutures are great." Since introduced the dental drill for this purpose, some ten years , these difficulties have been completely overcome. My regret is that I did not discover the drill until my second er (1938) was in print.

4. "Even if the torn structures are reapposed, there is iderable doubt whether they will be permanently united the formation of fibrous tissue." There is no doubt ever. When properly done, the fixation of fibrous (capsule, ligaments, or tendons) to bone is as certain anything in surgery.

"During the spasms which occur when the patient is ing round from the anæsthetic. . . ." Our patients do have postoperative convulsions or spasms, and the stion that *it is impossible to suture a muscle* (subularis) securely, because the stitches will be torn out by ular spasms, is most extraordinary.

"The coracobrachialis muscle and the short head of the ps muscle . . . by their contraction will tend to pull this ment (of coracoid process) downwards; . . ." But surely . Richardson is capable of fixing this piece of bone in place that it will not be pulled down. Elongation of the coid process is no part of my operation.

We have a safe and certain cure for recurrent dis- ation of the shoulder. It is a straightforward repair a definite and constant lesion. It does the least ible damage to the surrounding parts and it prac- lly restores the joint to its normal condition. It is difficult and it is within the competence of any geon of ordinary ability. It seems unnecessary to yet another bone-block operation to the list of tional procedures which ignore the true pathology of condition and attempt to cure the dislocation by ndabout means.

London, W.1. A. S. BLUNDELL BANKART.

BEDS FOR PULMONARY TUBERCULOSIS

—Perhaps you will allow me to reply to Dr. on's comments in your issue of Sept. 4. I cannot his suggestion that shortage of beds leads to on of motives in selecting patients for admission. , under such circumstances the case which has the est claim for admission is the one which appears to most likely to benefit by the available treatment. If resources comprise only a nursing staff, then perhaps accommodation should be used to help the chronic alid. If, on the other hand, the facilities are those of great modern thoracic hospital, surely the patient mitted should be one able to benefit most from such nities. The question of an individual or social blem should not complicate the issue.

Now, I certainly have a bias toward collapse therapy suitable cases of pulmonary tuberculosis, but I do believe in the "crash A.P.," or that quick collapse uld be the sole worthy objective in treating phthisis; equally, I should not like to feel it on my conscience a patient's health had been jeopardised by my willingness to induce a pneumoperitoneum or pneumo- rax. Few will dispute that the prognosis of the B2 B3 case of tuberculosis, conservatively treated, is —half the cases will be dead in two years. There is easing evidence that efficient collapse measures can stantially improve the outlook, and the best yardstick which to estimate initial efficacy is sputum conversion. If one aims at a programme of collapse measures for high a proportion of cases as possible, they must be gnosed and dealt with early; a delay of nine months fore admission is a substantial slice in the average onsumptive's remaining expectation of life. In this own it may be that phthisis is diagnosed early: at any ate there are less than 2000 people to each general actitioner, and over 2300 new patients were referred me in 1947, yielding 95 (4%) sputum-positive cases.

I feel confident that if Dr. Houghton's suggestions for upplementing nursing staff and absorbing waiting-lists an be realised, the results of collapse treatment generally ill be greatly improved.

Tuberculosis Dispensary, Reading. W. H. TATTERSALL
Chest Physician.

UNFORTUNATE NAMES OF HOSPITALS

SIR,—I hope that you will strongly support the suggestion by "A.B." in his letter of Oct. 16.

It was perhaps to be expected that the desirability of improvement should have occurred first to psychiatrists, but the general use today of the term "mental hospital" where other more frightening titles were in use only a few years back, shows that it is possible to make such changes. If it be objected that moneys are given or bequeathed and could not be claimed if the name were changed, I would suggest that there are ways round such a difficulty; even a private Act of Parliament should surely be possible to achieve a worth-while object like this.

That this suggestion by "A.B." is likely to appeal to you, Sir, is evident from the annotation on the Patients' Hospital in your issue of Feb. 21. Now that the need for the change has been pointed out, all those in a position to act will be glad to contribute to lightening the burden on patients and relatives of patients with "cancer," "consumption," and "incurable" maladies—a burden which it is not easy for doctors to appreciate.

Guy's Hospital, London, S.E.1. RONALD MAC KEITH.

HYALURONIDASE AND GONORRHŒAL INFECTION

SIR,—In 1929 Duran-Reynals[1] reported that the intradermal injection of testicular extract caused rapid dispersal of fluid, toxins, and particulate matter from the point of injection into the surrounding skin, and that extracts of other tissues had no such effect. This result, he suggested, was due to a change in the cells of the host brought about by some substance present in testicular extract which he termed the spreading factor. Later McClean[2] confirmed these results, and finally Chain and Duthie[3] produced evidence that the spreading factor was hyaluronidase, an enzyme which acts specifically on its substrate hyaluronic acid, which is present only in the skin, vitreous humour, and synovial fluid but absent from all other body tissues. Chain and Duthie, among others, also found that some bacterial cultures produced hyaluronidase, but they disagreed with the report of Meyer et al.[4] that hyaluronidase was present in extracts of some other tissues—e.g., ciliary body. They concluded that hyaluronidase in the body was present only in testicular extract and that bacterial contamination was responsible for the findings of Meyer et al. Finally Robertson et al.,[5] investigating cultures of various pathogens, reported that the gonococcus could not produce this enzyme.

The fact that the tissues associated with the enzyme and its substrate are the genital tract, eye, joints, and skin, which are also those affected in gonorrhœal infection, makes it difficult to believe that this association can be fortuitous. Further, the mode of invasion, the direction of spread, and the complications of gonorrhœal infection show that hyaluronidase may well play a very important part in this disease.

Invasion of the male anterior urethra by gonococci from the urethral orifice and their later extension to the posterior urethra, prostate, seminal vesicles, and epididymides is difficult to understand because (1) the gonococcus is non-motile; (2) the anterior urethra for some distance from its orifice is covered with a naturally resistant flattened epithelium, and a further barrier to proximal extension is found in the relatively resistant membranous portion; and (3) the natural direction of flow in the affected parts is distally. I suggest that the hyaluronidase in the spermatic fluid lining the urethra after coitus acts as a chemotaxic agent facilitating the spread of the infecting organisms to the non-resistant epithelium of the anterior urethra, which they penetrate, giving rise later to acute gonorrhœa. That hyaluronidase may act in this way is shown by the fact that, if two

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1. Duran-Reynals, F. *J. exp. Med.* 1929, 50, 327.
2. McClean, D. *J. Path. Bact.* 1930, 33, 1045; *Ibid*, 1931, 34, 459.
3. Chain, E., Duthie, E. S. *Nature, Lond.* 1939, 144, 977; *Brit. J. exp. Path.* 1940, 21, 324.
4. Meyer, K., Hobby, G. L., Chaffee, E., Dawson, M. H. *J. exp. Med.* 1940, 71, 137.
5. Robertson, W. V., Ropes, M. W., Bauer, W. *J. Biol. Chem.* 1940, 133, 261.

Gent. Alk. to symbolise my presence when I'm not there.

There are two things that endanger the practice of a high standard of medicine. Firstly, a list of 4000 doesn't give one the leisure to add that bit of sympathy and wisdom that comes with spaciousness. We should be encouraged by a high capitation fee for the first thousand, and decreasing amounts for the subsequent ones. Secondly, the minor specialties. During the war I became a graded psychiatrist, and learned a lot. But if I wish to give psychiatric treatment to patients on my list, and this implies hours of patient endeavour, I must do it for seventeen bob a year, or love. Likewise circumcisions. My patients like them done when the baby is a week old and the nurse still in attendance; they don't like *going* to hospital. Well, I *do some* for the love of it, but I'm only human, and the hospital lists will soon be more swollen than ever. (Jolly good job, you may say: G.P.'s should know their place and not try to be specialists.)

If you ask whether the doctor-patient relationship has been altered I say emphatically "No." Good or bad, it's the same as before and depends on the personalities of both.

P.S.—*An irritating side issue.* Why are patients told that the chemist will provide a bottle for every prescription? Doesn't this encourage waste and thriftlessness?

* * *

These hospitable columns record from time to time the experiences of the vast band of brothers seeking appointments. Lately we were given some advice on how to supply a photograph, and the reluctant conclusion was drawn that it was better to stick to a misty representation of one's own dial than to risk all on a photo of James Mason or Greer Garson. Now a new phenomenon has come to my notice—the psychological interview.

It appears that the psychologists, still flushed with triumph after selecting many thousands of Army officers (and they did very well, for all the officers I met, however young, could read and write and some of them had charming manners), are not content with organising house parties for the Civil Service, but are lending their skill to medical selection boards. The technique of the interview is strange. No waiting about in draughty corridors suspiciously eyeing other candidates, but formal introductions all round, free cigarettes, and reassuring talk about expenses from charming secretaries. The half dozen candidates and the selection board then settle themselves round a long table for several hours' discussion. Tea arrives and more cigarettes. By this time all suspicion is lulled and there is a friendly atmosphere comparable to that in a railway compartment where the train is not more than two or three hours late and no actual discomfort has yet been suffered.

At this point the candidate must exercise extreme vigilance, for now the psychologist will tenderly inquire whether those concerned approve of this method of selection. On no account say that you cannot see any point in the whole performance and would like to know the criteria of the selection committee. Comments of this sort merely reveal to the committee unpleasant traits of obstructionism and negativism which it is your duty, as a humble person merely seeking to earn your bread and butter, to conceal. Rather, confine your remarks to vaguely phrased but enthusiastic murmurs of appreciation.

On the whole I prefer the old-fashioned board, largely composed of unknown but obviously eminent lights of the profession, who treat one with grave courtesy for twenty minutes and then appoint the chap who has already held the job for two years.

* * *

In America there is everything in the shops which we used to have before the war, plus all that has been created by advancing technology. Perhaps one might advance the thesis, though, that the principal function of the man (and even more the woman) in the street, is that of consumer; an indispensable necessity to the manufacturer, for whom the world was created. At home, of course, there still lingers the notion that the world was created for the man in the street.

Letters to the Editor

INFANTILE GASTRO-ENTERITIS AND STREPTOMYCIN

SIR,—I have read with great interest the paper Dr. James and her colleagues (Oct. 9) and last wee letter by Dr. Anderson and others.

During the 1947 epidemic of infantile gastro-enter at Aberdeen, which involved 207 cases with a fatali rate of 50·6%, an extensive study of the ætiology of t condition was carried out, the first results of which w published earlier this year.[1] Two serologically disti types of *Bacterium coli* were isolated in close associat with the disease, and one of them was identical with organism described by Bray[2] in connexion with simi cases. This particular type was recovered in 94·7 of cases, and in only 1·8% of 721 controls. B organisms were found to be highly susceptible streptomycin in vitro, being inhibited by 0·4–0·8 per ml.

Later in the year Dr. C. Gibson, of the Presbyter Hospital in New York, sent a small quantity of strep mycin which enabled us to commence clinical tri with this antibiotic. Owing to the small number cases so far treated, results are as yet inconclusive, rapid clinical improvement took place more often treated than in untreated cases in the same epidem and this clinical improvement coincided with the compl disappearance from the stools of the coliform strains question. As Dr. Anderson and others have alre stressed, nearly all gram-negative organisms tend disappear from the fæces when streptomycin is exhib by mouth, and to a lesser extent when it is gi parenterally. It is true that *Bact. coli* as well as *Prot* and paracolon bacilli reappear soon after cessation streptomycin treatment, but in our own cases suspected types of *Bact. coli* did not recur and recov was uninterrupted.

During the first half of this year, at Stoke-on-Tre I isolated the same organisms in 25 out of 32 cases gastro-enteritis, most of which were fatal. Only 2 w treated with streptomycin; both patients were extrem ill on admission, both improved dramatically on strep mycin therapy, and in both the coliforms in questi disappeared and did not recur.

I should most warmly welcome the release of strep mycin for the purposes of investigating this form treatment.

C. GILES.

Pathology Department,
Stoke City General Hospital.

RECURRENT DISLOCATION OF THE SHOULDER

SIR,—Evidently Mr. Richardson is unfamiliar with n operation for recurrent dislocation of the shoulder, f in his article of Oct. 16 he has got it wrong in almo every detail and he has created a number of difficulti which in fact do not exist.

The cause of recurrent dislocation is avulsion of t capsule with or without the glenoid ligament from t anterior margin of the glenoid cavity, and the on rational treatment is to reattach the capsule to the bo from which it has been torn. Most of the cases occ in powerful athletic young men who have anything b weak muscles. I agree that bone lesions, when presen are the result and not the cause of the dislocatio They do not affect the treatment or the prognosi Mr. Richardson says:

1. "An attempt is made to repair the capsule." This incorrect. The capsule is divided over the glenoid marg and its cut edge is fixed to the bone which has been freshene to receive it.
2. "The lesion is situated deep down in a narrow woun which easily fills with blood." Inadequate exposure an imperfect hæmostasis are, next to sepsis, the commones causes of bad surgical results. In my operation the lesion i completely exposed and readily accessible, and every bleeding point can be seen and controlled. It is not true that

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[1] Giles, C., Sangster, G. *J. Hyg., Camb.* 1948, 46, 1.

[2] Bray, J. *J. Path. Bact.* 1945, 57, 239.

instance, it does not seem probable that the gas breathed was ordinary air. Further information on this point would be very welcome.

Office of the Surgeon-General.
Royal Swedish Navy, Stockholm.
GUSTAF SEVERIN.

DOSAGE OF SULPHETRONE FOR CHILDREN

SIR,—In 'Sulphetrone' treatment a blood-level of between 7 and 10 mg. per 100 ml. would seem to be desirable. The dose recommended for children under years of age given in published papers[1] and by the manufacturers is 0·5 g. daily for the first week and 1 g. daily for the second week.

Of two children under 4 years of age treated with Sulphetrone in this hospital, one, aged 2 years, weighed kg., and the other aged 3 years, weighed 11·5 kg. In these children the dosage was gradually increased till a blood-level of 7–10 mg. per 100 ml. was obtained. The first child required 6 g. and the second 3 g. of the drug daily. This dose would correspond to a dose of about 24 g. and 16 g. per day in an average adult.

Thus it would seem necessary to step up the dosage of sulphetrone in young children, in the light of blood estimations, as the optimum dose may be relatively high.

Department of Pathology,
Children's Hospital, Sheffield.
J. L. EMERY.

PRODUCTION OF INSULIN

SIR,—The four British manufacturers of insulin—namely, Allen & Hanburys, Boots Pure Drug Co., British Drug Houses, and Burroughs, Wellcome & Co.—are a little concerned lest the annotation in your issue of . 9 might lead to certain misleading conclusions. I should like to quote from a letter by me in the *Times* of July 23.

"... I would like to comment on the article from your Medical Correspondent entitled 'Need For More Insulin' which appeared in your issue of July 16 and which referred to the report on insulin in the April issue of the *Chronicle of the World Health Organization*. Production of insulin in this country is adequate to meet in full both home and export demands, and ample stocks are always maintained in this country. The implication in the report that the United States has only a small exportable surplus is surprising, as British manufacturers are meeting active American competition in most of the important markets of the world and are having to fight hard to maintain their own exports of insulin. Great advances have been made in the yield of insulin from pancreas as a result of the collaboration of our research teams, and there will be no relaxation of our combined efforts to achieve even better yields. The methods of collection of pancreas stated to have been recently discovered in Germany have in fact been widely known for some time; they are at best a makeshift. Immediate refrigeration of pancreas glands on removal from the animal is still a necessity if the best yields of insulin are to be obtained, and it is important that no one should get the impression that pancreas should be collected in this country other than under ideal conditions. Finally, we would emphasize that our production facilities alone could provide at least double the present quantity of insulin produced if the demand for it should arise."

There is every reason to suppose that the methods of collection being used in Germany are merely designed to ensure that pancreas is not totally wasted in slaughterhouses where adequate refrigeration facilities are not available.

Ware, Herts.
JOHN C. HANBURY
Chairman, British Insulin Manufacturers.

PSYCHOGENIC RHEUMATISM

SIR,—I regret that I did not have an opportunity of hearing Dr. Philip Hench's lecture on psychogenic rheumatism, annotated in your columns on Oct. 23. It would be interesting, however, to learn how many of the large number of clinicians who too commonly diagnose psychogenic rheumatism have ever taken the trouble to dissect out the spinal joints post mortem. They must be extremely few. Meanwhile, the post-mortem appearances of hysteria remain protean.

London, N.4.
I. H. MILNER.

PROPRIETARY MEDICINES UNDER THE NATIONAL HEALTH SERVICE ACT

SIR,—I am afraid Mr. Godding's reply to my letter rather obscures the issue. He has given the usual accepted definition of "ethical," but has failed to point out that there are many borderline cases. In giving the doctor carte-blanche to order proprietaries, provided he can justify the prescribing, the authorities have avoided this difficulty and shown their confidence in the doctors. Mr. Godding's article did not state that the proprietary articles ordered on N.H.I. and private prescriptions were all of the truly ethical type. The comparison N.H.I./private is now of course invalid, since the two are merged, and data collected by the *Chemist & Druggist* after July 5 over the whole country suggested that doctors were not wholly ignorant of their right to prescribe proprietary articles.

I suggest, Sir, that a lot of the research ascribed to proprietary articles is attributable to ethical proprietaries of the truest form, which we are agreed receive proper support; and that to introduce other proprietary articles needs—apart from normal business financing—no special research. No doubt there are some pages of the book left closed when claims of this sort are made. How many different compounds of aspirin and codeine are on the market under different trade names?

It is up to the authorities, when reviewing the cost of the N.H.S., to decide what future policy to adopt; and it is clear that the trade interests will make their views felt. But if Mr. Godding and other manufacturers were to stimulate, by intensive advertising, the prescribing of proprietary medicines at present they would probably prejudice their own future. Prescribing such as that cited by Mr. H. Davis, D.SC., at the National Association of Women Pharmacists' meeting on Sept. 22 is bound to have unfortunate results.

I still feel that the Chemists Federation cannot properly undertake the therapeutic assessment of proprietary medicines. In order to improve its own standing, I think the C.F. would be well-advised to drop price protection, and leave that to the Proprietary Articles Trade Association. This would at any rate mean that items on the C.F. list were accepted on merit. Also it would mean, in my view, that the C.F. would be more seriously considered by some of the eminent pharmaceutical manufacturers who do not wish to be included in the list at present.

With careful reading of my contributions to this question, I think Mr. Godding will agree that there is no real fundamental divergence of views. I shall be happy to place before him in confidence those of the C.F. articles which are, in my view, undesirable.

In closing may I say that I have just seen a publication "Bayer Products/N.H.S." May I congratulate this firm on having sufficient confidence to give this information in the form stated.

Seaham.
A. FORSTER.

COMPULSORY ADMISSION

SIR,—X.Y.'s letter of Oct. 23 is opportune. In London, the problem of gaining admission to hospital for the elderly patient exists with regard to acute as well as chronic illness. It is well known that the Emergency Bed Service often has great difficulty in finding a bed for a patient over 70, even when the only doctor who has examined him has certified that he requires urgent admission. Some hospitals are more coöperative than others, so the burden of these patients is apt to fall on the "willing horse": for example, a hospital has recently admitted, from as far as twenty miles away, a man of 72 with a strangulated hernia, a woman of 81 in coma, and a case of abortion. In each case the E.B.S. had been refused admission for these patients by 15–20 other hospitals situated nearer to the patients' homes.

Unless hospital medical staffs become more coöperative, so as to solve this problem rapidly for themselves, it will obviously be necessary for a higher authority to give a definite directive allocating the responsibility for all unwanted patients in a specified area to individual hospitals or hospital groups.

London, N.10.
T. ST. M. NORRIS.

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[1] Madigan, D. G. *Lancet*, July 31, p. 174.

culture tubes, one containing hyaluronidase and the other not, are placed in a medium containing organisms, the organisms tend to accumulate about the mouth of, and invade, the tube containing hyaluronidase. With the onset of acute urethritis favourable conditions exist for the infection to overcome the barrier presented by the membranous portion of the urethra, since priapism and its accompanying automatic secretion of spermatic fluid are common features of this stage of gonorrhœa. Direct spread to prostate and vesicles follows naturally, and extension to the epididymides is more satisfactorily explained on this hypothesis than by either the accidental entrance of infected urine via the vas deferens or by lymphatic spread.

The complications of gonorrhœa—iritis, rheumatism, and keratodermia—are always associated with extension of the gonococcal infection to prostate, vesicles, an epididymides, where drainage is poor owing to anatomical structure. Therefore it seems reasonable to suggest that, owing to poor drainage, hyaluronidase and organisms are absorbed into the blood-stream, act on the susceptible tissues (containing the substrate hyaluronic acid), and so bring about the known pathological changes.

Apart from gonorrhœa, there may be a wider pathological significance in hyaluronidase and its substrate, since clinical experience shows that the removal of septic foci is followed by cure in some cases of rheumatism. It would be of interest to know if the infecting organisms in these cases could produce hyaluronidase, since Robertson et al.[5] showed that some strains of pathogens—e.g., streptococci and *Cl. welchii*—produced hyaluronidase in culture, and they suggested that it might play a part in rheumatoid arthritis. The latter possibility will, I feel sure, be found to be incorrect; on the other hand, the isolation of a group within the rheumatic diseases may be shown to depend on a hyaluronidase-producing organism from a septic focus. The fact that bee venom is a traditional therapeutic agent in the treatment of rheumatism and contains hyaluronidase suggests that the results of this treatment are possibly due to the formation of an anti-hyaluronidase.

London, W.1. F. L. LYDON.

DENTURES AND ANÆSTHESIA

SIR,—As one who has been engaged in making artificial dentures for thirty-six years, and who has been interested and engaged in administering anæsthetics for dental operations, I would like to enter an emphatic protest against Dr. Parry-Price's[1] practice of leaving dentures in place during anæsthesia. Any dentist or dental mechanic of experience will agree that no denture material yet made can be guaranteed against chipping. There is surely enough risk of portions of natural teeth and fillings becoming detached, without adding to the danger with pieces of porcelain or acrylic resin (the latter, by the way, being opaque to X ray).

For some time I have noticed that either face-piece or nose-piece obstructs the breathing by its very pressure on the levator nasi muscle—an observation confirmed by anæsthetists to whom I have spoken. Consequently, I am endeavouring to devise an inhaler in the form of a metal or plastic box which would rest upon the forehead, its top end plugging directly into the large-bore tube of the anæsthetic apparatus, and having at its lower end two soft metal tubes, bent so as to enter the nostrils, each fitted with a soft rubber "stall" to ensure an air-tight fit and prevent damage. Such an inhaler would, I think, not only overcome the stifling feeling that our patients complain of, but always maintain a good airway, no matter how hollow the patient's cheeks.

Lyme Regis. ERNEST H. PHILLIPS.

SIR,—Every anæsthetist must sympathise with Dr. Parry-Price in the difficulties he mentioned in his letter last week, and he is to be congratulated on his experience of leaving full dentures in position during anæsthesia. Unfortunately not every anæsthetist is careful, and all are human, and I cannot help feeling that it is better that nurses should still be taught that all dentures should be removed before operation, than that the occasional single tooth should slip into the trachea; certainly an exception might be made in the case of th patient who strongly objects on cosmetic grounds. D G. J. Rees and I described in THE LANCET (Feb. 21) buccal support for the edentulous which we felt was adequate as, and yet safer than, a full denture.

I confess that I have more confidence in passing laryngoscope in an edentulous patient than in t presence of a full set of teeth.

St. George's Hospital,
London, S.W.1.
D. D. C. HOWAT
Anæsthetics First Assistant.

CAROTID-SINUS SYNDROME

SIR,—From the point of view of clinical diagno the case described last week by Dr. Turner and Profes Learmonth is interesting: They certainly proved th this man had a hypersensitive carotid-sinus reflex, b I am not so sure that his attacks of intense verti staggering, and vomiting were due to this. These a not the symptoms usually produced by cardiac asysto and this man's spontaneous attacks never seem to ha followed the usual pattern of syncope or convulsio In my experience it is very difficult to assert that labyrinthine cause of vertigo is excluded: tinnitus a deafness may not occur till much later, and I doubt tests are decisive. Remissions of labyrinthine vert may last for months or years.

I venture to think that the diagnosis in this c remains in some doubt.

Newcastle-on-Tyne. F. J. NATTRASS

DEEPER AND DEEPER

SIR,—In your issue of Sept. 4 (p. 390) I read w interest that a British diver, Petty Officer Bolla reached a depth of 535 ft. in Loch Fyne on Aug. thereby beating the former record for deep diving set in 1945 by the young Swedish engineer and diver, A Zetterström. Mr. Bollard and the Royal Navy, wh has always contributed in such a splendid way to t development of diving, are to be congratulated on a n and extremely good achievement.

I am, however, anxious to make some comments a corrections to your note. When the dive during wh Zetterström died was made on Aug. 7, 1945, the de reached was not 480 ft. but 525 ft. (160 metre Zetterström made this descent, as he had so oft before, using a synthetic gas mixture (hydrogen wi 4% oxygen) of his own invention. He died on his w to the surface. It should, however, be emphasised th his death was not due to any inherent deficiency in t method. He attained the great depth aimed at witho difficulty, and at that time this depth, of 160 metres, w the world record for open-sea diving in a flexible divin suit. The ascent also proceeded quite normally at fir Owing to a grave mistake on board the diver's boat wire (guy) attached to the diving platform was broug home too rapidly and not in accordance with t previously calculated decompression tables. From depth of approximately 164 ft. (50 metres) the div was thus suddenly brought directly to the surfac Zetterström died from acute lack of oxygen and viole decompression sickness.

Two articles have lately been published on the Zette ström method for deep diving with hydrogen. One these is a translation of a paper written in 1945 Zetterström himself[1]; in the other Bjurstedt a Severin[2] discuss the physiological aspects of t method.

As far as I am aware, 535 ft. is still the world reco for open-sea deep diving. However, it may be pointe out that Behnke, in a report (1947) from the U.S. Nav Medical Research Institute, Bethesda, entitled "A revie of physiologic and clinical data pertaining to decom pression sickness," mentions a simulated dive to a dept of 550 ft. in a wet pressure tank in April, 194 A helium-oxygen mixture was breathed and the dive remained in good condition throughout the period of th dive and afterwards.

Your short notice does not mention the kind of g mixture breathed by Mr. Bollard. In view, however, o the narcotic effect of nitrogen and the great breathin tance. it does not seem probable that the gas used was ordinary air. Further information on this point would be very welcome.

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[1] *Lancet*, Oct. 23, p. 670.

[1] *Milit. Surg.* 1948, 103, 101.
[2] Bjurstedt, H., Severin, E. *Ibid*, p. 107.

Office of the Surgeon-General. Royal Swedish Navy, Stockholm. GUSTAF SEVERIN.

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Seaham. A. FORSTER.

COMPULSORY ADMISSION

SIR,—X.Y.'s letter of Oct. 23 is opportune. In London, the problem of gaining admission to hospital for the elderly patient exists with regard to acute as well as chronic illness. It is well known that the Emergency Bed Service often has great difficulty in finding a bed for a patient over 70, even when the only doctor who has examined him has certified that he requires urgent admission. Some hospitals are more coöperative than others, so the burden of these patients is apt to fall on the "willing horse": for example, a hospital has recently admitted, from as far as twenty miles away, a man of 72 with a strangulated hernia, a woman of 81 in coma, and a case of abortion. In each case the E.B.S. had been refused admission for these patients by 15–20 other hospitals situated nearer to the patients' homes.

Unless hospital medical staffs become more coöperative, so as to solve this problem rapidly for themselves, it will obviously be necessary for a higher authority to give a definite directive allocating the responsibility for all unwanted patients in a specified area to individual hospitals or hospital groups.

London, N.19. T. ST. M. NORRIS.

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[1] Madigan, D. G. *Lancet*, July 31, p. 174.

CONVALESCENCE: FEE OR FREE?

SIR,—Since July 5 the arrangements for providing children with convalescent treatment have been changed; as the new machinery comes into use, certain defects have appeared. Before that date convalescent treatment for school-children (at least in London) was largely provided through the Invalid Children's Aid Association, though much of the actual cost was defrayed by local education authorities. The system worked reasonably well. The association accumulated a good deal of information about the convalescent homes, which enabled them to place the children in the appropriate ones, and the education authorities accepted their responsibility to pay. It was with the laudable intention of removing this burden from the rates to the national exchequer that the new procedure was set up in the National Health Service Act.

The Ministry of Health has classified the former convalescent homes into two groups: (1) "holiday homes," where medical and nursing treatment is not provided, and (2) "convalescent homes," where such treatment is provided. The second group has been taken over by the regional boards, but the first group has not. So treatment in a convalescent home is free; but when given in a holiday home somebody has to pay the bill—the parents if they can afford it, or else the education authority or a charitable fund. This puts a school medical officer in a difficult position when he has to decide which type of home to recommend for a convalescent child—either a convalescent home, maintained by national funds, or a holiday home, when his own authority may be asked to foot the bill. His inclination to plump for the former will be reinforced by two powerful arguments. First, some authorities, thinking that all convalescent treatment would be free, have made no financial provision for it after the appointed day; and secondly, it is hard to see what sort of convalescent can do without medical and nursing treatment. The sequel might have been foreseen: convalescent homes have long waiting-lists, holiday homes stand empty; and the children suffer.

Other anomalies have arisen. Some holiday homes do provide treatment for some of their patients—e.g., they may have a ward reserved for heart disease. A child sent here will have to be paid for, though exactly the same treatment in a neighbouring institution would be free. Accommodation for this type of patient is scarce, so these wards should not be closed. It is not yet clear whether regional boards will arrange all convalescent treatment centrally, or will leave hospital and local-authority welfare services to find accommodation directly with the homes. In either case, the valuable knowledge garnered by the I.C.A.A. through years of experience is likely to be lost.

I appreciate that these difficulties are the teething troubles of the new scheme, and I point them out in the belief that it is best to do so early while procedure is still fluid.

Whipps Cross Hospital, London, E.11. E. HINDEN.

*** As we remarked in an annotation on July 24 (p. 153), it is clearly contrary to the principles of the Act that some patients should have to pay for a period of recuperation in a home when others do not; and it seems an unnecessary complication that the cost of holiday homes should fall on local authorities while that of convalescent homes is met by the regional boards. Our suggestion that other hospitals should follow the lead of some teaching ones in paying the holiday-home fees for their own convalescents would still leave a large class of convalescent children unprovided for.—ED. L.

LETTER TO A NEPHEW

SIR,—The final paragraph in the original letter (pre-Nelson) proves the author so sensible of true values that it should dismiss X.Y.Z.'s fears. These arose from a few earlier phrases, directed, I think, against "narrow-minded fanaticism," rather than the following of the vocation of healing—a very practical idealism, involving a deliberate devotion to the relief and encouragement of fellow men and women in distress. Our profession, most of all that of a general practitioner, gives supreme opportunities of generous response to human need suffering. Yet the patient needs something more t his doctor's devotion: he needs his wisdom, his skill, his character of truth and honour. These are fruits toil and resolution. Thomas à Kempis says truly: " doeth much that loveth much," but immediately ad "He doeth much, that doeth a thing well."

G. R. G

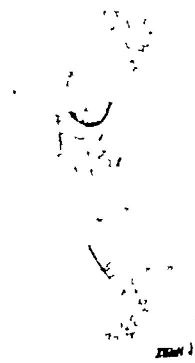
Obituary

PERCIVAL PASLEY COLE

O.B.E., M.B. BIRM., F.R.C.S., L.D.S.

Mr. P. P. Cole, whose death on Oct. 19 we announ last week, made his mark as a surgeon of wide inter who contributed particularly to plastic surgery and surgery of hernia. Much of his professional life devoted to the welfare of seamen, and two years ago was elected an honorary member of the National Un of Seamen.

Born seventy years ago at Weymouth, he received early education at Weymouth College, from which went on to Guy's Hospital. He qualified as a dental surgeon in 1899, and five years later took the Conjoint qualification. After house-appointments at his parent hospital he passed the examination to become, in 1906, F.R.C.S. Three years later he graduated as M.B. at Birmingham, where he had gone as lecturer in anatomy. He returned to London in 1910 as demonstrator of anatomy at the Middlesex Hospital; and in the two years which followed he was appointed surgeon to Queen Mary's Hospital for the East End, surgical registrar at the Royal Cancer Hospital, and assistant surgeon to the Dreadnought Hospital. The association with these three hospitals continued through his life.



During the first world war Cole turned his de training to good account in the treatment of maxil facial injuries at King George's Hospital, Waterloo Ro he also served as surgeon at the Brook War Hospit In 1919 he succeeded C. C. Choyce as dean of the Lond School of Clinical Medicine, which had been establis at Greenwich in 1910. Here he gave special thought the postgraduate training of ship's surgeons, provid for them opportunities to reside in hospital during th periods of leave. Latterly he took an important part the revision of the *Ship Captain's Medical Gui* originally composed seventy years ago by the medi superintendent of the Dreadnought Hospital Ship— forerunner of the shore hospital.

A. D. recalls that, in order to gain closer knowled of seamen's needs, Cole himself went to sea as a shi surgeon. "Out of this knowledge and experience strove constantly to enhance the status and prestige ship's surgeons, in association with Gwynne Maitl and other medical superintendents of the shipping co panies." He also campaigned for the establishment a diploma for ship's surgeons; but this scheme, wh well advanced, was interrupted by the second wor war. During the war his retirement from the Roy Cancer Hospital was deferred; he continued as surg and venereologist at the Seamen's Hospital; and h gave valuable assistance as superintendent in the E.M. In 1946 he retired from the active staff of the Roy Cancer Hospital, and in 1947 from the Dreadnough Hospital. In 1947 he was appointed O.B.E., and th year he was elected a vice-president of the Seamen Hospital Society.

"Cole's interest in surgery was broad," writes A. H. H "but there were two main channels into which h activities became directed—the filigree operation fo inguinal herniæ and plastic surgery. The former was inheritance from McGavin at the Seamen's Hospit but it was Cole's dexterity which perfected the operation, and his lucid writings on the subject which brought it to the attention of surgeons and kept it in focus during a phase of surgical development in which the use of non-absorbable suture material was at a discount. His valuable work on plastic surgery is recorded in various articles on war wounds and injuries, the reparative surgery of the upper limb, and the surgery of the jaw and face. He blended this knowledge and skill in plastic surgery with an intimate understanding of the pathology and treatment of malignant disease. 'Cancer is indivisible,' was a favourite dictum, and he was a persistent advocate of team-work. His opinion, planned treatment, and operative skill in cancer of the face, scalp, and mouth was of great value in an institution such as the Royal Cancer Hospital where he continued with this work up to a short time before his death. His last contribution to the literature, published three months ago, concerned such a case. At the age of 70 he still possessed an active mind filled with original ideas based on sound and logical principles.

"His forthright statements and unwavering principles caused him to be respected by all who worked with him. His fearless, honest, and single-minded approach to all difficulties sometimes made his passage through life bulent, but his sense of justice and tolerance won for a lasting admiration and affection."

He is survived by the son and daughter of his first riage, and by his second wife, Dr. M. P. C. Greene. memorial service is to be held at the Royal Cancer pital this Saturday, Oct. 30, at 11 A.M.

HENRY SMITH

C.I.E., M.D. R.U.I.

the early years of this century many ophthalmo-ts visited India to study Henry Smith's work at his pital at Jullundur on the surgery of cataract extrac-, and in his monograph published in India in 1910 t.-Colonel Smith described his operation for intra-lar extraction of the crystalline lens. After his ment he published a revised edition in 1928 which t the improvements he had devised on this original ique.

Colonel Smith was born in Clogher, co. Tyrone, in , and was educated at Queen's College, Galway, and Royal University of Ireland, where he graduated in dicine in 1888. Two years later he joined the Indian dical Service, and he served in the Punjab until his tirement.

In the 1914–18 war he was appointed consulting ophthalmologist in Mesopotamia, and in 1921 he returned to England and settled in Sidcup, where he continued to write and practise. Accompanied by his son, Dr. Joseph Smith, he revisited India and later Dr. Barraquer in Spain. After his tour of the United States, where he won honour, affection, and many followers, he re-edited his book on cataract. With the graphic illustrations by Dr. Darrick Vail, and mathematical considerations by his son, it has become a classic. The ill health of his wife and of his son, and their need of continuous care which he undertook, led him to return to his birthplace in Northern Ireland, where he died, on Feb. 29, in his th year.

One of his American friends writes: "Colonel Smith stood six foot four, mentally, physically, and morally. Big, handsome, and impressive, he possessed a wise sense of humour, a combative versatility, and a pair of hands that were well-nigh perfect surgical instruments. As a practical anatomist he was convincingly logical, and his sensitiveness to tissue response was uncanny. These characteristics led him to find in his general surgery the conclusive argument for intracapsular rather than extracapsular extraction of the lens, and, with the utilisation of enormous material, to conquer both difficulty and opposition. He maintained that accidental and traumatic expulsion of the lens in capsule had, willy-nilly, demonstrated that here as elsewhere, complete removal of diseased or useless tissue, where possible, is correct surgery. He sought and perfected a definite technique, and dismissed the objections of difficulty and danger as fear and insufficient skill which time and practice would banish. . . . His lifelong battle began on the plains of India. This appreciation is born in the new world. East and West pay tribute."

Colonel Smith married Miss H. D. Russell and they had two sons.

THE LATE DR. WESTERN

G. T. Western (known as "Daddy" or "Father" by his friends of both sexes) was a remarkable character. At the London Hospital this was known only to his intimate friends; the life of a bacteriologist at the medical school of a big teaching hospital is apt to be rather impersonal. But all his splendid qualities came into play at St. Hugh's, the Military Hospital for Head Injuries, to which he came from retirement in 1940 as a lieutenant aged 63. He became an institution, a man of whom many stories are still told by men who were at St. Hugh's. Everything that he undertook was done with an unusual degree of competence. Although much of his life was spent in London he was a man of the country, a craftsman steeped in country lore, which he had matched with his practical knowledge of science and his sense of business. He understood the ways of bees, how to keep oatmeal, where to buy the best saws, how to fell trees, how to store apples, how to keep the badgers from his hens, how to draw blood from the smallest veins, and so on. His standards never deviated.

At St. Hugh's he ran his laboratory easily, conserving its staff from threats of posting with a morose and almost savage effectiveness. He found time for many other things: he ran the Officers' Mess with supreme efficiency, grew vegetables on its lawn, chopped its wood, and tended bees for the Mess and for various Oxford matrons. At this stage of his life, though he was still a highly competent bacteriologist, bees interested him more than bacteria. He did the Mess shopping in a way that gained the respect if not the approval of Oxford tradesmen. Said one lady to a local shopkeeper, "Do you know Major Western, the bee expert?" "B— expert," said the shopkeeper ruefully, "Yes, that's just about what he is!" He established a record for low cost-of-living in Officers' Messes and imposed his rigorous way of life—open windows, meagre fires, no black market, no second helpings—with unbending firmness upon a highly individualistic group of neurologists. To everyone he was at times intimidating, with a short and very direct comment followed by a prolonged and penetrating, reproachful stare over the top of his spectacles. Severe reprimands to all, regardless of rank, endeared him to junior officers. All knew that his bark was worse than his bite, that he was the kindest, fairest, most unselfish, and most generous of men, ungrudging in his service to them and to the hospital. This spartan life was part of his war against Hitler. He was an unbreakable rock, as could be felt by all in the bad days of 1940, and again when he had news that his son's cruiser had been sunk, followed, after a weekend of darkness, by a cable that all was well. By his qualities and his work he contributed greatly to the success of the hospital. All at St. Hugh's would hope that in his Heaven there is a garden with woodlands and fruit trees, well-stocked beehives, a capacious tool-shed, and some fellow enthusiasts not as expert as himself.

H. C.

Appointments

LYONS, JOSEPH, M.B. Leeds, D.P.H.: M.O.H. and divisional M.D., West Riding, Yorks.

Colonial Service:

CACHIA, C., M.D., B.SC.: M.O., Kenya.
DOUGLAS, E. S. M., L.R.C.P.E.: acting M.O., Jamaica.
EGWUATU, S. O., M.B. N.U.I.: M.O., Nigeria.
LAVOIPIERRE, J. A. R., M.D. Paris, D.T.M., D.P.H.: deputy director of medical services, Mauritius.
LAYCOCK, H. T., M.A., M.B. Camb., F.R.C.S.: M.O. (surgical), British Somaliland.
O'MAHONEY, J. P., M.B. N.U.I.: chief M.O., Barbados.
PAGE, H. G., O.B.E., M.B. Edin., F.R.C.S., M.R.C.O.G.: surgeon specialist, Grenada, Windward Islands.
PEAT, A. A., M.B. Aberd.: director of medical services, Trinidad.
STEVENS, C. E. E., M.B. Belf., F.R.C.S.E.: superintendent, Cunningham Hospital, St. Christopher-Nevis.
STOBBS, J. E., M.B. Durh.: M.O., Nigeria.
STRISIVER, E. V., M.D. Berlin: M.O., special grade, Sierra Leone.
TOMLINSON, C. H., M.B. Edin.: radiologist, medical department, Jamaica.

Notes and News

TRAINING GRANTS FOR ASSISTANTS

THE Minister of Health has now notified executive councils of the terms under which practitioners may engage assistants for training under a system of Government grants; and he has suggested that principals should be invited to submit applications to take part in the scheme. The conditions are those outlined in last week's annotation (p. 656); and the announcement makes it clear that the practitioner whose application is approved will himself be responsible for appointing the assistant and for satisfying the executive council that the candidate appointed has not previously been in practice in the British Isles.

GLASGOW AND ITS ROYAL FACULTY

AT a meeting of the Scottish Society of the History of Medicine held in Glasgow on Oct. 20 with Dr. Douglas Guthrie in the chair, Prof. J. D. Mackie said that the University of Glasgow, founded in 1451, was at first modelled on French lines, but after the Reformation was reorganised by Andrew Melville. Mr. A. C. Goodall, librarian of the Royal Faculty of Physicians and Surgeons, said that the faculty was unique among medical corporations in this country in uniting surgeons with physicians. Founded in 1599 by Maister Peter Lowe it received its charter from James VI the same year. Among its many duties were the examination and licensing of all surgeons in the West of Scotland, supervision of their conduct, and ensuring the high quality of drugs. A service of free medical aid to the poor of the city was another noteworthy feature of the activities of the faculty, which next year will celebrate its 350th anniversary.

ICY CHRISTMAS

A BAD harvest nowadays is a disaster for the whole world; and the news that this year the granaries would be filled has been the one cheerful flourish in an otherwise bleak and only too convincing narrative of man's follies and misfortunes. In Labrador, where food is scarce at any time, the harvest is more elusive than elsewhere, being apt to swim off. For two summers fish have been scarce, and on land there have been few fur-bearing animals. This means a hard winter for the fisherman, hunters, and trappers, and their children. They will be hungry again, and cold. Many of their dogs, on which they depend for transport, have died, and more will die this year. The wooden hospitals and nursing stations, which have withstood forty years of arctic storms, need rebuilding; they are fuller than ever and badly need new X-ray equipment to help in the fight against tuberculosis, now on the increase.

The Grenfell Association, founded by Wilfred Grenfell to undertake medical work among British settlers in Labrador and Northern Newfoundland, has many friends on both sides of the Atlantic who like to help in its heavy and necessary task. One way to do it is to send out Grenfell Christmas cards, which are again available this year. The cards carry simple greetings only, and include several in colour: they range in price from 1*s*. 2*d*. to 6*d*. each, and there are also packets of six postcards at 2*s*. a packet, packets of six Christmas labels at 9*d*., and some pleasant purse calendars at 3*d*. each; postage is extra. They may be bought from the Secretary, Grenfell Association, 56, Victoria Street, London, S.W.1.

PREVENTION OF DEAFNESS

IN the autumn of 1946, in the town of Lund, Dr. Nils Lundgren[1] examined 1426 children in the public elementary schools and found that 15–16% were more or less deaf on one or both sides. *Nordisk Medicin*[2] points out that in the national schools in Stockholm it has long been customary to test the hearing of each child once a year. In principle, the teacher who finds that a child cannot hear whispering at a distance of less than 3 metres on one side or other must report this to a school doctor. In Stockholm provision is made for the examination of deaf children once a week, and when enlarged adenoids are found they are removed. A somewhat similar system is in operation in Göteborg, Malmö, Lund, and Norrköping, but elsewhere in Sweden early cases of deafness are largely neglected, and often the patient does not see specialist till his disability has become permanent. In th near future it is hoped that all the teeth of every Swedis child will be examined once or twice every year by a dentist and it may be asked why there is no equivalent measure fo the early detection and treatment of deafness. A child' lost teeth can to a certain extent be replaced by denture but there is no such effective substitute for good ears. D Lundgren writes: "It is just as necessary for the otolaryngologist to examine the nasopharynx, tympana, and hearing children once or twice a year in order to preserve their hearin as it is for the dentist to examine teeth at regular interv

Rh

Dr. Alexander Wiener, of New York, has circulated t various libraries bound copies of some of his contributions t the work on the rhesus factor. As he was, with Landsteine one of the original discoverers of this factor, the original pape are here reproduced; the latest reprint is from a journ dated April, 1948. Those who are studying the subje will be glad to have so much actual source material t conveniently presented. Some idea of the size of the literature that has grown up about Rh factors in a short time m be gathered from the bibliography of contributions fro Dr. Wiener and co-workers, which total 179 papers publishe with another 6 in the press. From the papers many mo key references can be gathered.

FOOD RATIONS IN GERMANY AND AUSTRIA

ACCORDING to figures issued by Economic Coöperati Administration, the normal consumer ration in the Bizo of Germany now yields about 1850 calories per day, whil the new ration for miners affords 4000 calories daily. T monthly meat ration is 300 g., compared with 100 g. la March. The over-all non-farm ration averages 2150 calori —a 15% improvement on the average a year ago. It pointed out that before the late war Germany import more than a third of her food. Moreover, it is expect that at the end of this year the combined population of t two zones will be 44 million, whereas before the war it w 34·2 million.

In Austria the normal ration was raised last month fro 1800 to 2100 calories a day. Additional food allocated workers in heavy industries has brought the average for t urban population up to 2300 calories; and in 1948–4 the average is expected to reach 2500–2600. In both countri the crops are very considerably better than last year.

THE HAVEN PRODUCTS SCHEME

THE success of a sheltered workshop turns on the goo spirit of the workers; and this derives from their sense personal achievement. Since to depend on charity alway saps morale, the best sheltered workshops are those whic are economically sound and pay a wage which owes nothin to outside benefactions. A particularly successful exampl is Haven Products,[1] opened on the Scottish Industrial Estat at Hillington, Clydeside, in 1946. The scheme was begu by doctors, social workers, and industrialists, all of who accepted the principle of community responsibility for Servic and industrial casualties. Most of the £6000 needed to sta the enterprise was subscribed by industrialists on the estat Later the project was incorporated as a private compan in which profits, instead of being distributed to shareholder go back into the workshop. The main work offered is th making of electrically heated pads and blankets; and Mess Thermega, who for many years, at Leatherhead, have bee employing ex-Servicemen with neuroses in the manufactur of this equipment, offered a subcontract on favourable terms

At Hillington the machines provided had to be speciall modified for the use of physically disabled men, benche had to be designed to allow the chair-bound worker to ge into a comfortable position, doors had to be wide enough to let invalid chairs pass easily, rest-rooms were needed, and water-closets had to be fitted with supporting rails. The place is cheerfully decorated and meals are available in a cafeteria on the ground floor.

The workshop opened in March, 1946, with two foremen, one storekeeper, and a manager. A week later 14 severel disabled men were in training, and there are now 45 at work.

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1. *Nord. Med.* May 21, 1948, p. 1015.
2. *Ibid*, p. 1060.

1. Haven Products. By A. E. TURNER, T. A. STIRRAT, and Prof. T. FERGUSON, M.D. Brochure published by the Nuffield Provincial Hospitals Trust, 12 and 13 Mecklenburgh Square, London, W.C.1.

with multiple disabilities. They work an 8-hour day on days a week and earn a basic wage of 2*s.* 1½*d.* an hour plus bonuses. At present their homes are widely scattered, and they come to work by ambulance, motor chair, or public transport; but the Scottish branch of the British Red Cross is contributing funds to provide 20 houses for ex-Servicemen, through the Scottish Veterans' Garden City Association. The labour force was built up gradually as production developed.

Most of the men are severely disabled as a result of gunshot wounds of the head or spine, or such conditions as organic disease of the nervous system, heart disease, nephritis, rheumatoid arthritis, congenital muscular wasting, and amputations The average age is thirty-two, and 25 are married. In many cases an opportunity to earn a living has meant a complete change in outlook for the disabled man, from angry despair to keenness and self-confidence; and the workshop has about it an atmosphere which expresses the enthusiasm and sense of corporate life found among those employed there. As one of them wrote: "I know you'll appreciate how I feel at being able to keep the home fires burning off my own bat."

University of Oxford

On Oct. 14 the following degrees were conferred:

M.Ch.—E. G. Tuckwell.*
D.M.—E. J. E. Jones, R. G. Chambers, Zaida M. Megrah, C. Toynbee, H. A. Evans,* A. R. Wilson,* J. W. Platt,* C. Cox.*

* In absentia.

University of Cambridge

On Oct. 16 the following degrees were conferred:

M.D.—O. C. Lloyd.
M.B., *B.Chir.*—Hugh Middleton,* John Wedgwood,* N. R. [illegible],* Adrian Hill,* I. C. Peebles.*

* By proxy.

University of London

Dr. H. R. Ing, D.PHIL., will give a lecture at the London School of Hygiene, Keppel Street, W.C.1, on Friday, Dec. 3, at 5.15 P.M. He is to speak on the Pharmacology of Homologous Series.

University of Liverpool

Dr. Alexander Macdonald has been appointed to a readership in the department of bacteriology at the school of hygiene.

On Wednesday, Nov. 3, at 5 P.M., in the arts theatre of the University, Dr. Edward D. Churchill, John Homans professor of surgery at Harvard University, will deliver the William Mitchell Banks lecture. His subject is to be Wounds of the Chest—a Study of the Evolution of Method in Surgery.

University of Leeds

Dr. S. J. Hartfall has been appointed to the chair of clinical medicine in succession to Dr. Le Fleming Burrow who has retired.

Dr. Hartfall graduated M.B. at the University of Leeds in [illegible], and after holding resident appointments at the Leeds General Infirmary he became medical assistant at Guy's Hospital. In 1931 he took his B.SC. and his M.D. with distinction, and the following year he was awarded a Leverhulme research scholarship for work on anæmia and gastric secretion. In 1937 he took up the chair of therapeutics and applied pharmacology at Leeds where he also held appointments on the staffs of the General Infirmary and Public Dispensary. He holds the Territorial rank of lieut.-colonel in the R.A.M.C. His published work includes papers on the secretion of the stomach and reports on the use of gold in rheumatic diseases as practised in the Leeds Public Dispensary. In 1940 he was elected F.R.C.P.

Dr. Louise Eickhoff has been appointed senior lecturer in child psychiatry.

Institute of Laryngology and Otology

On Friday, Nov. 19, at 4.30 P.M., Mr. Walter Howarth will deliver the annual address at the institute, 330, Gray's Inn Road, London, W.C.1. The title of his lecture is to be The End of an Era—a Retrospect and a Prospect.

Medical Women's Federation

The federation has moved from its war-time quarters in Kent, and its address is now Tavistock House North, Tavistock Square, London, W.C.1 (Tel.: Euston 7765).

Royal College of Physicians of London

Dr. Robert Coope is to give the Mitchell lecture on Thursday, Nov. 18, on Tuberculous Enlargement of Intrathoracic Lymph Nodes and its Aftermath. Dr. J. A. Charles will deliver the Bradshaw lecture on Tuesday, Nov. 23. He is to speak on Victorian Medical Administrators and their Significance for Today. Both lectures will take place at 5 P.M. at the college, Pall Mall East, S.W.1.

Royal College of Surgeons of England

A meeting of fellows and members will be held at the college, Lincoln's Inn Fields, London, W.C.2, on Wednesday, Nov. 10, at 5.30 P.M. On application to the secretary, fellows and members and other diplomates of the college can obtain copies of the report from the council which will be laid before the meeting. Motions to be brought forward must be signed by the mover, or by the mover and other fellows and members, and must be received by the secretary not later than Nov. 1. A copy of the agenda will later be issued to any fellow or member who may apply for one.

On Thursday, Nov. 11, Mr. L. E. C. Norbury will deliver the Bradshaw lecture on Proctology Throughout the Ages. On Wednesday, Nov. 17, Mr. Geoffrey Keynes will give the Thomas Vicary lecture on the Portraiture of William Harvey. On Thursday, Dec. 9, Sir Reginald Watson-Jones will give the Robert Jones lecture on the Reactions of Bone to Metal. All the lectures will be held at the college, Lincoln's Inn Fields, London, W.C.2, at 5 P.M.

Faculty of Anæsthetists.—At a meeting of the board of the faculty held on Oct. 6 Mr. A. D. Marston, the dean, introduced some 19 newly elected fellows who were admitted to the fellowship by Lord Webb-Johnson, the president of the college. It was decided that whereas up to the present only holders of the diploma in anæsthetics of the two Royal Colleges should be eligible for membership of the faculty, in future, holders of the diploma of other recognised bodies should be eligible. The first Joseph Clover memorial lecture, which has been founded by the faculty, will be given by Mr. Marston on March 16, 1949.

The following have been elected to the fellowship:

H. K. Ashworth, Wesley Bourne, S. F. Durrans, H. E. Karslake Eccles, A. H. Galley, Noel Gillespie, Victor Goldman, John Halton, A. E. W. Idris, R. W. Ironside, F. Barnett Mallinson, Mrs. H. Scott Mason, Mrs. K. L. Oldham, Mrs. E. M. Taylor, Ralph M. Waters, Keith Woodruff.

University College, London

Mr. B. C. J. G. Knight, D.SC., will give three public lectures, on Biosynthesis in Micro-organisms, on Thursdays, Nov. 11, 18, and 25. Prof. C. de Duve, who holds the chair of physiological chemistry in the University of Louvain, will lecture on Dec. 6, 9, and 13 on the Control of Carbohydrate Metabolism. All the lectures will be given at 4.45 P.M. in the physiology theatre of the college, Gower Street, W.C.1.

British Association of Physical Medicine

A course in preparation for part I of the diploma in physical medicine will be held at Guy's Hospital beginning on Jan. 10, 1949, if there are enough candidates. Further information may be had from the dean of the medical school, Guy's Hospital, London, S.E.1.

Farouk I University, Alexandria

Mr. G. H. C. Ovens, F.R.C.S., has been appointed professor of clinical surgery in the university. Mr. Ovens has held the posts of clinical assistant and surgical tutor at St. Mary's Hospital, London, and of surgeon in the E.M.S.

Federation of Committees for the Moral Welfare of Children

Today, Friday, Oct. 29, at 2.30 P.M., at the Caxton Hall, S.W.1, the federation is holding a conference on Marriage in Our Time. The speaker is to be Dr. Lilias Jeffries.

Wessex Rahere Club

The first annual dinner of this club was held at the Royal Hotel, Bristol, on Oct. 17. Dr. E. R. Cullinan attended from Barts as guest of honour and some 36 members were present under the chairmanship of Dr. G. D. Kersley. Membership is open to all Barts men resident in Somerset, Wiltshire, and Gloucestershire, and the hon. secretary is Mr. A. Daunt Bateman, 3, The Circus, Bath.

Intermediate Medical Certificates for Inpatients

It has been arranged that, to relieve the pressure on hospital medical staffs, these certificates may be signed by lay officers.

Blackcurrant Syrup

The Ministry of Food has made arrangements, similar to those for last year, to provide blackcurrant syrup and purée for sale through retail chemists for children up to the age of 18, invalids, and persons in need of additional vitamin C.

Royal Statistical Society

At a meeting of the research section to be held on Tuesday, Nov. 2, at 5.15 P.M., at the E.L.M.A. Lighting Service Bureau, 2, Savoy Hill, London, W.C.2, Prof. J. B. S. Haldane, F.R.S., will open a discussion on Statistical Problems Arising in Genetics.

W.H.O. Office in South-east Asia

At a conference in New Delhi early this month, representatives of India, Ceylon, Thailand, Burma, and Afghanistan—the five countries designated to form the South-east Asia regional committee of the World Health Organisation—recommended New Delhi as the site of the regional office.

Contamination of Food by Metals

The Food Standards Committee, appointed by the Minister of Food in January, has set up a subcommittee to inquire into the metallic contamination of foods. The members include: Prof. G. R. Cameron, F.R.S., Prof. S. J. Cowell, Dr. J. M. Johnston, Dr. W. P. Kennedy, and Dr. G. Roche Lynch.

Priority for Children's Teeth

In a statement issued on Oct. 18 the British Dental Association urges the Government to provide dental treatment for children even at the expense of the rest of the population. At present the heavy demands on the general dental service—including the repair and renewal of elderly and middle-aged dentitions—make it impossible to maintain recruitment to what should be the priority service. The association further points out that school dental officers are being offered salaries below the level recommended by the Spens Committee, and adds the warning: "Unless the Ministry of Health and the Ministry of Education take a responsible and constructive interest without delay, there is the gravest danger of the existing skeleton priority dental service for our children crumbling away into dust."

The Dental Service Association further add that the shortage can only be met by using all the dental resources of the country, and suggest that "if the Denture Repair Services were brought into the scheme, much of the work which is now unnecessarily engaging the energy of dentists could be taken off their hands."

Births, Marriages, and Deaths

BIRTHS

Barras.—On Oct 1, in Malta, the wife of Dr. B. W. Barras—a son.

Bulstrode.—On Oct. 19, at Hartfield, Sussex, the wife of Dr. J. C. Bulstrode—a daughter.

Elek.—On Oct. 1, the wife of Dr. Stephen Elek—a daughter.

Garvie.—On Oct. 13, at Woking, the wife of Dr. J. M. Garvie—a son.

Lambley.—On Oct. 15, at Northampton, the wife of Mr. D. G. Lambley, F.R.C.S.—a son.

Lewin.—On Oct. 15, at Oxford, the wife of Mr. Walpole Lewin, F.R.C.S.—a daughter.

Parry.—On Oct. 21, at Cardiff, the wife of Mr. J. N. M. Parry, F.R.C.S.—a daughter.

Seward.—On Oct. 21, in London, the wife of Dr. E. C. Seward—a daughter.

Sugars.—On Sept. 29, the wife of Dr. J. C. Sugars—a daughter.

Wright.—On Oct. 18, in London, the wife of Dr. E. G. Wright—a son.

MARRIAGES

Childs—Forbes.—On Oct. 16, at Frimley, John Michael Childs, M.B., to Elizabeth Sheila Forbes.

Knowlson—Wilson.—On Oct. 5, at Oxwich, Gower, George Akenhead Knowlson, M.A., to Lydia Annie Wilson, M.D.

DEATHS

Govan.—On Oct. 17, at Cockermouth, Cumberland, George Govan, M.B. Edin., aged 84.

Innes.—On Oct. 16, Edward John Innes, M.B. Lond., Flight-lieutenant, R.A.F., aged 26.

Diary of the Week

OCT. 31 TO NOV. 6

Monday, 1st

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. F. Wood Jones, F.R.S.: Muscles of the Bo Wall.
5 P.M. Dr. Cuthbert Dukes: Surgical Pathology of Intestin Tumours.

SOCIETY OF APOTHECARIES, Black Friars Lane, E.C.4
5 P.M. Dr. Eliot Slater: Constitutional Factors in Psycholog Medicine.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Roa W.C.2
2.30 P.M. Miss D. J. Collier: Facial Paralysis from t Otological Standpoint.

Tuesday, 2nd

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. Geoffrey Marshall: Tuberculosis of the Bronchi.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. D. V. Davies: Middle Cranial Fossæ.
5 P.M. Dr. Dukes: Surgical Pathology of Intestinal Tumours.

SOCIETY OF APOTHECARIES
5 P.M. Dr. Peter Bishop: Use of Sex Hormones in Therapeuti

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: *Histopathology of the Skin.*

CHADWICK LECTURE
2.30 P.M. (Westminster Hospital medical school, Horsefe Road, S.W.1.) Dr. W. E. B. Lloyd: Prevention Tuberculosis with Special Reference to Environment.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. J. W. McNee: Cirrhosis of t Liver.

Wednesday, 3rd

ROYAL COLLEGE OF SURGEONS
5 P.M. Prof. Ronald Hare: Staphylococci.

LONDON COUNTY MEDICAL SOCIETY
3 P.M. (Lambeth Hospital, Brook Drive, S.E.11.) Clini meeting.

UNIVERSITY OF LIVERPOOL
5 P.M. (Arts Theatre.) Prof. Edward Churchill (Harvar Wounds of the Chest—a Study of the Evolution of Meth in Surgery.

Thursday, 4th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Sir John Parkinson: Aortic Stenosis.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: Nerve-supply of the Limbs.
5 P.M. Professor Hare: Staphylococci.

UNIVERSITY OF LONDON
5 P.M. (1, Wimpole Street, W.1.) Mr. G. Ewart Marti Broncho-œsophagology in Great Britain. (Semon lectu

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. G. B. Mitchell-Heggs: Complications in Eczema.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
2.30 P.M. Mr. J. Angell James: Diseases of the Antrum Dental Origin.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY
3 P.M. (London Jewish Hospital, Stepney Green, E.1.) Mr. H. Levy: Æsthetics of Vision. (Presidential address.)

HONYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh Royal Infirmary.) Mr. Robert Malle Carcinoma of Rectum.

Friday, 5th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. G. Oakley: Complications of Diabetes and the Treatment.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Harris: Clinical Anatomy of the Abdome
5 P.M. Dr. R. J. Ludford: Cytopathology of Cancer.

SOCIETY OF APOTHECARIES
5 P.M. Prof. E. D. Dodds, F.R.S.: Endocrinology and its Relatio to Diagnosis and Treatment.

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Mr. V. C. Thompson: *Surgery of the Œsophagus.*

On Oct. 5, at the Rikshospital in Oslo, *Prof. F. G. Young* of University College, London, delivered the third Jacobæu lecture, founded in memory of Prof. H. C. Jacobæus, o Sweden, who died in 1937. He spoke on the *Relation of th* Pituitary Gland to Diabetes Mellitus.

Mr. A. G. Timbrell Fisher has been elected to the fellowshi of the American College of Surgeons.

CORRIGENDUM: *Œstrogens in Diabetes.*—Ref. 3 on p. 65 should read Biskind, M. S., Schreier, H. *Exp. Med. Surg.* 1945, 3, 299.

THE VOCATION OF MEDICINE *

LORD HORDER
G.C.V.O., M.D. Lond., F.R.C.P.
NSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL, LONDON

You are, I suppose, at various stages of your medical ing. Some of you are in the preclinical stage. Some in the wards and post-mortem room. Some are in special departments. And some of you have, no t—I won't say finished your training, because in icine, as in life, one never finishes one's training—a of you are what the law euphemistically calls ualified."

What I say today applies chiefly to those who are the beginning of their training and will later be aged in doctoring, whether as general practitioners—ing, as I must in the public interest, that this ticular genus continues to exist—or as consultants d specialists. A few, no doubt, will drop out by the yside, changing over to industry, politics, or even one of the other "liberal" professions, finding that oring is not, after all, and speaking in the vernacular, r "cup of tea."

Many years ago, Sir James Paget analysed 1000 dical students from the point of view of what happened them. It was an interesting but rather a disappointing dy.

For two reasons Paget's analysis is not applicable ay. In the first place it is possible to break away m the straight line of doctoring at a number of points the course of training, a fact which should be borne in d when any one of you begins to doubt if you are iciently interested in your human fellow creatures to ke a good doctor. You can teach in the preclinical cts; you can take up X-ray or radium work; can be a clinical or an academic pathologist; you engage in public health.

the second place there is more thought being given an formerly as to whether you should "go in" edicine at all. The whole outlook has received a jostle. If a boy or a girl is individualist in erament, and is keen upon a spice of adventure, he e may today well hesitate. Sons and daughters octors, making, as they generally do, good doctors selves, will pause and think, as indeed their parents will. This position may, of course, adjust itself; n optimist (or is this wishful thinking in the public est?) I believe that it will. Anyway, when I am ked if there is a future for doctors I still answer Yes. ll that a man hath will he give for his skin." The chinery of doctoring isn't working very smoothly the moment, but the individual doctor cannot be ensed with, and it is for the individual doctor, with public backing, to see to it that mere machinery not handicap his best work, or, should I say, these , does not find him "frustrated."

But there is another question that I am frequently d. That is, whether a boy or a girl will *make* a good tor.

Now although I hold strongly that a good doctor, like d poet, is born and not made, I do not mean by what those parents mean who see a budding doctor their child as they watch him pulling a fly to pieces, or at the child himself means when, later on, he says, the emerging ego of youth, "I always wanted to be doctor." It is true that I have no statistical evidence to the efficiency of these two groups in actual practice, I gravely mistrust the incident, and the sentiment, indicating fitness for doctoring. I don't regard the essentials for an efficient doctor as either exceptional or dramatic. Good health is a primary requisite, and I am glad to note that here in Sheffield some assurance as to this is obtained before a student is admitted. A good general education is also essential. Some *nous*, as it is called, is very helpful and a humanist approach to other folk. Indeed, I don't find it difficult, after an interview, to answer the question with a Yes or No in the majority of cases.

But all this is too late on this occasion. You are committed—though, as I said, by no means irrevocably committed to that branch of Medicine which I regard as its most valuable branch, the form which entails a "close up" between doctor and patient.

A wise man once gave a definition of what he called successful Medicine in the words "Successful Medicine is sympathy armed with understanding." I entirely agree, and I think the definition would lose none of its truth if it ran "successful Medicine is understanding touched with sympathy." I shall assume in the beginners amongst you a modicum of cleverness and goodness—to use very homely words—that will make the journey you have embarked upon a successful one. With this basis let me tell you some things that seem to me to be useful as you proceed. And you must forgive the use of the imperative tense in which I shall speak. The privilege of being exhortative is one of the few compensations allowed to those who have arrived at that stage in their professional life when they are invited to give addresses like this.

Understanding

READING

My first effort to help you will probably be hailed with acclamation. It is to warn you against studiousness. (Yes, but you must hear me through!) It was Francis Bacon, I believe, who first uttered what is only apparently a paradox, that "to spend too much time in studies is sloth." I am quite sure, from my own personal experience, that excessive reading may be a form of laziness and I shall presently tell you why. If you spend most of your time in reading you are likely to be left, not only with no time for the more important occupations of observing and thinking, but with no mind wherewith to do these essential things.

"Knowledge is valuable according as it helps us in action"—a maxim which I commend to those who are responsible for your curriculum. Froude might well have had our science and art in his mind when he said "the knowledge which a man can use is the only real knowledge that has life and growth in it. The rest hangs like dust about the brain, or dries like raindrops on the stones." Broussais applied this to Medicine: "facts which cannot be used for healing," he said, "do not belong to the physician, they belong to the naturalist."

OBSERVATION

Then as to how you should spend most of your time: the first essential is that you must cultivate the power of observation, without which—nothing. If you say this advice is a "hardy annual" on occasions like this, I should retort that hardy annuals are the only annuals worth growing. If you ask me, observe what? My reply is, observe anything, everything, and begin to do it at once. From the moment you made the decision to be a doctor everything should have become "clinical." But observe especially men and women and children and the things connected with them, for these are to be the future life of most of you. Observe the colour of their eyes, the shape of their head, the length of their hair, the clothes they wear, the way they walk and hold themselves, how they shake hands, how they say good-morning—and a hundred other things. Do this whilst you are engaged in your preclinical studies. Train your attention to be active rather than passive, and so break up *that useless reverie in which the untrained mind* spends the greater part of its life, yes, even when it is studiously reading: "Sometimes I reads and thinks and sometimes I just reads." This reverie *can*, with discipline, be changed for an alertness, an awareness, that supplies the mind with food on which it may *ruminate*. Someone in authority has said that we only use one-third of our brain for the ordinary affairs of life. I do not know how he *arrived at this conclusion*, but speaking for myself I should regard this estimate as being too liberal.

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* Address in opening the winter session of the medical school at Sheffield on Oct. 13. In his opening passages Lord Horder paid tribute to some of his distinguished predecessors who have addressed the school.

By the *time* you enter the wards and the outpatient rooms this habit of active attention, which is by this time becoming more and more effortless, will enable you to observe many things about your patients that do not need instruments and yet are as valuable, often more valuable, than those that do require them.

At first, and probably for some time, you will observe a lot of things that are quite useless, things that are quite dissociated. How can it be otherwise? But later it will be found that your observations tend to become systematised, purposeful, and synthetically useful. In time you will develop the power of observing things that are not obvious, you will look not only *at* things but *for* things—associated things, that together make sense, that make, in the fullest meaning of the word, a diagnosis.

In this exhortation to train yourselves to observe I am not thinking of your eyes only. Your ears, also, are important, and not only in the field of auscultation. The character of a cough, the rhythm of breathing, the lack of overtones in a voice, even on the telephone, these are observations that are full of meaning to the initiated. Then I might expand all this by reference to touch and smell. These large, but vitally important observations are all the more important nowadays when instruments of precision have become so numerous and so popular. Instruments of precision enable us to measure the degree of the defects which our trained senses tell us are present. It is this clinical acumen which should suggest to us in what directions we may most profitably employ these instruments. But you cannot achieve this facility unless you have made observation a familiar habit. Then, when you have done this, that common expression, "I became aware of," does not wait until sights and sounds are shattering your senses and hammering at the door of your consciousness; you are aware almost *un*consciously. You have developed mental antennæ.

When this faculty has arrived you will find that two other things happen. You make many observations without knowing it and your observations take on a selective character: they group themselves in terms of affinity *and you develop the faculty of distinguishing* the essentials from the non-essentials.

I believe that those people who possess what is called a "clinical sense" really owe it to *these two facts*; they make many observations of which they are unconscious, and they effect a synthesis of those observations that are causatively associated. At the same time they are able to discard those that do not possess these characters.

Herein lies the nearest explanation I can give of the mental processes involved in diagnosis. And diagnosis is, of course, the end to which all observations should tend. Diagnosis, like ripeness, is all.

But side by side with the development of this facility in observation there goes necessarily the basic facts of anatomy, of physiology and of chemistry. These form the touchstone by which we are able to recognise the morbid from the healthy. Facility in observation, combined with experience of the healthy, enables us to pick out the unusual from the usual, to note deviations

from the average. I use the word "aver
than the word "normal" because normality
which involves us in a number of more o
theoretical *considerations; the average is*
of actual experience.

RECOGNISING THE AVERAGE

My third exhortation, therefore, is to tra
to recognise the average, so that your attent
struck by any deviation from it. The devia
physiological or it may be pathological;
assumed to be pathological *unless there*
reasons to the contrary. If pathological
trivial and therefore negligible, or it may b
and therefore informative. *It should be*
be important until proved otherwise.

Let me illustrate. The height of the gr
of persons of the same age and sex varies
inches, and their weight varies within a
So that we quickly *notice that this man is*
one short, this *woman* fat and that one th
readily, however, do we notice deviation
average complexion, *nor from the average ga*
of sitting on a chair, nor of lying in bed, no
hands, nor of reaction to conversation, thoug
average, too, in all these things. *As inde*
an average in the more elaborate forms of
how else do we recognise, when we see them, t
the spinster, and the *only child*?

The value of *recognising even slight deviati*
average in these and other matters is seen
stages of a number of diseases which, but for t
might otherwise go unsuspected. To those
already have some clinical experience I need o
hypo- and hyper-thyroidism, chorea, neph
disease, general paresis, and parkinsonism.

And there is more "to it" (*if you will*
vulgarism) than this. You must observe pe
for other things than complexion—for the e
pain, physical and mental, for happiness and u
and especially for anxiety and fear. What,
the dominant emotional state, and whet
only of recent origin or has been in exist
long time.

The value of this kind of observation is i
It enables us to "check up" the things th
tell us: that agonising pain, those sleepl
those days and weeks of so little food that it
life is not extinct. Look at their faces—an
put them on the scales, and on the couch—
their faces.

After a time, if you have become sensitive to
from the average, it will sometimes be bor
you that the person with whom you *are in*
not average, but for the moment you cannot s
way. You must not pass that doubt off lightly
accept the challenge, you must revise your o
and seek to explain it, for it may prove to b
the main position.

By this kind of mental discipline you wi
a power that unthinking folks call "*unca*
isn't really uncanny; it merely means that
trained your mind but that the onlooker does
working. The prestidigitator's legerdemain
"uncanny" after years of training of his han

You have now become expert, which mean
possess a power which the layman has not go
were not the case the layman's ideas of health
as sound as the doctor's; and they aren't. Th
"looks the picture of health" may not be heal
he may be a case of *polycythæmia. And*
possessor of that "broad chest," which he d
such military fashion, may be showing us o
committal signs of emphysema.

If I have made myself clear and my premises are sound, I think you will see that mere industry, whether with books or with instruments, useful though both of these are in the acquirement of knowledge, can never supply us with the fundamental wisdom that Medicine, of all human pursuits, really demands.

So much for understanding. And now a few words about the second essential in a good doctor—*sympathy*.

Sympathy

Industry can never be a substitute for sensitivity. When you begin the study of Medicine many of you possess the power of fine appreciation and delicate discrimination. Don't try to "douse" it. Don't be ashamed of it. It is of tremendous service if transmuted through the personality of a good doctor. But it will be of even greater service if you cultivate it and discipline it, when you are face to face with your patients. How many people have need of your *spiritual* sensitivity you will not realise until you make close contact with them as doctor and patient. And many of your patients (and among these will be some of the nicest) will cover their need with a spurious brusqueness which you must not fail to put aside, gently, of course, because they are just as much ashamed of their need as some of you may be of your power to supply it.

Begin to cultivate this gift of sympathy early. Sit down on the lockers of the patients who are allotted to you and talk to them. The experience will surprise you—and it will probably surprise the patient! A good deal has been said about the doctor-patient relationship; I've said a good deal about it myself. But since it is the very soul of good doctoring its importance can never be exaggerated. One of my chief reasons for distrusting the "new look" recently given to British Medicine is its tendency to disregard the "close-up" which is so important between doctor and patient. Availability of Medicine to all the people is a good idea. I am "all for it," as the expression goes. But *what* Medicine? Seeing 85 patients in a doctor's "surgery hour"—the operative word is clearly "seeing"—not Medicine. This is one of the results of the switch-over that it is to be hoped will soon be adjusted. There are other knots to unravel. But the standard of doctoring is the thing that matters and no one can maintain it except the doctor himself.

It is easy to level down; it can be done with a stroke of the pen; it is difficult to level up, and that takes time. If it be found that the machine will not enable good work to be turned out, then the machine must be reconstructed.

Meantime, the "new look" hasn't changed my view of fundamental Medicine. I still think it is a good thing that you are committing yourselves to. You will find that Medicine presents life to you in its full range. If you are a realist like old Montaigne, you will be able to "find a ravishing kind of satisfaction in pleasing another, and in doing a just action." And if you are an idealist, then, at the risk of being thought sententious, I would like to read you part of a lecture by a great physician, Peter Mere Latham, because it traces in far better language than I can do, the history of the soul of the good doctor.

"Diseases are not abstractions; they are modes of acting, different from the natural and healthy modes—modes of disorganising, modes of suffering, and modes of dying; and there must be a living, moving, sentient body for all this. This body must be your study and your continued care. Nothing must make you shrink from it. In its weakness and infirmities, you must still value it—still stay by it—to mark its hunger and thirst, in sleeping and waking, its heat and its cold; to hear its complaints, to register its groans. And is it possible to feel an interest in all this? Indeed it is. Whence comes this interest? At first it seldom comes naturally; a mere sense of duty must engender it. Presently, the quick, curious, restless spirit of science enlivens it; and then the deliberate choice of the mind.

"When the interest of attending the sick has reached this point, there arises from it a ready discernment of disease, and a skill in the use of remedies. And the skill exalts the interest, and the interest improves the skill, until, in process of time, experience forms the consummate practitioner. But does the interest of attending the sick necessarily stop here? No. What if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure is exalted into a principle, and invested with a moral motive, and passes into the heart. . . ."

Whether you push straight through and become a general practitioner, or whether you specialise, or whether you branch off at any of the points in the curriculum where the science, rather than the art, attracts you, you will not repent your main decision. I believe that you can lose your soul with less ease along this path than any other I know. You will frequently be rewarded by people's gratitude and affection on account of services you scarcely thought about when you rendered them, and some of your labours that you reckoned hardest and most worthy of applause will go unrecognised. But you have your stalwarts to stimulate you, should you lack courage, and you have their examples to light you on your way. Are you doubtful of success? "I have a key in my bosom called Promise (said Christian) that will, I am persuaded, open any lock in Doubting Castle. Then, said Hopeful, that's good luck, good brother; pluck it out of thy bosom and try."

THROMBO-ANGIITIS OBLITERANS

RESULTS OF SYMPATHECTOMY AND PROGNOSIS

J. B. Kinmonth
M.S. Lond., F.R.C.S.
CHIEF ASSISTANT, SURGICAL PROFESSORIAL UNIT,
ST. BARTHOLOMEW'S HOSPITAL, LONDON

In a recent review of cases of thrombo-angiitis obliterans treated in fourteen years it was possible to trace 77 patients in whom the diagnosis was confirmed and of whom records were complete; 8 patients could not be traced. Attention was particularly directed to the natural course of the malady over a period of years, and the effects of sympathectomy in different clinical types of the disease.

A generally acceptable definition of thrombo-angiitis obliterans, or Buerger's disease, is an obliterating disease of the arteries and veins, usually affecting segments of vessels in the extremities, and occurring almost always in young men. The cause of the vascular lesion remains unknown.

DIAGNOSIS

The main features of the disease are usually clear enough to permit of diagnosis by simple methods. The history is characteristic, and clinical examination gives clear evidence of ischæmia, particularly the loss of the arterial pulses in the limbs. Special investigations are occasionally needed to make or to confirm the diagnosis, but they are not essential in the average case. Oscillometry is a useful refinement in the detection of arterial pulsation, particularly in œdematous limbs where swelling makes it difficult to feel the pulse. Arteriography is sometimes of great help in uncertain cases but is unnecessary and unjustifiable as a routine measure. Microscopy of vessels obtained from amputated digits or limbs or by arterectomy is often valuable in diagnosis. It is important to cut sections over a sufficient length of the affected vessel, because unrepresentative portions containing consecutive thrombus, and presenting a picture of clot in the lumen of an apparently normal vessel, will cause confusion if this precaution is not taken.

Thrombosis of superficial veins occurred in 24 of the 77 cases, and in 19 patients it was the first symptom of the disease. Superficial phlebitis, or a history of it, is important in diagnosis, but microscopy of an affected vein is not usually of great value, unless the nature of the swelling is in doubt, as when short lengths of small veins are involved. These may present as tender cutaneous nodules, the nature of which is discovered by biopsy and microscopy, as in the following case.

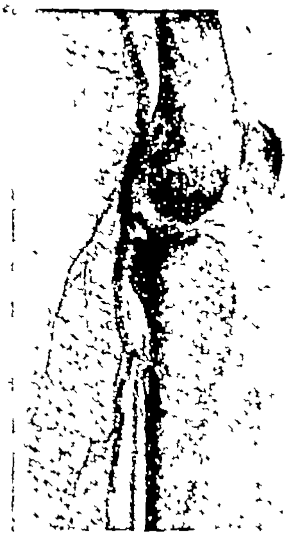


Fig. 1—Normal arteriogram of leg, showing arterial branches to calf muscles.

A man, aged 22, sustained an injury to his left knee in a car accident. Six years later the foot became cold, and he had pain in the calf after walking a few miles. The walking distance gradually diminished to 300 yards, when he sought medical aid. He was found to have a left popliteal thrombosis and no evidence of disease elsewhere. This was thought to be entirely post-traumatic, though the long interval before developing claudication was difficult to explain. Small tender cutaneous nodules next appeared spontaneously on the left leg. One of these, when removed and examined histologically, proved to be a focus of thrombophlebitis with changes usually considered typical of thrombo-angiitis obliterans.

ÆTIOLOGICAL FACTORS

An attempt was made to assess statistically the connexion between smoking and Buerger's disease. It proved impossible because the patients could not be separated into clear categories of those who stopped smoking and those who continued; too many merely reduced their smoking or continued to smoke sporadically. The one non-smoker in the series was also the only female patient. Two patients gave up smoking entirely but had fresh attacks of Buerger's disease in different parts of the body in subsequent years. Though smoking is not regarded as the cause of the disease, patients were advised to give it up because of its known vasoconstrictive effect on peripheral vessels.

This series, unlike some others, did not include an unduly high proportion of Jews.

Only 1 of the 77 patients had a positive Wassermann reaction. Syphilitic infection, when present, appears not to be of ætiological significance.

NATURAL COURSE

The average age of the patients at the onset of the disease was 35 years. The oldest patient was 48 and the youngest 16 when the disease started. The first episode in the history of this youngest patient was an isolated phlebitis several years before any arterial symptoms arose, but there were several patients whose initial manifestation was an arterial one, such as claudication starting at the age of 20 or 21.

Episodes of Activity.—It is well recognised that Buerger's disease tends to run its course in a series of episodes of activity, separated often by months or years of quiescence. Therefore all the histories were carefully analysed so that the periods between active episodes were known for every patient. The longest of these periods was fourteen years. Many other patients experienced fresh attacks of activity after an interval of ten years.

It has been suggested that Buerger's disease can burn itself out completely; but, since we know that it can manifest itself afresh after many years, it seems doubtful whether it can ever be said to be completely cured.

Duration.—There were 7 fatal cases, in whic duration of the disease and the causes of death we to be as follows:

Duration of disease at death (yr.)		*Cause of death*
5	..	Coronary thrombosis
11	..	Widespread gangrene
31	..	Widespread gangrene, including thrombosis
13	..	Mesenteric thrombosis
4	..	Buerger's disease (no more information)
2	..	Cerebral hæmorrhage
2	..	Coronary thrombosis, embolism, g
Average 9·9		

It will be seen that all the deaths were due to m tations of the disease, and that the duration disease varied widely, the longest history from o death being 31 years. One patient still alive ha 30 years since his first symptom.

CLINICAL TYPES

The cases fell naturally into three groups acc to the initial site of the disease, for it sometimes s in large vessels, sometimes in the small vessel sometimes in both simultaneously. The main cri of differentiation was the presence or absence popliteal pulse. Prognosis varied in the three gro regards alleviation of symptoms by sympathectom survival of the limb.

Obstruction of a Main Vessel.—In this group thro occurs in the femoral or in the popliteal arter popliteal pulse is not palpable, and the main sym is intermittent claudication in the calf. As a rule are pronounced postural colour changes, and w of the calf muscles is often evident. Provide thrombosis does not extend downwards into the s distal vessels, the collateral circulation is usually ade to prevent gan of the foot, the of which rem comparativ healthy.

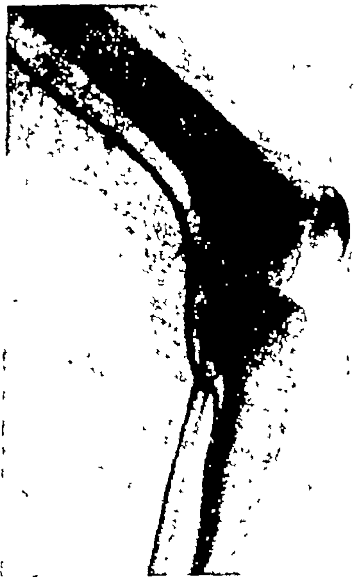


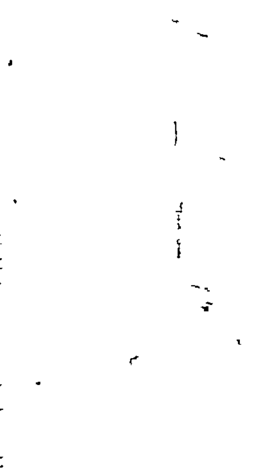
Fig. 2—Arteriogram showing Buerger's disease affecting smaller arteries to calf muscles in a patient with a palpable popliteal pulse and claudication pain in the calf.

Obstruction of Vessels.—When smaller vessels a first to be atta the popliteal remains palpabl the pulses at ankle are dimi or absent. As would expect, s toms appear in foot—claudicatio the sole, rest constant erythr nosis of the skin, *coldness followe* ulceration or grene of *the* Some of the pat in this group claudication in calf, which, in presence of a popl pulse, must be a buted *to* obstruc of the muscular branches of the main vessels.

Mixed Type.—The clinical picture in this group combination of the other two, since the disease att the main and the smaller arteries simultaneously, so claudication in the calf, loss of the popliteal p t pain in the foot, with the premonitory signs of ne, all come on together.

EFFECTS OF SYMPATHECTOMY

Claudication pain in the calf is one of the prominent ptoms from which these patients may suffer. Reports of results of sympathectomy are infrequent in the otherwise extensive literature of Buerger's disease, and the statements made about its effect on claudication are often vague and unsatisfactory. Telford and Stopford[1] stated that the disability had been entirely abolished in some of the milder cases, but that the average result was persistence of claudication, often with a considerably lengthened walking distance.



—Arteriogram showing Buer- disease affecting smaller es in the foot in a patient a palpable popliteal pulse but distal pulse, and with rest pain the foot, claudication pain in the and ulcerated toes.

Others have tried to assess improvement on a percentage basis, but this may give a very misleading impression of results—in the case, for example, of a nt who could walk 15 yards before operation and yards afterwards, who would be rated as "100% rovement." In the present series a patient was not d as "improved" unless his walking distance was ed by a really useful amount after operation, a of a mile being taken as a minimum. Patients ely questioned or tested on their postoperative distance, and this was compared with the ative distance noted in the records. This often that the patients entertained a somewhat tio idea of the amount of improvement, and that and critical assessment was necessary.

dication.—The effect of sympathectomy on claudi- pain in the calf was as follows:

of disease	*No. of limbs affected*	*No. improved*
n vessels	23	9
all vessels	19	16
xed	14	0
Totals	56	25

e figures indicate that the best results are to be cted when the smaller vessels are affected—i.e., n the popliteal pulse is palpable. Improvement was observed in the mixed type.

rival of the Limb.—The fate of the limb in the three of disease for all cases in the series in which a athectomy was performed was as follows:

of disease	*Sympathectomised lower limbs* Total	*Lost*	*Preserved*
Large vessel	23	10	13
all vessels	72	17	55
xed	16	10	6
Totals	111	37	74

It will be seen that the prognosis is best when the all vessels alone are affected. Limbs classed as erved are those in which, though a minor amputation, h as that of a toe, may have been necessary, a major putation was not required.

The fate of the limb in the three types for all cases in the series, including those which were not submitted to sympathectomy, was as follows:

Type of disease	*All lower limbs* Total	*Lost*	*Preserved*
Large vessel	26	12	14
Small vessels	81	18	63
Mixed	16	10	6
Totals	123	40	83

The limbs not submitted to sympathectomy were too few to be compared with those operated on, and they also included the mildest cases. The figures for the whole series emphasise still further the better prognosis when the small vessels alone are affected.

It is clear that in the cases of obstruction of a main vessel the onset of gangrene indicates the spread of the disease to the smaller vessels—i.e., the cases have become of mixed type in spite of sympathectomy. It is impossible to say exactly what effect sympathectomy has had in stopping or slowing this process of spread, since no control series of similar untreated cases is available.

In the limbs preserved the average duration of arterial symptoms at the follow-up examination was seven years in disease of the small vessels and four years in disease of a large vessel. Only 1 limb is known to have survived with the mixed type of disease for more than two years.

Other Effects of Sympathectomy.—Besides claudication pain in the calf, other symptoms less amenable to statistical demonstration were benefited, including claudication in the sole, rest pain, and the superimposed vasospastic attacks in the extremities characterised by coldness and numbness, often resembling Raynaud's disease. It seemed also that ulcers and minor amputations healed better after sympathectomy.

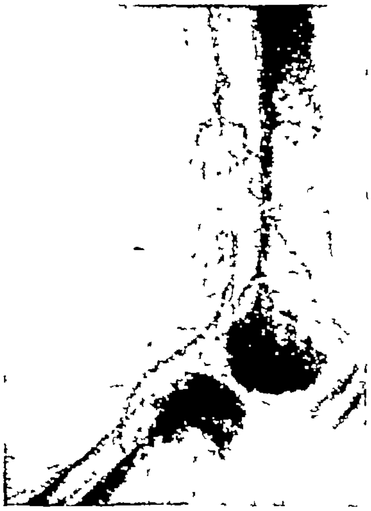


Fig. 4—Arteriogram showing Buerger's disease affecting larger arteries in a patient with impalpable popliteal pulse, claudication pain in the calf, and a relatively healthy foot.

"*Prophylactic*" *Sympathectomy.*—In some early cases of unilateral Buerger's disease bilateral sympathectomy was performed. In several of these the disease subsequently appeared in what had been the sound limb. Hence "prophylactic" sympathectomy did not give complete protection, though it possibly delayed the onset of symptoms.

SUMMARY

Buerger's disease is episodic and may recur after many years of quiescence. Without a very long follow-up, therefore, it is impossible to be certain that any particular form of treatment has cured the disease.

Cases may be divided into three groups according to the initial site of the disease in the arterial tree. The effects of sympathectomy and the prognosis for the limb are best when the smaller vessels are the first to be attacked

I wish to thank Prof. J. Paterson Ross for his great help and advice in the preparation of this paper.

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[1] Telford, E. D., Stopford, J. S. B. *Brit. med. J.* 1935, i, 86.

OVULATION AND THE MENSTRUAL CYCLE

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THERE is much divergence of opinion concerning both the time of ovulation in the menstrual cycle and the subdivision of that cycle into phases with characteristic endometrial histology. A considerable body of opinion holds that, whereas the commonest time of ovulation is about midway in the cycle (of 28 days), there is a wide range of variation in different individuals, and that even in the same individual the day of ovulation may vary in different cycles (Asdell 1927, Evans and Swezy 1931, Weinstock 1934, Burr and Musselman 1938, Stein and Cohen 1938, Seymour 1939, Altmann et al. 1941). Some investigators claim that ovulation is more closely related to the succeeding than to the preceding menstrual period (Knaus 1934, Ogino 1934, Pryde 1941, Smith 1942).

TUBAL OVA

Several workers have used tubal ova or young intra-uterine embryos to estimate the time of ovulation, and Hamilton et al. (1943) claim that the recovery of tubal ova at a definite period of the menstrual cycle gives the most reliable information concerning the time of ovulation.

The five ova found by Allen et al. (1930) indicated that ovulation took place between the 12th (or 11th) and 14th days of the cycle, although the duration of the cycles is not stated. The ovum recovered by Lewis (1931) indicated that ovulation took place 15 days before the expected onset of the next menses, assuming that the present cycle was one of 35 days, as was the preceding one, although the previous cycles were of 28 days' duration. Of two ova found by Pincus and Saunders (1937) one suggested that ovulation was 12 days before the postulated beginning of the next cycle (28-day cycles), and the other that it took place 9–13 days before the next menstruation (depending on whether the present cycle was of 26 or 30 days' duration). Miller et al. (1938) and Reimann and Miller (1939) concluded that the five ova recovered by them indicated that ovulation took place between the 15th and 17th days before the anticipated onset of the next menses (28-day cycles). Hamilton et al. (1943) discovered two ova, one of which indicated that ovulation took place 14 days before the presumed onset of the next cycle (last cycle 30 days, previously 28 days), and one that it took place 14–15 days before (28-day cycles).

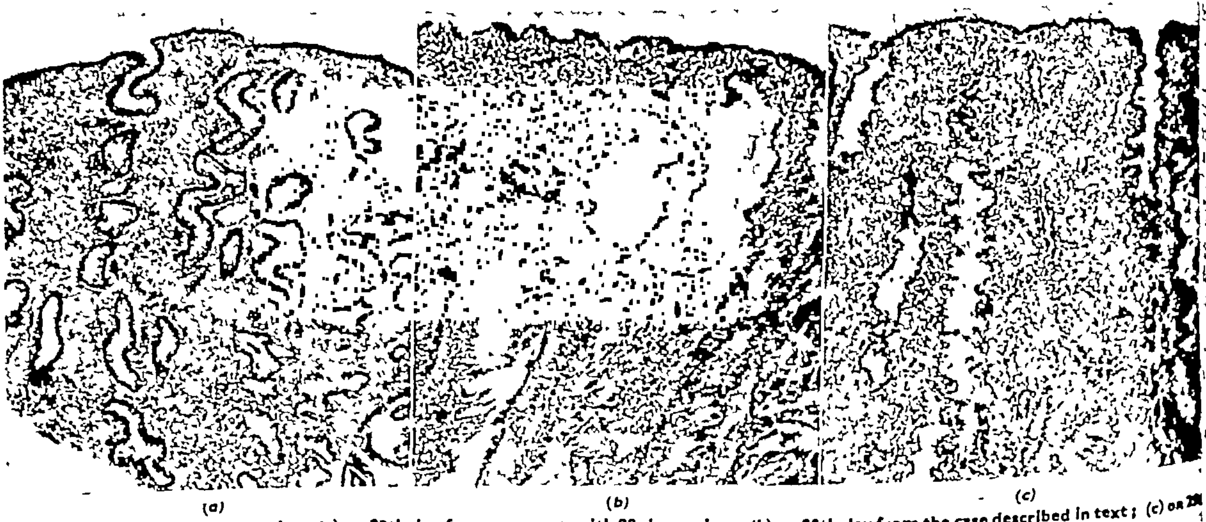
In the cases cited above the writers tacitly assume, for calculating the relation of ovulation to the onset of the next menses, that the present cycle, had it not been interrupted (generally by hysterectomy), would ha been of the same length as the immediately precedi one. There is no conclusive evidence that such assumption is warranted. Rock and Hertig (1944), fr a study of three unfertilised tubal ova and eleven you intra-uterine embryos, estimated that the interval betw ovulation and the next expected menses in these ca ranged from $11^1/_2$ to 17 days. In the case of the fertili specimens these figures were obtained by adding estimated age of each embryo to the estimated inter between operation and the next catamenia, as jud from the condition of the endometrium, although th admit that this last estimation is uncertain. When th computed the lengths of the estimated postovulat phase in terms of percentages of the estimated leng of the menstrual cycles, they found that the *average* these percentages did not deviate from that calculat by using the theoretical figure of 14 days for ovulat time, sufficiently to interfere with the indication t ovulation took place about 14 days before the onset the next expected period. But these results relate to average for the series of cases and mean neither more less than that ovulation most often took place ab 14 days before the next period but may take pl outside this limit, as is indeed revealed by the fig in their individual cases.

ENDOMETRIAL CHANGES

With regard to the changes in the structure of endometrium during the menstrual cycle, there notable differences in the results of those who h suggested the division of the cycle into various pha each of definite duration and with its particular en metrial structure (Schröder 1915, Fraenkel 1924, Sh 1925, 1941, Markee 1940, Novak 1941, Krafka 1942)

In view of existing uncertainties, some details relat to a very early human embryo described by Davies Harding (1944) are here reported, since they prov evidence that ovulation can take place early in menstrual cycle, and that the histological structure the endometrium on a particular day of the cycle influenced by the remoteness of that day from the ti of ovulation.

The embryo is in a previllous stage of development it was obtained by hysterectomy from a married wom aged 26, who had no previous abnormal gynæcologi or obstetrical history, and the embryo and the en metrium present no abnormal features. From its his logical characters, and by comparison with other p villous embryos both of man and of the macaque monk


(a) (b) (c)

Photomicrographs of endometrium (*a*) on 20th day from a woman with 28-day cycles; (*b*) on 20th day from the case described in text; (*c*) on [illegible] day from a woman with 28-day cycles. (× 50.)

was estimated to be 9–10 days old. The menstrual coital histories, obtained at the time from both and husband, were clear and definite. The woman ed that her periods came on regularly every 4 weeks ("every fourth Sunday"); this reply was accepted full knowledge that variations in the length of the in the same individual are very common. Menstrual ing took place during the first 4 days of the present ; the first coitus took place on the 10th day; took place also on each of the 11th to 15th days; uterus was removed on the 20th day. The maximum of the embryo calculated from the coital history onises with the age estimated from the histological ination, and the coitus on the 10th day was con- ed to have been the one responsible for fertilisation; this it was deduced that ovulation took place on 9th or 10th day. The relation between the coitus and ation suggests the possibility that ovulation was ced by this first act of copulation in the cycle (on 10th day). Postulation that ovulation took place in the cycle would have led to the unwarranted sion that the embryo was younger than is indicated the stage of development attained by the several yonic elements.

If ovulation took place on the 9th or 10th day, the tant corpus luteum would, by its progesterone and rogen secretion, begin to induce the secretory phase the endometrium 4 or 5 days earlier than would have the case if ovulation had occurred on the 14th day. is noteworthy that the histological structure of the metrium on the 20th day of the cycle in the present is closely similar to that of the endometrium on 24th or 25th day in several specimens examined from women with 28-day cycles, and it is certainly much advanced in the secretory phase than several specimens from women with 28-day cycles. In other cases ovulation probably took place nearer middle of the cycle. The endometrium in specimen figure) closely resembles that in *c*, and is more d in the secretory phase than that in *a*.

and Hertig (1944) estimate the interval which would expect to elapse before the onset of the next by the stage reached by the endometrium in specimens. But they admit that this estimated time ertain. In the present case the interrupted cycle l in this manner be estimated (in the absence of ancy) to terminate in 4 days—that is, the present would be deduced to be one of 24 days (in contrast the previous regular 28-day cycles), on the ground the endometrium on the 20th day has reached a comparable with that on the 24th or 25th day in imens from other women with 28-day cycles who ably ovulated near the middle of the cycle. But such duction is questionable, since there is no conclusive nce that the duration of life of the corpus luteum menstruation) is rigidly constant; and, while the tory phase will be *attained* early in the cycle if ation is early, this phase will be *maintained* so long the corpus luteum remains active; the next menses not ensue until this body ceases its activity. ough, therefore, it may be stated with reasonable ainty that in the present case ovulation took place 10 days after the onset of menstruation in a ent with hitherto regular 28-day cycles, postulation the relation of ovulation to the hypothetical next ses cannot be utilised as reliable evidence for mating the duration of the postovulatory phase of cycle.

It is concluded that, in the absence of knowledge of day of ovulation, the structure of the endometrium not accurately indicate the day of the cycle to which the endometrium belongs. Further, postulation of ulation time in a given case and deductions based on ometrial structure without knowledge of the ovulation time are concluded to be unsafe indications for use in assessing the age of young embryos.

SUMMARY

The study of a young human embryo and of the maternal menstrual history has provided evidence that ovulation can take place early in the cycle, and that the histological structure of the endometrium on a particular day of the cycle is influenced by the remoteness of that day from the time of ovulation.

Deductions concerning the relation of ovulation to the expected onset of the next menses, based on the study of tubal ova and early embryos, cannot be considered to be conclusive.

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THYROIDECTOMY WITH BLOCK DISSECTION OF THE NECK FOR CARCINOMA OF THE THYROID GLAND

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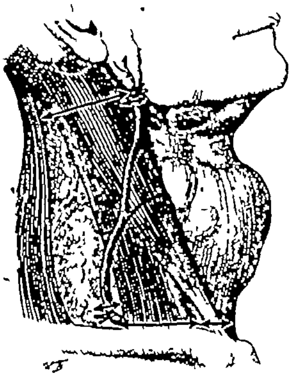
It is well known that carcinoma of the thyroid gland is apt to recur after partial thyroidectomy. Some patients have survived ten years, during which they have had several recurrences. To prevent such recurrences, especially the sternal, clavicular, and scapular so-called metastases, which are probably due to direct invasion along the muscles and aponeuroses, the need to resect the adjacent veins (Crile 1936) and muscles (Joll 1932, 1941) has been emphasised, and total thyroidectomy with block dissection of the neck has been advocated (Dargent and Bérard 1940, Lahey et al. 1940, Watson and Pool 1940) to ensure that all affected lymph-glands and any aberrant portions of the thyroid gland, which are particularly liable to be the seat of papillary cancer (Crile 1939), are extirpated, and to prevent metastasis through the blood-stream.

Under either local or intratracheal anæsthesia block dissection is done in several steps.

(1) A horizontal incision over the tumour meets an oblique incision along the sternomastoid muscle (fig. 1), and the two flaps are dissected and turned back. The two lobes of the thyroid gland are examined for confirmation of the diagnosis by biopsy if necessary.

I have seen three cases of nodular goitre, in patients aged over 50, which had been wrongly diagnosed as cancer. Other cases wrongly so diagnosed have included,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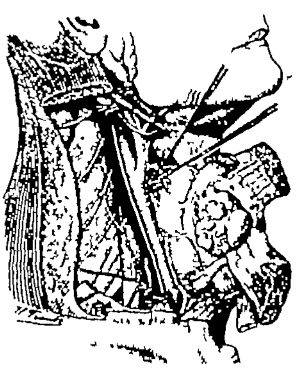
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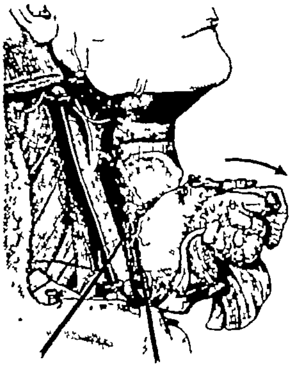
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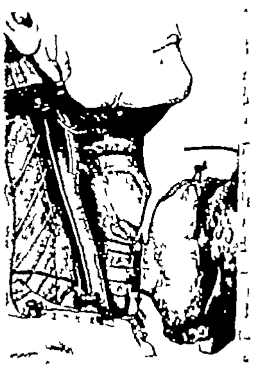
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Fig. 2—Resection of sternomastoid muscle and external jugular vein.
Fig. 3—Resection of facial, lingual, and superior thyroid veins and superior thyroid artery.
Fig. 4—Isolation of recurrent laryngeal nerve, with dissection of its accompanying lymph-glands.

Fig. 5—Isolation of trachea and ligation of thyroid veins. If t other lobe of the thyroid gland is sound, the isthmus is divi If not, the whole of the thyroid gland is removed, and t parathyroid glands are grafted in the stump of the sternomast muscle.

in my experience, hæmatocele of the thyroid gland, and acute congestion of the thyroid gland associated with indurated cervical lymph-glands due to cancer elsewhere (nævocarcinoma of skin, mammary cancer, and cancer of larynx).

(2) The sternomastoid muscle and the external jugular vein thus exposed are divided above and below (fig. 2) and resected, and the inferior belly of the omohyoid muscle is divided to expose the internal jugular vein. If examination of the thyroid gland shows that only one lobe need be extirpated, the internal jugular vein is tied above and below and resected. If, however, total thyroidectomy is to be done, the right and left internal jugular veins are carefully isolated by dissection; and, when the ablated thyroid has been examined, the vein draining the more affected lobe is resected, the other being left.

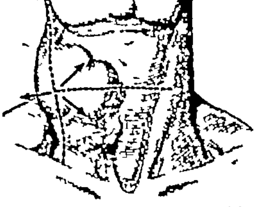
Fig. 1—Incisions for thyroidectomy and block dissection of neck.

(3) The facial and lingual veins are divided, and the superior thyroid vein on the side on which the internal jugular vein is not being resected is tied close to its junction with that vein. The superior thyroid artery can now be exposed and tied as high as possible (fig. 3). Sometimes it is difficult to free the upper pole of a carcinomatous thyroid gland from the thyroid cartilage without considerable oozing from the venules there. In securing hæmostasis care must be taken not to injure the external laryngeal nerve.

(4) After resection of the muscles lying under the thyroid the carcinomatous gland is displaced forwards, the inferior thyroid artery is divided, the recurrent laryngeal nerve is carefully isolated, and the chain of lymph-glands accompanying it is dissected away (fig. 4). Block dissection stops just short of the trachea. If one lobe of the thyroid gland is healthy, the isthmus is divided and its stump is sutured after hæmostasis (fig. 5). If total thyroidectomy is being done, the parathyroid glands are dissected away from the thyroid gland and immediately grafted into the stump of the sternomastoid muscle, and the internal jugular vein on the side of the less affected lobe is not interfered with. If necessary, the extirpation of the second lobe can be deferred to a second stage.

RESULTS

Comparatively few cases are suitable for thyroidectomy with block dissection of the neck. Since 1940 this operation has been done in only 16 of 210 cases seen at the Centre Anticancéreux at Lyons. Of the 210 patients, 34 were not fit for operation; 52 had only enough tissue removed to free the trachea; 33 were treated by radiotherapy alone; 30 underwent subtotal thyroidectomy without block dissection, including 1 who proved at operation to have simple goitre and no cance and 45 underwent extracapsular thyroidectomy witho block dissection.

Of the 16 cases submitted to thyroidectomy wi block dissection of the neck, in 2 the whole of the epithel matous thyroid gland was removed, but tetany did n develop, because the parathyroid glands were graft Within a year of operation both patients died fr metastases already present at the operation. Of t 14 patients subjected to unilateral thyroidectomy a block dissection of the neck, 1 died in hypoglycæn coma five days after the operation, and 2 patients still alive, without recurrence, three years after operati not followed by radiotherapy. Of the 11 other patien all of whom had a postoperative course of radiothera 1 has been lost sight of, 1 died of " Hodgkin's diseas four years later, and the remaining 9 survived 1–8 yea Of these, 1 already had a vertebral metastasis when was operated on, and he died of complications due paraplegia five years later. No recurrence or fre metastasis was found in any of these 9 patients.

One case was complicated by the presence of a bulk calcified carcinomatous thrombus in the internal jugul vein, making resection of the vein difficult owing to th calcareous projections which tended to tear the vein, a owing to bleeding from the thrombus. There were also sig of obliteration of the left innominate vein. The patient condition made it necessary to defer thyroidectomy to second stage. The growth in the thyroid gland proved be a Hürthle-cell carcinoma, and that in the thrombus vesicular carcinoma. The patient is still alive two yea after the operation.

RESULTS OF OTHER TREATMENTS

Freeing of Trachea.—Of the 52 patients in whol only enough tissue was removed to free the trache only 2 survived for more than five years (thanks radiotherapy.).

Radiotherapy.—Of the 33 patients submitted to radi therapy alone, 2 survived for more than five years, bu 6 developed metastases immediately after treatmen had ended.

Subtotal Thyroidectomy.—Of the 30 patients submitte to intracapsular subtotal thyroidectomy without bloc dissection of the neck 1 proved to have a simple goitr Of the 29 patients with cancer of the thyroid gland 26 were also treated by radiotherapy. Of the [illegible] survived for more than five years, but 18 had [illegible] eight postoperative recurrences.

Extracapsular Thyroidectomy.—Of the 45 patients [illegible] underwent extracapsular thyroidectomy without [illegible] dissection of the neck 28 were also treated by [illegible] therapy. Of these, 4 survived for more than five y[illegible] but 11 developed postoperative recurrences.

INDICATIONS FOR OPERATION

The decision to perform thyroidectomy with block dissection of the neck rests on the diagnosis of cancer of the thyroid gland. The best criteria are the rapidity growth of the tumour, its hardness, and paralysis of recurrent laryngeal nerve.

n a series of 131 cases confirmed histologically and including differentiated and 60 undifferentiated carcinomas the dence of these criteria was as follows: (1) 16 (28·6%) rentiated and 49 (81·7%) undifferentiated carcinomas d taken less than a year to develop; (2) 15 (26·7%) differen- ed and 51 (85%) undifferentiated carcinomas were typically d: and (3) 2 (3·5%) differentiated and 22 (36·6%) differentiated carcinomas were associated with paralysis f the recurrent laryngeal nerve.

Precedent goitre, associated thyrotoxicosis, and the ence of nodules in the neck are less characteristic cancer of the thyroid gland.

Early cancer of the thyroid gland may resemble mple goitre, in which case ordinary subtotal thyroid- tomy without block dissection of the neck will probably performed. Subsequent radiotherapy usually does t prevent recurrence. Therefore, as soon as a recurrence noted, the operation should be completed by total roidectomy with block dissection of the neck.

In the case of a rapid enlargement of the thyroid nd it is advisable to do an exploratory cervicotomy see whether or not the tumour is due to thyroiditis to struma lymphatosa, both of which simulate scirrhous rcinoma and should be treated by radiotherapy.

With a slowly growing cancer of the thyroid gland, en if metastases are already present or if the overlying n has been invaded, thyroidectomy with block dis- ction of the neck should be performed, because it will event further metastases, which otherwise are almost vitable.

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PENETRATION OF CERVICAL MUCUS BY SPERMATOZOA

A METHOD OF INVESTIGATION

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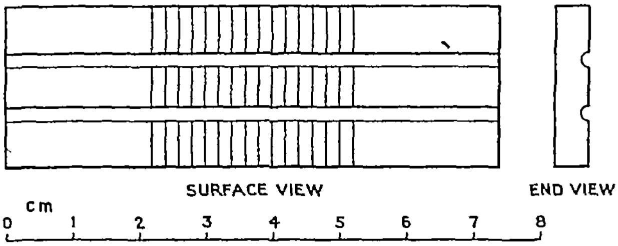
PREVIOUS methods described for investigating the y of spermatozoa into cervical mucus, such as capillary-tube method of Lamar et al. (1940) and the erslip method of Barton and Wiesner (1946), use stem in which mucus and spermatozoa are under siderable stress. The surface tension in mucus between a slide and coverslip, or in a capillary tube, t be very large relative to the energy of a progressing matozoon. Moreover, dead spermatozoa may be n across a film of mucus between slide and cover- by capillarity. Abarbanel (1946), using the capillary- method, found "grossly abnormal" spermatozoa ding cervical mucus. This suggests that here also tion is acting, for we have found fewer than 1% of orphic sperm heads in more than 10,000 spermatozoa mined in stained films of postcoital mucus; and stained films of in-vitro penetration, obtained by the method described below, support the inference that very few abnormal spermatozoa can penetrate mucus.

The present method was devised to reduce interference from surface tension. The special slide used was made to our design by W. Watson and Son Ltd. It is not unlike a Thoma counting slide with the grooves running parallel to the long axis instead of transversely, but the strip between the grooves is at the same level as the rest of the surface. The central region is marked for 3 cm. with transverse etched lines 2 mm. apart.

Mucus used for penetration tests must not contain any spermatozoa at the beginning of the test. If it is desired to test a wife's mucus against her husband's semen, the couple should be asked to avoid intercourse for 8–10 days before the mucus is extracted. All mucus should be examined for the presence of spermatozoa before it is used.



Cervical mucus slide.

METHOD

The mucus is spread over the central strip of the slide, in the region of the etched lines. It should be thin enough for the lines to show as faint shadows when the surface of the mucus is viewed with a $^2/_3$ in. objective, but thick enough not to draw away from the edges of the strip. Too thin a film should not be used.

About 0·05 ml. of semen is placed near one end of the mucus, and the drop is stroked gently with a platinum loop until the mucus is in contact with the semen for the whole width between the grooves. These grooves prevent the seepage of semen round the edges of the mucus, and maintain a standard width of surface between mucus and semen. Some semen seeps over the surface of the mucus but does not usually extend beyond 2–4 mm. It can be minimised by having a rather thick layer of mucus at the junction.

The slide is incubated at 37°C in a petri dish floored with wet filter-paper and sealed with soft paraffin. It is examined under a $^2/_3$ in. objective at any convenient intervals between 30 min. and 3 hours from the beginning of the test. No coverslip is used. In this way capillary forces are avoided except those at the fluid interface and between the mucus and the slide. Another advantage is that the test can be set up in 2 min.

For examination, the slide is placed so that the junction of semen and mucus at the end of the semen overrun is in focus, and the activity of the spermatozoa in the semen drop is noted. The slide is next moved until one of the etched lines has been crossed. (If, owing to opacity of the mucus, the lines are difficult to see, they may be located by examining the uncovered side strip of the slide.) The presence or absence of spermatozoa and their activity between this line and the next are recorded, and the slide is then moved again and the observation repeated for each 2 mm. section until no spermatozoa are found in five microscope fields in each of two adjacent sections. The search is then abandoned, and the slide can be returned to the incubator. In practice we have found that little or no increase in the distance penetrated takes place after one hour. To establish with certainty that spermatozoa are absent from the mucus beyond the last point observed with the low power, the mucus can be separated in the following way:

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A square coverslip held vertically is placed with one edge pressed firmly on the etched line 4 mm. beyond the last observed spermatozoa. The mucus beyond this is removed with the edge of a second coverslip and placed on an ordinary slide, where it can be covered and examined carefully with a $^1/_6$ in. objective.

APPLICATION

With this special slide different types of penetration can be compared by noting (1) the greatest distance reached by the spermatozoa in a given time, (2) their motility in the mucus, (3) the relative numbers of spermatozoa reaching points at various distances from the semen-mucus junction, and (4) the course of the spermatozoa within the mucus. Lack of homogeneity in the mucus can be detected by the behaviour of the spermatozoa.

The following types of penetration can be recognised, though they grade into one another:

(1) Complete failure of the spermatozoa to enter the mucus, or entry confined to a zone less than 0·2 cm. wide adjacent to the semen-mucus junction.

(2) Spermatozoa enter slowly and travel 0·5–1·5 cm. in an hour, when progress ceases. Usually few spermatozoa go further than 0·5 cm.

(3) Spermatozoa enter rapidly and after an hour's incubation are found active from the edge of the semen overrun to the farther edge of the mucus, a distance of 2·5–3·0 cm., according to the quantity of mucus used. But the numbers in the region farthest from the semen are much fewer, and the activity less, than in the first centimetre.

(4) Entry as in (3) but much more rapid, and complete. Within half an hour, or less, spermatozoa are swarming throughout the mucus.

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PARKINSONISM TREATED WITH PARPANIT

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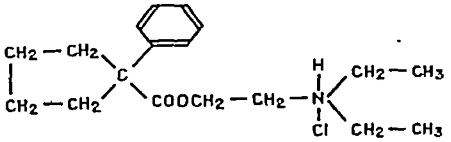
FAVOURABLE reports from Switzerland and other countries on the treatment of parkinsonism with 'Parpanit' led to the trial of this drug at the National Hospital, Queen Square.

Parpanit, a synthetic compound, was found by Grünthal (1946) to cause subjective sensory disturbances when given to healthy people. He thought that the drug might act on the proprioceptive sensory system and therefore might be of some use in the treatment of conditions characterised by muscle rigidity. After clinical trials he concluded that parpanit was of benefit in the treatment of parkinsonism. Later Hartmann (1946, 1947), in a large series of cases, confirmed Grünthal's results. Llavero, in Madrid (unpublished report), and Bickel and Dubois (1947) confirmed Hartmann's findings.

Parpanit, chemically closely related to antispasmodics such as 'Trasentin' and 'Dolantin,' has the following structure:



From the pharmacological studies of Domenjoz (194 and Heymans and De Vleeschhouwer (1947) it is cle that parpanit has atropine-like activity, but these studi do not explain why it should benefit parkinsonis (In the case of the solanaceous drugs we are similar ignorant.)

Tremor and weakness are the commonest symptom and tremor and rigidity the most striking signs, parkinsonism. The patient, or an observer, can readi appreciate any considerable change in the severity the disability, but, since tremor and rigidity va from minute to minute, objective assessment of min changes produced by treatment is difficult. We ther fore based our assessments of tremor and facility movement (under which heading are considered slowne of movement, difficulty in initiating movement, a lack of ability to perform intricate manipulations) the patients' subjective impressions, obtaining objecti confirmation, however, wherever possible. We estimat rigidity in arms and legs by a constant technique which repeated and irregularly spaced passive movemen were performed. Effects on salivation and vision well as such symptoms as giddiness and paræsthes were recorded as reported by the patient.

In all, 25 patients with parkinsonism were carefu observed. All were moderately severely affected. Po encephalitic parkinsonism and paralysis agitans w about equally represented. All the patients had b receiving solanaceous drugs in optimal doses for m than a year, and all had been under regular observati as outpatients for at least that period; 4 patients w admitted to hospital for more detailed study. T investigation was conducted in six parts. The resu obtained at each stage are described in turn. Th significance and the side-effects observed are discus subsequently.

METHOD OF ADMINISTRATION AND RESULTS

Part I

In addition to their usual solanaceous medicat 8 patients were given inert control tablets.

After a week, no change in their condition was reporte or observed.

Part II

To 19 patients, in addition to their usual solanaceo medication, parpanit was given in increasing dos until disturbing side-effects were observed.

At first, parpanit 0·0125 g. was given thrice dai after food; the morning, then the midday, then t evening doses were then increased on consecutive da by amounts not greater than half the correspondi dose for the preceding day, until unpleasant side-effec precluded further increase. Where benefit was obtaine the interval between doses was decreased and th number increased to obtain as even a level of effect possible. At this stage a decrease in the size of ea dose was sometimes necessary. Though hourly doses (many as fifteen daily) were given a trial, it was fou equally satisfactory to give the doses three-hourly four-hourly. The optimal individual doses varied fro 0·025 to 0·1 g.

On such dosage, 5 patients obtained definite subjecti improvement while taking parpanit, and a furth 4 reported slight improvement, 7 obtained no benefi and the remaining 3 felt worse. Of individual signs an symptoms, tremor was reported as reduced in 7, unaltered in 6, and as increased in 6, though observatio revealed no change in any. 10 patients noted improve facility of movement; 9 found no change. In 1 patie side-effects outweighed the improvement in othe directions, and in 4 others they were severe enough t be disturbing. The degree of benefit was never grea In only 4 was a slight improvement in gait observe es. Greater dexterity with cutlery at meals was ined by 2 patients and confirmed by their relations. In the 16 patients initially showing rigidity this was reased in 4, unaltered in 8. and increased in 2. The aining 2, feeling worse on the treatment, omitted it ore examination. In no case was the change pro- nced. Patients showing improvement have been ed for as long as thirty weeks without relapse. the 8 patients previously given control tablets rt I) 7 were included in this series. Of these, 4 were htly improved, 2 unchanged, and 1 worse.

t III

From 17 patients on optimal doses of parpanit with aceous drugs the latter were gradually withdrawn. These patients were the same as those already reported in part II, except that 2 of the 3 made worse by panit were omitted. As compared with their con- on on solanaceous drugs alone, 6 patients reported provement, 2 slight improvement, 5 no change, and terioration on parpanit. 4 found the tremor reduced, unchanged, and 6 increased. Facility of movement s stated by 7 to be increased, by 6 to be unchanged, d by 4 to be reduced. Rigidity showed an increase 1 of these patients, was unaltered in 9, and was uced in 3. 4 showed no rigidity. Further adjustment the parpanit dosage was without benefit. During ht weeks of this treatment no patient who had proved relapsed. None of these changes were pro- nced, with perhaps one exception. One man volun- ered that on parpanit he was able to dry himself after bath, which he had not previously been able to do. s increased facility of movement, however, was not ected in other activities, such as donning his overcoat walking.

t IV

Solanaceous and parpanit tablets were abruptly changed in 3 hospital inpatients.

Tablets of the two drugs, identical in appearance, given to 2 of the patients in this group. The -over of drugs passed unnoted by 1 patient; other the change in side-effects alone caused its nition. The third patient, who knew of the change medication, reported slightly improved facility of ement, but, since this persisted when a return to naceous drugs was made, this improvement must considered of doubtful significance. In none of these nts, despite careful observation by medical, nursing, physiotherapy staffs, was any objective alteration signs or behaviour noted. These 3 patients were cted for admission to hospital on economic grounds e. The dosage of both drugs was that which had viously been adjudged optimal.

t V

Inert tablets were substituted for parpanit when this being given alone in optimal dosage, the patients g unaware of the alteration (2 patients).

Previously 1 patient in this group had thought parpanit effective as the solanaceous drugs; the other had ght it more so. On the substitution of inert tablets hout the patients' knowledge, so great an exacerbation their disability was produced that they were almost pletely immobilised. (See case-record.)

t VI

Inert tablets were substituted for parpanit while full es of solanaceous drugs were also being given (2 tients).

These 2 patients, who had previously benefited mewhat from the addition of parpanit, noted slight rease in their symptoms on its substitution by inert lets. The tablets were changed in each case without knowledge of the patient. No objective change s detected.

Side-effects of Parpanit.—The tolerance to parpanit varied from patient to patient, and where benefit was obtained unpleasant side-effects began to intrude. Giddiness, a feeling of weakness, drowsiness, and paræsthesiæ developed in that order of frequency both when parpanit was given alone and when solanaceous drugs were given in addition. Hallucinosis was met with only twice, on both occasions on the combined medication. Increased blurring of vision and dryness of the mouth were complained of by 3 patients, again on combined drugs. Given alone, parpanit produced notable dryness of the mouth twice and blurring of the vision 3 times, but in both instances this was less than that produced by the usual solanaceous medication. In 6 patients hypersalivation, and in 1 rhinorrhœa, developed when the solanaceous drugs were omitted, despite the administration of parpanit. Giddiness, a sensation of weakness, and drowsiness were more common when parpanit was taken on an empty stomach, coming on usually $^1/_4$–$^1/_2$ hr. after a dose and lasting from a few minutes to about an hour. It was during the presence of these side-effects (if these were not too severe) that the maximal benefit was obtained. Throughout, careful sensory testing did not reveal any abnormality, and no changes in the tendon-reflexes were detected.

DISCUSSION

The results of this investigation have confirmed the usefulness of parpanit in parkinsonism. No striking differences in therapeutic activity were seen on replacing solanaceous drugs by parpanit, though minor changes were observed. Sometimes one drug, sometimes the other, seemed more beneficial. In contrast to this, our case-notes show that, in the absence of parpanit, the withdrawal of solanaceous drugs had previously produced a considerable recrudescence of symptoms in 8 of the 14 of our patients in whom this had been tried. As would be expected, there was a similar recrudescence of symptoms when parpanit, given alone to a patient on whom it was therapeutically active, was withdrawn. Some patients derived no benefit from either form of medication. Though as many as 15 doses have been given daily, it was found equally satisfactory to give the doses three-hourly or four-hourly. The optimal individual doses varied from 0·025 to 0·1 g.

Where parpanit was effective it was equally so whether it was added to or took the place of solanaceous drugs; when combined medication was being given, withdrawal of either produced only minor effects.

The side-effects of parpanit were similar to those of the solanaceous drugs, but their relative frequency and intensity were different. Thus, whereas giddiness, a sensation of weakness, dryness of the mouth, and blurring of vision developed with both, the first two predominated with parpanit and the last two with solanaceous medication. This is of some importance, because it is as often upon the nature of the side-effects as upon the degree of the therapeutic effects that the patient may base his choice. In this investigation side-effects were more troublesome on the combined medication.

There seem to have been no criteria by which we could have forecast the therapeutic value of either drug to any individual patient, except that, in general, those who had responded well to the solanaceous drugs responded also to parpanit.

ILLUSTRATIVE CASE-RECORD

A man, aged 68, had had tremor of the left arm for eight years. His chief complaints were unsteadiness in walking, difficulty in rising from a chair, tremor, and increased salivation. Tr. stramonii had been taken in doses of min. 20 thrice daily for four years, larger doses not being tolerated because of dryness of the mouth and blurring of vision. (As a maximal dose this is in our experience unusually small.)

RIGIDITY IN A CASE ON VARIOUS TREATMENTS

Line	Drug and dosage	Wrists		Elbows		Shoulders		Ankles		Knees	
		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
1	Tr. stramonii min. 20 t.d.s. ..	cw +	cw +	cw +	..	lp +	lp +	..	..	..	..
2	Tr. stramonii min. 20 t.d.s. Inert tablets	lp +	cw +	cw +	lp +	lp +	lp + +	lp +	..	lp + –	lp +
3	Tr. stramonii min. 20 t.d.s. Parpanit 0·1 g. t.d.s. ..	cw +	cw +	cw +	cw +	..	..	lp +	lp +	lp + + +	lp +
4	Parpanit 0·1 g. t.d.s. ..	..	cw +	cw + +	cw +	..	..	..	..	cw +	..
5	Inert tablets	cw + +	cw +	cw + +	cw +	lp + + +	lp + +	cw + +	cw +	lp + +	lp +
6	Inert tablets	cw + +	cw + +	lp + +	cw +	lp + + +	lp + +	lp + +	cw + +	lp + + +	lp + +
7	Parpanit 0·025 g. six times daily	cw +	cw +	lp +	lp +	lp + +	lp +	..	..	cw + –	cw +
8	Hyoscine gr. $^{1}/_{100}$ six times daily	..	..	lp +	lp +	lp +	lp +	..	..	lp + +	lp +
9	Parpanit 0·025 g. six times daily	cw +	..	lp +	lp +	lp +	lp +	..	..	lp +	lp +
10	Hyoscine gr. $^{1}/_{100}$ t.d.s. *Parpanit 0·025 g. five times* daily	..	..	..	..	lp +	lp + +	..	..	..	lp +
11	Tr. stramonii min. 20 t.d.s...	lp +	cw +	cw +	lp +	lp +	lp + +	lp +	..	lp + +	lp +

lp = "lead-pipe" rigidity. cw = "cog-wheel" rigidity. + = rigidity just detectable. + + = moderate rigidity.
+ + + = rigidity requiring effort to produce passive movement.

Examination revealed flexed posture and festinant gait, mask-like facies, monotonous weak voice, and tremor of the left arm and of both legs, of moderate severity. Voluntary movements were slow, but muscular power was normal. Rigidity varied from day to day (a representative single finding is shown on line 1 in the accompanying table).

Inert tablets, 2 t.d.s., were administered in addition to the stramonium for a week, with no change in symptoms. Rigidity was of the same order as before (line 2 of table). Parpanit was then given in doses increasing from 0·0125 to 0·1 g. t.d.s. for three weeks, the stramonium being continued. Occasional giddiness was noted, coming on $^{1}/_{4}$–$^{1}/_{2}$ hr. after the tablets were taken and lasting up to $^{1}/_{2}$ hr. Tremor was unaffected, and festination was somewhat increased. A tired feeling in the feet was complained of. Rigidity was of the same order as before (line 3 of table). Stramonium was now reduced, and, after three weeks, omitted. The patient reported increased intermissions in his tremor, and increased ease in rising from a chair. The feet sometimes felt very heavy. Rigidity was again of the same order (line 4 of table). Without the patient's knowledge inactive control tablets of identical appearance were now substituted for the parpanit. Five days later the patient requested a visit, since he could not now attend the outpatient department because of a feeling of weakness and a difficulty in initiating movements. The previous night these had been so pronounced that he had urinated in bed, being unable to climb out. When seen, his face was a more rigid mask, his posture more flexed, and his movements slower. Tremor was notably greater, and rigidity was greater than had been found previously (line 5 of table). The patient was admitted to hospital.

He was observed for a week without any drugs being given. During this period there was no subjective or objective change, rigidity being as shown in line 6 of the table. Parpanit 0·025 g. four times daily, increasing to six times daily, was then given. On this régime, within twenty-four hours, walking became easier, posture showed a slight improvement, and the patient could get in and out of bed without difficulty. Tremor was not appreciably affected, and giddiness recurred. Rigidity decreased (line 7 of table). After parpanit had been given for eighteen days with no further change, tablets of hyoscine gr. $^{1}/_{200}$ of identical appearance were substituted, being given four times daily. The change was effected without the knowledge of the patient. The mouth became uncomfortably dry, and walking was reported as being somewhat easier, but otherwise no change was noted, rigidity being as shown in line 8 of the table. There was occasional giddiness.

After the patient had been five days on hyoscine, a return to the previous dose of parpanit was made, again without the patient's knowledge. Two days later he was told the change, and was asked which drug he preferred. could not decide. No change in his condition had b noted by the medical, nursing, or physiotherapy staff attendance; rigidity was as shown in line 9 of the table.

A further reversion to inert control tablets again precipit a relapse, and the patient was started again on parpa with a return to his previous condition on this treatm He was discharged from hospital, but on his return h he added hyoscine gr. $^{1}/_{200}$ t.d.s. to the parpanit 0·02 five times daily which he had been instructed to take. N day he called in his neighbours to help him eject imagin strangers from his room, and the following day he [illegible] his servant, already alarmed at his clumsy manipulation his cutlery at table, to eject another stranger from favourite chair. The servant informed us, and on [illegible] the patient we confirmed his ataxia, and noted unalter tremor and somewhat reduced rigidity (line 10 of tabl Parpanit dosage was halved, and there were no furth hallucinations. Giddiness however was troublesome, after a further fortnight parpanit was omitted, stramoni being given in the original dosage. Giddiness disappear The general condition was about the same as it had b on parpanit, on hyoscine, and on stramonium initial Rigidity a month later was as shown in line 11 of the tab

This patient, then, shows the day-to-day variatio of rigidity on constant treatment characteristic parkinsonism (compare lines 1 and 11 in the tabl What were considered significant changes in rigidi were seen only on the omission of all drugs (lines 5 and and on the administration of a combined parpanit a solanaceous dosage which proved toxic (line 10 of tabl No objective evidence of difference in type or deg of therapeutic activity between parpanit and solanaceo drugs was shown by this patient, who could not ev distinguish between the subjective effects. Either dru however, could prevent the severe recrudescence symptoms and signs which arose on the withdrawal all drugs.

SUMMARY

The therapeutic activity of parpanit has bee compared with that of solanaceous drugs in maxim tolerated doses in patients with parkinsonism.

Parpanit appears to have an activity comparable t that of solanaceous drugs.

The side-effects of parpanit differ in relative intensit and from those produced by the solanaceous drugs, preference for one or other treatment may be determined by this, as much as by the small differences between the therapeutic effects.

We wish to thank Dr. E. Arnold Carmichael, of the National Hospital, Queen Square, for access to the cases treated and for invaluable advice and criticism; Dr. Kurt Hartmann, of Zurich, for advice; and Pharmaceutical Laboratories Geigy and Messrs. H. R. Napp Ltd. for supplying generous amounts of drugs. The investigation was undertaken on behalf of the Medical Research Council.

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FAMILIAL OUTBREAK OF STAPHYLOCOCCAL INFECTION OF BONE AND JOINT

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STAPHYLOCOCCAL infections in a community are sufficiently commonplace to pass without comment, but this familial outbreak is reported because of two unusual features. First, in a family of seven children there were, besides multiple examples of cutaneous infections, three cases of acute infection of bone or of joint. Two children developed acute suppurative arthritis and the third an acute osteomyelitis, and all three patients were in hospital at one time. Secondly, the strain of the causal staphylococcus was found to be the same in each of these major lesions, and the same organism was recovered from other members of the same family. The family of nine live under rather crowded conditions in an Oxfordshire village. The following is a summary of the family and their illnesses:

ie.—Aged 1 year, had impetigo in January, 1947, which cleared under local penicillin therapy. *Staphylococcus aureus* (phage type 29/31) was recovered from his nasal mucosa in April, 1947.

Christopher.—Aged 3 years, had no known lesion.

Ernest.—Aged 4 years, had impetigo in December, 1946, which cleared under local penicillin therapy. He had a boil over a medial malleolus in March, 1947, and acute septic arthritis of the right knee in April, 1947. *Staph. aureus* (phage type 29/31) was recovered from the knee-joint and blood-culture. A staphylococcus recovered from his nasal mucosa was not typable.

Brian.—Aged 7 years, had impetigo and boils on his heels in January, 1947, which cleared under local penicillin therapy. He had acute osteomyelitis of left pubis and right radius in April, 1947. *Staph. aureus* (phage type 29/31) was recovered from blood-culture.

Eric.—Aged 11 years, had no known lesion.

Mavis.—Aged 12 years, had suppurative arthritis of the right hip in February, 1947. Staphylococcus (phage type 29/31) was recovered from blood-culture and hip-joint, and phage type 47 from nasal mucosa and skin swabs.

Beryl.—Aged 14, had no known lesion, but *Staph. aureus* (phage type 29/31) was recovered from her nasal mucosa.

Mother.—Aged 34, had no known lesion. An untypable staphylococcus was recovered from skin swabs.

Father.—Aged 37, had a chronic discharging ear, but no staphylococci were recovered from the discharge.

TREATMENT AND RESULTS

The three cases of bone and joint involvement were all under the care of Dr. J. Trueta in the Wingfield-Morris Orthopædic Hospital, and were all treated by a similar method.

(1) Penicillin was administered by a continuous intramuscular drip delivering 400,000 units a day as the initial dose, decreasing to 200,000 units a day as progress became satisfactory. In addition, one of the children was given sulphadiazine 14 g. by mouth.

(2) The affected part was immobilised. Ernest, with acute septic arthritis of the knee, was placed in a posterior portion of a split plaster hip spica. Brian, with acute osteomyelitis of the pubis and radius, was placed on a Robert Jones double abduction frame, and a plaster back slab was applied to the affected upper limb. Mavis, with acute septic arthritis of the hip, was placed on a Robert Jones double abduction frame.

(3) When, on the child's admission to hospital, pus was considered to be already present, the lesion was explored with a view to removing it. In Ernest's case, diagnostic aspiration of the knee-joint having yielded pus, under general anæsthesia and a tourniquet an arthrotomy was performed, the pus and fibrin were removed, and the joint was closed. On three subsequent occasions he underwent aspiration of the joint and instillation of penicillin. In Mavis's case, 35 ml. of pus was removed by aspiration from the hip-joint and replaced with penicillin.

(4) When on admission, however, the physical signs and response to treatment suggested that the lesion had not yet progressed to suppuration, conservative measures were found to be adequate. Thus Brian, who had the double bone lesion, recovered completely with penicillin treatment alone.

The results were as follows. Nine months later Ernest's knee was cool and dry, with a full range of active movement, and Brian had full function in his arm and pelvic joints with no residual tenderness. Mavis's arthritis of the hip flared up again five weeks after admission. Eleven months later she has a good gait and function, but radiography suggests some reduction of the joint space in the affected hip, and there is half an inch of real shortening and restriction of full flexion of that joint.

DISCUSSION

In all cases a blood-culture was made before treatment was begun, and any pus recovered from the cases was sent for bacteriological examination. The organisms recovered from all these children were reported as *Staph. aureus*, and all were found to have the same cultural characteristics. A further attempt was made to establish their identity by bacteriophage typing[1] and they were all reported as phage type 29/31. About half of all pathogenic staphylococci cannot be phage typed at all, but of the remainder some fifty different strains can be differentiated by their reactions. The fact, therefore, that these five strains were all of the same phage type seems a reasonable indication that they had originated from a common source.

Despite careful investigation of the home environment no direct source of the organism could be traced, but the close living conditions were almost certainly responsible for the multiplicity and persistence of the infection.

Acute pyogenic infections of bone or joint, though by no means uncommon, are not an everyday occurrence, and the surprise which greeted the arrival in the ward of the second case from the same family grew almost to incredulity when the third child appeared. I have not been able to find any comparable published report.

SUMMARY

In a family of seven children described, there were, besides multiple examples of cutaneous infections, three cases of acute infection of bone or of joint. The infecting organism was a *Staph. aureus*, demonstrated by bacteriophage typing to be the same in all three cases and the same as that recovered from the nasal mucosæ of two of the remaining four children of the family.

I wish to thank Dr. J. Trueta and Mr. J. C. Scott for their kind permission to publish these cases; Dr. J. R. O'Brien for the bacteriological examinations; and Dr. V. D. Allison, of the Staphylococcal Reference Laboratory, Colindale, London, for bacteriophage typing all the organisms.

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RIGIDITY IN A CASE ON VARIOUS TREATMENTS

Line	Drug and dosage	Wrists		Elbows		Shoulders		Ankles		Knees	
		Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
1	Tr. stramonii min. 20 t.d.s. ..	cw +	cw +	cw +	..	lp +	lp +	..	..	..	..
2	Tr. stramonii min. 20 t.d.s. Inert tablets	lp +	cw +	cw +	lp +	lp +	lp + +	lp +	..	lp + +	lp +
3	Tr. stramonii min. 20 t.d.s. Parpanit 0·1 g. t.d.s. ..	cw +	cw +	cw +	cw +	..	..	lp +	lp +	lp + + +	lp +
4	Parpanit 0·1 g. t.d.s. ..	..	cw +	cw + +	cw +	..	..	..	..	cw +	..
5	Inert tablets	cw + +	cw +	cw + +	cw +	lp + + +	lp + +	cw + +	cw +	lp + +	lp +
6	Inert tablets	cw + +	cw + +	lp + +	cw +	lp + + +	lp + +	lp + +	cw + +	lp + + +	lp +
7	Parpanit 0·025 g. six times daily	cw +	cw +	lp +	lp +	lp + +	lp +	..	..	cw + +	cw +
8	Hyoscine gr. $^1/_{200}$ six times daily	..	..	lp +	lp +	lp +	lp +	..	..	lp + +	lp +
9	Parpanit 0·025 g. six times daily	cw +	..	lp +	lp +	lp +	lp +	..	..	lp +	lp +
10	Hyoscine gr. $^1/_{200}$ t.d.s. Parpanit 0·025 g. five times daily	..	..	..	..	lp +	lp + +	..	..	..	lp +
11	Tr. stramonii min. 20 t.d.s...	lp +	cw +	cw +	lp +	lp +	lp + +	lp +	..	lp + +	lp +

lp = "lead-pipe" rigidity. cw = "cog-wheel" rigidity. + = rigidity just detectable. + + = moderate rigidity.
+ + + = rigidity requiring effort to produce passive movement.

Examination revealed flexed posture and festinant gait, mask-like facies, monotonous weak voice, and tremor of the left arm and of both legs, of moderate severity. Voluntary movements were slow, but muscular power was normal. Rigidity varied from day to day (a representative single finding is shown on line 1 in the accompanying table).

Inert tablets, 2 t.d.s., were administered in addition to the stramonium for a week, with no change in symptoms. Rigidity was of the same order as before (line 2 of table). Parpanit was then given in doses increasing from 0·0125 to 0·1 g. t.d.s. for three weeks, the stramonium being continued. Occasional giddiness was noted, coming on $^1/_4$–$^1/_2$ hr. after the tablets were taken and lasting up to $^1/_2$ hr. Tremor was unaffected, and festination was somewhat increased. A tired feeling in the feet was complained of. Rigidity was of the same order as before (line 3 of table). Stramonium was now reduced, and, after three weeks, omitted. The patient reported increased intermissions in his tremor, and increased ease in rising from a chair. The feet sometimes felt very heavy. Rigidity was again of the same order (line 4 of table). Without the patient's knowledge inactive control tablets of identical appearance were now substituted for the parpanit. Five days later the patient requested a visit, since he could not now attend the outpatient department because of a feeling of weakness and a difficulty *in initiating* movements. The previous night these had been so pronounced that he had urinated in bed, being unable to climb out. When seen, his face was a more rigid mask, his posture more flexed, and his movements slower. Tremor was notably greater, and rigidity was greater than had been found previously (line 5 of table). The patient was admitted to hospital.

He was observed for a week without any drugs being given. During this period there was no subjective or objective change, rigidity being as shown in line 6 of the table. Parpanit 0·025 g. four times daily, increasing to six times daily, was then given. On this régime, within twenty-four hours, walking became easier, posture showed a slight improvement, and the patient could get in and out of bed without difficulty. Tremor was not appreciably affected, and giddiness recurred. Rigidity decreased (line 7 of table). After parpanit had been given for eighteen days with no further change, tablets of hyoscine gr. $^1/_{200}$ of identical appearance were substituted, being given four times daily. The change was effected without the knowledge of the patient. The mouth became uncomfortably dry, and walking was reported as being somewhat easier, but otherwise no change was noted, rigidity being as shown in line 8 of the table. There was occasional giddiness.

After the patient had been five days on hyoscine, a return to the previous dose of parpanit was made, again without the patient's knowledge. Two days later he was told the change, and was asked which drug he preferred. could not decide. No change in his condition had b noted by the medical, nursing, or physiotherapy staff attendance; rigidity was as shown in line 9 of the table.

A further reversion to inert control tablets again precipit a relapse, and the patient was started again on parpa with a return to his previous condition on this treatm He was discharged from hospital, but on his return h he added hyoscine gr. $^1/_{200}$ t.d.s. to the parpanit 0·02 five times daily which he had been instructed to take. N day he called in his neighbours to help him eject imagin strangers from his room, and the following day he as his servant, already alarmed at his clumsy manipulation his cutlery at table, to eject another stranger from favourite chair. The servant informed us, and on visit the patient we confirmed his ataxia, and noted unalter tremor and somewhat reduced rigidity (line 10 of tabl Parpanit dosage was halved, and there were no furth hallucinations. Giddiness however was troublesome. after a further fortnight parpanit was omitted, stramoni being given in the original dosage. Giddiness disappear The general condition was about the same as it had b on parpanit, on hyoscine, and on stramonium initial Rigidity a month later was as shown in line 11 of the ta

This patient, then, shows the day-to-day variati of rigidity on constant treatment characteristic parkinsonism (compare lines 1 and 11 in the tabl What were considered significant changes in rigidi were seen only on the omission of all drugs (lines 5 and and on the administration of a combined parpanit a solanaceous dosage which proved toxic (line 10 of tabl No objective evidence of difference in type or deg of therapeutic activity between parpanit and solanaceo drugs was shown by this patient, who could not ev distinguish between the subjective effects. Either dru however, could prevent the severe recrudescence symptoms and signs which arose on the withdrawal all drugs.

SUMMARY

The therapeutic activity of parpanit has be compared with that of solanaceous drugs in maxim tolerated doses in patients with parkinsonism.

Parpanit appears to have an activity comparable that of solanaceous drugs.

The side-effects of parpanit differ in relative intensit from those produced by the solanaceous drugs, an

k. He also noticed, but did not date, an outcrop of ll lumps over his whole body, even in his tongue. There no history of any such disorder in his family or in his ge. His work as a sweeper entailed dealing with refuse excreta, and as in most Indian villages there were e rooting about. He had eaten pork.

He was well built and muscular, with remarkable symtrical hypertrophy of the calves (circumference of right calf 16½ in., left 18 in.). His body was studded with many hundreds of small nodules, chiefly in forehead, chin, neck, upper arms, shoulder girdle, pectorals, thighs, and lower legs. Two translucent nodules in mucosa of tongue. No abnormal signs in cranial nerves or in arms. Calf muscles very weak; and patella and achilles reflexes absent; plantar responses flexor. No sensory change.

Radiography of skull, muscles, and chest revealed no abnormality. A typical cysticercosal cyst was removed from the chest wall. Incision of calf showed whole substance of muscle superseded by a grape-like mass of many hundreds of cysts. Three were removed and again found to be cysticercosal cysts.

cercosis (case 2) ing enlarged calves.

DISCUSSION

Even without the palpation of cysts, this type of cysticercosis may be readily distinguished from muscular dystrophy by several features. Muscular dystrophy develops much earlier in life, and the latissimus dorsi cle and the lower part of the pectoralis major cle are not involved in the pseudohypertrophy ttrass 1938). In trichiniasis there may be general- muscular swelling, but the muscles are painful more obviously œdematous, and the illness is

case 1 permission to incise the calves was refused, case 2 is complementary in this respect.

case 1 the œdema and swelling of the muscles due probably to the simultaneous growth of many . MacArthur (1937) recognises an occasional lised or generalised œdematous swelling of muscles premonitory symptom. In Priest's (1926) case ly all the muscles were enlarged, especially those of shoulder girdle, giving the appearance of a powerful n of the Sandow type of development, whereas in lity the muscular power was very feeble. Manson-Bahr 45) notes that sometimes the localised intramuscular llings resemble a muscular dystrophy.

The primary undiagnosed fever in each case may present the period of invasion, comparable with the and-fly fever," "headache," "migraine," "P.U.O.," d "clinical malaria" suggested by Dixon and greaves (1944) as prodromata.

Case 1 almost certainly had a cyst in the left frontal a, and the initial provisional diagnosis of frontal mour, based on headache; changed personality, a right sp reflex, and a right extensor plantar reflex, had not n far short of the mark. The later development of lariousness, joking, and almost *Witzelsucht*, with a ised cell count and protein in the C.S.F., makes the milarity closer still.

The eosinophil response has been of little diagnostic value previously (MacArthur 1933–34, 1937, Dixon and Hargreaves 1944), but it was the sudden appearance of moderate eosinophilia coupled with the palpation of three cysts that led to the diagnosis in case 1. Eosinophilia was absent when only one cyst was palpable in November, 1944. The moderate eosinophilia which later developed remained unchanged for more than four months before returning to normal. MacArthur believes that an eosinophilia may develop when the cysts are breaking down and liberating their contents, but the onset of eosinophilia in case 1 coincided approximately with the appearance in the muscles of many viable cysts. Lipscomb's (1935) case showed an eosinophilia of 12%, associated with fever, three other counts in apyrexial periods being normal for eosinophils.

The present two cases also confirm the opinion of Dixon and Smithers (1934) that the palpable subcutaneous cyst may be alive.

Menon and Veliath (1940) found at necropsy that the most notable feature in the histology of the cyst wall in the brain was a plasma-cell reaction in the capsule, and suggested that a cytological study of the C.S.F. for the demonstration of these cells might prove of diagnostic importance. With this in view the fluid was re-examined under the most favourable conditions possible, but no plasma cells were seen after a long search.

At no time in case 1, even when there was well-marked eosinophilia in the blood, were eosinophils seen in the C.S.F., in contradistinction to the case reported by Applebaum and Wexberg (1944) where a normal blood-count was associated with an eosinophilia in the C.S.F.

On the assumption that a single invasion had taken place and that the patient was not harbouring *Tænia solium* and so reinfecting himself, it may be that the tissues were simultaneously involved and that different cysts matured or overcame local resistance at different times. This in no way invalidates the statement in the *British Medical Journal* (1941) that "within one month of the ingestion of ova the parasites begin to develop in favourable sites and that within four months the embryo is fully formed within its cyst." This will explain the appearance of a cyst or cysts in the frontal lobe in January, 1944; another cyst in the lip in November, 1944; three subcutaneous cysts and generalised myositis in February, 1945; and crops of subcutaneous cysts at different times since. This further is in accord with the statements of MacArthur (1937) and Brailsford (1941) that there is a latent period of some years between the ingestion of the ova and the appearance of the nodules. It is also in harmony with Brailsford's belief that auto-infestation is rare, and that most cases are due to ingestion of ova. Moreover, since the worm grows to a normal length of 6–10 ft., it must be almost impossible for proglottides to regurgitate through that length of bowel, and auto-infestation, if it does occur, must occur comparatively early.

Apart from their intrinsic value these cases are of topical interest in that, with the return of so many men from India and the Far East, the incidence of cysticercosis will probably increase in this country.

SUMMARY

Two cases of generalised cysticercosis are described, where the outstanding feature was generalised pseudohypertrophy of muscles.

One patient was observed for 18 months, during which he developed an eosinophilia which coincided with the appearance of many viable cysts in the muscles.

It is suggested that in this case generalised muscular infestation occurred on one occasion only, the cysts developing in favourable sites first and in less favourable sites later.

I am indebted to Brigadier J. D. S. Cameron, C.B.E., for his encouragement to publish this paper: Colonel F. M. Lipscomb, O.B.E., for his criticism; Major L. Krainer for his reports on the sections and the C.S.F.; Major A. D. Leigh,

CYSTICERCOSIS RESEMBLING MYOPATHY

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THE two cases reported here present features which emphasise MacArthur's (1937) dictum that the different types of cysticercosis described are but isolated phases in the natural history of the disease.

CASE-RECORDS

Case 1.—A Sikh sapper, aged 25, who had been 2½ years in the Army at Poona, and, before that, 7 years huntsman to the Maharaja of Patiala, was admitted to hospital on Feb. 11, 1944, with 4 months' history of weakness, 2½ months' history of bilateral anterior temporal headache of equal intensity day and night but not interfering with sleep nor accompanied by vomiting or any visual or auditory change, and 2 days' history of fever and rigors.

The patient moaned often, gave his history with difficulty, and was uncoöperative. He was right-handed. The only abnormalities found were a palpable spleen, an extensor plantar reflex on both sides, impairment of the sense of position of the right great toe, and a right grasp reflex. Retinæ normal. The psychiatrist reported as follows: "He knows that there is a change in his mind. He says that he understands well enough, and that he knows what he wants to say, but he cannot get it out. His difficulty in speaking is obvious—slow, distinct, delayed. There is ideational retardation, and a tendency in his conversation to wander away from the subject, but he endeavours to return to it."

White-cell count 6800 per c.mm. (polymorphs 70%, lymphocytes 25%, eosinophils 3%, monocytes 2%). Urine: no abnormality. Stools: no ova or cysts. Blood Wassermann reaction and Kahn test negative. On March 25, 1944, lumbar puncture produced clear cerebrospinal fluid (C.S.F.) under normal pressure, containing 1 cell per c.mm., protein 30 mg. per 100 ml., chlorides 750 mg., sugar 150 mg., and urea 38 mg. Encephalogram and radiogram of skull normal.

April 11, 1944: pyrexia and rigor; no malaria parasites found in blood. April 12: white-cell count 8000 per c.mm. (polymorphs 72%, lymphocytes 20%, eosinophils 5%, monocytes 3%). After two months in hospital, all abnormal signs having disappeared and headache having much improved, patient went home on leave. It was felt at that stage that the former provisional diagnosis of a left frontal tumour could not be substantiated.

Readmission.—On Nov. 16, 1944, he was admitted to the psychiatric department, with the diagnosis of anxiety state. He was then complaining of generalised headache and swelling of the body. His face looked bloated; there was a left mastitis, and a small submucous tumour in the upper lip. Other cysts were sought for without result. The only abnormality was a persistent extensor plantar reflex on the right side. Blood-pressure 110/78. White-cell count 6400 per c.mm. (polymorphs 73%, lymphocytes 20%, eosinophils 5%, monocytes 2%). Lumbar puncture produced clear C.S.F. under normal tension, with 6 lymphocytes per c.mm., protein 50 mg. per 100 ml., sugar 45 mg., Wassermann reaction negative. Urine normal; no ova or cysts in stools. Psychiatrist's report: "A cavalier attitude. Emotionally very superficial and apathetic. Conversation tends to be stilted. Appreciable tendency to echo symptoms. Orientation and memory fair. ? visual hallucinations, but very haphazard in answers. No emotional change in his speech or actions. ? commencing behaviour disorder. No ideational disorder, but there is some retardation."

The patient's symptoms much improved and he was discharged on Jan. 7, 1945.

Third Admission.—He was admitted for the third time on Feb. 5, 1945, complaining of weakness and increasing girth of his calf muscles and a constant bilateral frontal headache, worse on the right side. His intelligence was normal, his memory was good, and he gave a connected story, but he was boisterous, childish, and addicted to cracking jokes, and he laughed often without apparent cause. He was the life and soul of the ward. He was docile and he assisted the nurses in their work; he knew the use of objects and could use them, but it was difficult to make him grasp what wa necessary. His appetite was now voracious. There wa apparent hypertrophy of all muscles of the body, a veritabl Hercules, the right calf was 15 in., and the left calf 15½ in in circumference. (The admitting officer had provisionall diagnosed pseudohypertrophic muscular dystrophy.) The was slight œdema over small of back and over the shins f their whole length. Small subcutaneous nodules, about t size of a pea, were found over the left scapula, mid-sternu and right forehead. The submucous tumour noticed in t upper lip in the previous November had disappeared. Fun and visual fields normal. Bilateral extensor plantar refle White-cell count 6600 per c.mm. (polymorphs 68%, lymph cytes 18%, eosinophils 10%, monocytes 4%). No ova cysts in stools.

Cysticercosis was provisionally diagnosed and confirm by examination of an excised cyst.

C.S.F.: *pressure normal* (145 mm.), 20 lymphocytes p c.mm., protein 55 mg. per 100 ml., globulin (Nonne-Appel increased, Lange 4332000000, Wassermann reaction negativ Blood-cholesterol 150 mg. per 100 c.cm., blood-urea 32 m Radiography of a thigh and the skull showed no calcif foci or other abnormality; sella and clinoid processes norm Treatment with *Filix mas* on two occasions had not produc any tapeworm in stools; and stools were negative for o in repeated examinations over nearly a year.

Course of Illness.—Feb. 17, 1945 . generalised epileptifor fit; no incontinence of urine or tongue-biting, but furth details not available. No further fit occurred until 8 mont later. March 24: many more cysts palpable, and ma seen, in forehead, right cheek, tongue, right anterior cervi region, left suprascapular fossa, left antecubital fossa, anter and lateral aspects of chest, left infrascapular area, and l lower quadrant of abdomen. All but one of the cysts abo horizontal nipple line could be palpated. April 30: m cysts appeared about neck. May 15: C.S.F. contain 18 cells per c.mm. (lymphocytes 88%, polymorphs 12% protein 70 mg. per 100 ml. Pandy test +, and Nonne-App test negative. May 19: White-cell count 6200 p c.mm. (polymorphs 61%, lymphocytes 27%, eosinophils 9 monocytes 3%). June 7: white-cell count 6400 p c.mm. (polymorphs 63%, lymphocytes 25%, eosinoph 10%, monocytes 2%). June 11: radiography of calf showed fine diffuse mottling throughout soft tissues but calcification.

June 17, 1945: right plantar reflex still extensor; rig *abdominal reflexes less brisk than those on the left.* Ment condition had gradually improved. Patient had headache, relieved by recumbency and not worse on lean forward. He still complained of tightness of calf muscle whose circumference and overlying œdema were unchange He was quiet and had lost his boisterousness. He was mo helpful than ever in the ward. Memory for recent and pa events good. He was suffering from insomnia, sleepi only from 5 to 8 A.M. and sometimes during the da Emotions apparently normal; no hallucinations or delusion No defects in articulation; no aphasic signs, spoken an written speech being normal. No phenomena associate with aphasia, such as amimia, the inability to understa symbols or to recognise common objects; no apraxia. Cys more numerous than before; two excised on May 18 were st viable.

Sept. 13: headache and tightness in calves and pector muscles only slight. Patient alert and intelligence norma Girth of all muscles unchanged; slight œdema still prese over shins. Liver and spleen just palpable. Blood-pressu 96/66. Cysts unchanged in number and consistency. Plant reflex still extensor; right abdominal reflexes diminished.

White-cell count 6400 per c.mm. (polymorphs 67% lymphocytes 24%, eosinophils 7%, monocytes 2%). Urin normal. Erythrocyte-sedimentation rate 35 mm. in 1 hour Patient was pitifully weak and tired easily.

In October and in November an epileptiform fit wa witnessed. In December, his condition unchanged, the patien left on pension for his home in the Punjab.

Case 2.—A Hindu sweeper, aged 20, complained of year's weakness and swelling of the legs. A year previousl while on a long ride, he had been overcome with weakne and fever, and on his return had lain ten days prostrate with fever and limb pains. He then returned to work but in the subsequent 12 months he noticed that his calve were increasing in size (see figure) and his legs becoming a direct lethal action on them. Similarly, the ilariæ remain actively motile for more than 48 hours at 37°C in the presence of serum from rats treated with doses of hetrazan 1½–2 hours before bleeding. So ems that hetrazan is not converted in the body some other substance which is actively micro- icidal. This conclusion is further supported by the rvation that intrapleural injection of hetrazan does have any striking action on the microfilariæ in the ral cavity.

Further studies were made by examining the distri- ion of microfilariæ in the different organs. Sections e made by the usual histological methods, and the ber of microfilariæ per unit area was determined counting under the microscope. In a typical experi- t a piece of liver was removed under anæsthesia a rat whose blood contained 470 microfilariæ per c.mm.; the section of liver contained 44 microfilariæ 100 sq. mm. Hetrazan (25 mg. per 100 g.) was then ed intraperitoneally, and an hour later the rat killed. The number of microfilariæ in the peripheral had fallen to 85 per 10 c.mm., and the number ctions of the liver had risen to 193 per 100 sq. mm. rats killed within an hour of treatment with hetrazan microfilariæ lay between the liver cells, presumably collapsed sinusoids. In rats killed 6 hours after ment many of the microfilariæ were surrounded by ytes, which seemed to be attacking them. In of the other tissues the microfilarial content was , relative to the initial blood-count, in treated rats in untreated controls. The lungs form a special in cotton-rat filariasis since they are the chief of entry for the microfilariæ from the extravascular (pleural cavities) into the circulation, and their nt of microfilariæ is correspondingly high.

is concluded from all the above-mentioned observa- that hetrazan acts by modifying the microfilariæ e way so that they are seized by the phagocytes reticulo-endothelial system and presumably d; thus its action would resemble that of . Microfilariæ which are removed from contact hagocytes—e.g., in vitro, or in the pleural cavity— speedily affected by hetrazan.

chemical and/or physical reactions underlying "opsonising" effect of hetrazan are unknown. the effect is produced so quickly, they must be . Attempts were made to antagonise the action of n by previous administration to the cotton-rats stances such as nicotinamide, nikethamide, &c., have a somewhat similar chemical structure. In cases the disappearance of microfilariæ caused by an was less complete than usual, suggesting slight nism; but convincing antagonism was not strated. This work will be continued, but various stances will prevent its completion and full ation in the next twelve months.

SUMMARY

action of hetrazan (1-diethylcarbamyl-4-methyl zine hydrochloride) on cotton-rat filariasis due to *oides carinii* has been studied.

compound acts on the microfilariæ more than on dult worms.

compound and its metabolic products do not have ct lethal action on the microfilariæ, but they seem dify them in some way (opsonise them) so that are seized by phagocytes of the tissues and removed the circulation.

ful acknowledgments are due to Mr. D. Garlick and R. Jones for technical assistance.

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Reviews of Books

Living Anatomy

R. D. LOCKHART, M.D., CH.M., regius professor of anatomy, University of Aberdeen. London: Faber. 1948. Pp. 71. 12*s*. 6*d*.

THIS is an atlas of 149 photographs demonstrating surface contours and the actions of muscles in the living (particularly the male) subject. The purpose of these excellent illustrations is to promote enthusiasm for the examination of muscles in action in the living body. Several photographs are added at the end of the book, affording comparisons between virgin and lactating breasts, and the male and female forms: 6 photographs are also devoted to the surface anatomy of the eye, and 5 to the superficial veins of the forearm. Since at most anatomy schools a knowledge of muscle action is only a part of the knowledge of surface anatomy required of the medical student, this book may perhaps not have much appeal to him; the surface relations of the major arteries and nerves, for example, might be thought of greater importance for the future general practitioner. The atlas should, however, be of considerable use to occupational therapists, masseurs, and teachers of physical training, and also to artists. Since the late Arthur Thomson's *Handbook of Anatomy for Art Students*, now lamentably out of date (although still reprinted), little or no attempt has been made in this country to present surface anatomy to the artist by means of the photography of well-selected models. Here, in Professor Lockhart's atlas, is a series of photographs well suited to this purpose.

Blood Derivatives and Substitutes

C. S. WHITE, M.D., SC.D., formerly professor of surgery, George Washington University; J. J. WEINSTEIN, M.D., associate in surgery at the university. Baltimore: Williams and Wilkins Company. London: Baillière. 1947. Pp. 484. 41*s*.

THE authors say that their book is written "for the purpose of presenting a comprehensive study of plasma, plasma substitutes and by-products from a clinical standpoint," and "the chief emphasis has been placed on the practical and clinical aspects of the various subjects covered, so that it may serve as a reference and guide equally for the surgeon, the internist, pathologist, general practitioner, and student"—a fairly comprehensive field of readers. After a brief survey of the history of transfusion, a chapter describes the physiology and chemistry of the plasma, including a cursory discussion of the blood-groups. Between two-thirds and three-quarters of this chapter are taken up by the details of technical methods for counting blood-cells, the micro-Kjeldahl technique, and the like. The preparation of liquid citrated plasma (assisted by Dr. J. Reichel), the storage of plasma, the preparation, storage, and use of dried plasma (by Dr. E. L. Lozner), and the administration of plasma are then described. Chapters follow on plasma fractionation (by Dr. S. T. Gibson), by-products of plasma preparation, plasma substitutes, human blood-serum, blood preservation, the blood bank (by Dr. R. B. H. Gradwohl), shock, clinical results with human plasma, and reactions with plasma.

The book is of value for two reasons: it is largely an account of the personal experience of the authors in the Gallinger Municipal Hospital, Washington, where a blood-plasma bank has been maintained since 1937, and it presents a general review of work (mainly American) on blood derivatives and substitutes during the war years. It is, however, unequal in its treatment of the various subjects. It seems a pity that a book nominally concerned with blood substitutes does not contain a more complete account of the work done on them: they are dismissed in 28 pages, and no mention is made, for example, of 'Periston,' or the Swedish work on 'Dextran.' Homologous serum jaundice, which must be considered one of the risks of using plasma, is discussed in less than a page, reference being made to only four papers, none of them later than 1944, while the chapter on plasma fractionation and fractions concerns itself almost exclusively with albumin. On the other hand, space has been given to subjects which might well have for the notes and photograph of case 2; and the D.M.S., India Command, for permission to publish.

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RECURRENCE OF DUODENAL ULCER SIX MONTHS AFTER ADEQUATE VAGOTOMY

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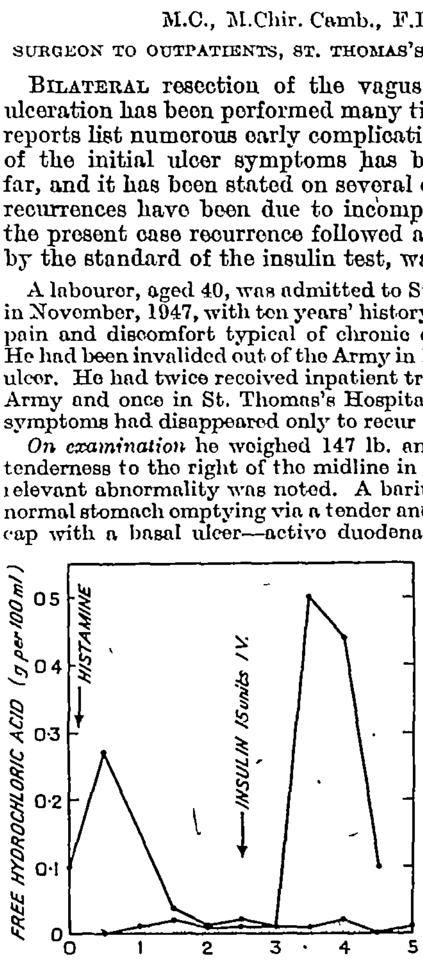
BILATERAL resection of the vagus nerves for peptic ulceration has been performed many times. All published reports list numerous early complications, but recurrence of the initial ulcer symptoms has been uncommon so far, and it has been stated on several occasions that such recurrences have been due to incomplete operation. In the present case recurrence followed an operation which, by the standard of the insulin test, was adequate.

A labourer, aged 40, was admitted to St. Thomas's Hospital in November, 1947, with ten years' history of upper abdominal pain and discomfort typical of chronic duodenal ulceration. He had been invalided out of the Army in 1944 with a duodenal ulcer. He had twice received inpatient treatment, once in the Army and once in St. Thomas's Hospital, but each time his symptoms had disappeared only to recur soon after discharge.

On examination he weighed 147 lb. and, apart from some tenderness to the right of the midline in the epigastrium, no relevant abnormality was noted. A barium meal showed "a normal stomach emptying via a tender and deformed duodenal cap with a basal ulcer—active duodenal ulceration." The gastric acidity after histamine followed by 15 units of insulin is shown in the accompanying figure.



Gastric acidity before and after vagal resection: upper curve, before resection (blood-sugar 52 mg. per 100 ml.); lower curve, twelve days after resection (blood-sugar 48 mg. per 100 ml.). The response six months later, when symptoms had recurred, was no free hydrochloric acid, combined hydrochloric acid 0·03 g. per 100 ml. as highest level after insulin 15 units I.V., and blood-sugar 34 mg. per 100 ml.

Operation.—On Nov. 7, 1947, a resection of the vagus nerves by the transhiatal route was performed, and an active ulcer was noted on the anterior wall of the first part of a scarred and deformed duodenum. There was stenosis.

The postoperative course was uneventful, and the patient was symptom-free and very satisfied on his discharge fourteen days later. A postoperative insulin test was performed before he left hospital and the vagus-nerve resection appeared by this standard to be adequate (see figure).

Recurrence.—The patient remained very satisfied for six months; he gained 6 lb. in weight and even recommended the operation to two of his friends. In May, 1948, however, he reported with a complete recurrence of his symptoms and was of the opinion that his ulcer had recurred because he fel just the same as he had before the operation. A barium me now showed "a normal orthotonic stomach emptying via tender and deformed duodenal cap—appearance of activit in a duodenal ulcer." In view of this report a third insuli test was performed. There was no free hydrochloric aci and only a slight trace (0·5%) of combined acid was presen The blood-sugar level fell to 34 mg. per 100 ml.

COMMENT

By the standard of the insulin test this patient had a adequate resection of the vagal nerve-supply to h stomach, and there is no evidence of regeneration. I spite of this his ulcer symptoms have recurred after s months' complete postoperative freedom.

The barium meal, though not demonstrating a defini ulcer, now shows the appearance of activity in a tend duodenum, and the insulin test performed after t recurrence of symptoms produced no free hydrochlo acid and only a small amount of combined acid.

At St. Thomas's Hospital vagus-nerve resection h been performed on 37 patients for peptic ulcer. The ea results in 5 patients with secondary ulceration followi gastrectomy or gastro-enterostomy have been very go In the other 32 patients with duodenal ulcer numero initial complications have been noted, including te porary severe dysphagia (4 patients); persistent di rhœa (2 patients); and eructations of foul gas (1 patient but in no other patients have the ulcer sympto recurred, though in 4 the operation was by the standa of the insulin test incomplete.

Preliminary Communication

MODE OF ACTION OF HETRAZAN IN FILARIASIS

'HETRAZAN' (1-diethylcarbamyl-4-methyl piperaz hydrochloride) is a new compound which has recen been introduced for the treatment of human filaria due to *Wuchereria bancrofti*.[1] We report here an inve gation carried out on cotton-rat filariasis to study mode of action.

The cotton-rats used for this work were infected our laboratory with *Litomosoides carinii*. In this infe tion the adult worms lie in the pleural cavities and t microfilariæ, which are sheathed and non-periodic, flo in the circulating blood. When the infected cotton-ra are treated with hetrazan in doses of 25 mg. per 100 of body-weight intraperitoneally, the microfilariæ in t peripheral blood become much fewer.[2]

When 6 mg. per 100 g. is injected intravenously in cotton-rats, the diminution is extremely rapid, 80 of the microfilariæ disappearing in 1 min., and ov 90% in 2 min. But even after fairly intensive treatme a few microfilariæ still persist in the circulating bloo Similarly, the pleural cavities still contain many moti and apparently healthy microfilariæ around the adu worms. It seems that these microfilariæ in the pleur cavities form a reservoir from which the supply in t blood is constantly replenished. Hetrazan has only moderate effect on the adult worms, and our experien confirms the report of Hewitt et al.[2] that prolong intensive treatment is needed to destroy them: eve this sometimes does not kill all the worms.

Microfilariæ of *L. carinii* can be maintained alive f several days at 37°C in a suitable medium—e.g., seru plus Ringer's solution plus glucose. When hetrazan added to the medium in concentrations up to 100 mg per 100 ml., the microfilariæ remain actively motile f more than 48 hours, indicating that hetrazan does no

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1. Santiago-Stevenson, D., Oliver-González, J., Hewitt, R. I *J. Amer. med. Ass.* 1947, **135**, 708.
2. Hewitt, R. I., Kushner, S., Stewart, H., White, F., Wallace, W Subbarow, Y. *J. Lab. clin. Med.* 1947, **32**, 1311.

THE LANCET

LONDON: SATURDAY, NOV. 6, 1948

Streptomycin in Pulmonary Tuberculosis

Two years ago the Medical Research Council appointed a committee, with Dr. GEOFFREY MARSHALL as chairman, to plan clinical trials of streptomycin in tuberculosis. The committee's first major report, on tuberculous meningitis,[1] confirmed the American experience that in most cases streptomycin would prolong life, that in many it would produce considerable improvement, and that in a few clinical cure was possible—a great advance over the previous hopelessness. The committee's second report,[2] on pulmonary tuberculosis, is also favourable within limits; but whereas the meningitis trials embraced every variety of case, save those in extremis, the pulmonary series was restricted to one category. This category—acute progressive bilateral tuberculosis of recent development in young adults—is peculiarly unsuitable for collapse therapy, but, judging from animal experiments, it is one in which the antibiotic might be expected to have some action. Bearing in mind the shortage of supplies, it was fully justifiable to treat half the patients (S) with streptomycin plus bed-rest and the other half (C) in the ordinary way, by bed-rest alone. The method adopted in assigning patients to streptomycin and control groups, and the precautions taken against bias in the selection of patients, in treatment, and in the analysis of results, have brought this controlled study as near to a laboratory experiment as is practicable and make it unique in the dismal history of tuberculosis chemotherapeutic trials. The 55 S patients received 2 g. of streptomycin daily intramuscularly for four to six months (mostly for four). At the end of six months 4 S patients and 14 of the 52 controls had died, whereas 28 S patients and 4 C patients had considerably improved. Improvement was assessed by X-ray films—viewed independently by two radiologists and a clinician—clinical picture, and tendency to sputum-conversion. The radiological improvement consisted mainly of a clearing of "exudative" lesions; large cavities did not close. In general the results are definite and striking, the comparison with the control group permitting of a critical assessment capable of statistical test. It is not so much a question of "cure"—none of the treated patients could be said to be clinically cured after six months' or even a year's observation, and no more than 15% had become bacteriologically negative—as of setting the patient on the road to recovery with the aid of his own resistance, or of making the lung condition suitable for collapse measures.

The main value of the trial was to give an unequivocal affirmative to the question: Is streptomycin good in pulmonary tuberculosis? Since the subacute or acute type of disease investigated is uncommon, the direct application of the favourable conclusion is limited. But since the outstanding effect of the antibiotic was to check or cause regression in "infiltrative," "exudative," or "pneumonic" changes in the lung, benefit would be expected in other forms of pulmonary tuberculosis in which such lesions predominate. Thus we can now begin to define the types of pulmonary tuberculosis in which streptomycin can assist the conventional forms of treatment. Two things must be kept in mind. First, though toxicity did not necessitate the cessation of treatment in any case, vestibular damage was frequent (as has been the experience of others); and uncompensated vestibular damage may make a person incapable of driving a car or of walking steadily in the dark. So serious is the prognosis of the category investigated that nobody would hesitate to use the drug on account of this risk (the same is true in meningitis), but the position is different in the types of tuberculosis where the outlook is good without streptomycin. Secondly, the well-known tendency of streptomycin-resistant tubercle bacilli to emerge in the course of treatment was experienced in this trial and may account for the flattening out of the curve of improvement in many cases: improvement was nearly always greatest in the first month or so. Since no recent variation of the scheme of dosage or rhythm of administration of streptomycin has done more than postpone the appearance of drug-resistance, this dialectical phenomenon of nature is with us till further notice. This means that the physician must plan his long-term campaign of treatment on the assumption that probably only one effective course of streptomycin can be given; and if streptomycin is given during a phase of the disease in which good progress would be expected with ordinary management, a critical phase occurring later might find the weapon useless. We can roughly define the field of streptomycin therapy in pulmonary tuberculosis as cases in which the lesions requiring treatment are of recent development, progressive, and unlikely to benefit from ordinary treatment (e.g., bed-rest or collapse measures) alone. This definition would include rapidly advancing disease where pneumothorax is contra-indicated, and acute "spreads"—e.g., after artificial pneumothorax or thoracoplasty (no evidence has yet been produced to show the value of streptomycin in *preventing* spreads after ordinary thoracoplasties); lesions too "hot" for immediate pneumothorax treatment might be made suitable by a course of streptomycin. The definition will exclude old chronic fibroid, or fibrocaseous lesions, or long-standing cavitation—i.e., the commonest type of chronic phthisis. It will exclude terminal conditions, and also minimal early lesions with favourable prognosis. The main reason for excluding the "good chronic" and terminal conditions is that little benefit can be expected, and that a focus of dissemination of streptomycin-resistant bacilli will probably be created. On the other hand, the minimal or early lesion is very likely to benefit, at least temporarily; but this chance has to be balanced against the risks of streptomycin-resistance spoiling the patient's chances in a later recrudescence, and of the occurrence of permanent vestibular symptoms.

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[1] *Lancet*, 1948, i, 582.
[2] *Brit. med. J.* Oct. 30, p. 769.

been omitted, or treated more briefly. The dilemma which seems to have faced the authors was how to write a book on blood derivatives and substitutes without covering, more or less completely, the whole field of transfusion.

Though not received for review until the middle of 1948, it was published in the United States in 1947. Hence the reader who expects to find references to work later than 1946 will be disappointed.

Education and Health

R. GAMLIN, M.A., M.B. Camb., chief assistant school medical officer, Liverpool. London: J. Nisbet. 1948. Pp. 372. 12*s.* 6*d.*

IT has long been recognised that teachers in training deserve good teaching in the bases of health. This book provides them with a sound complement to the standard works on school hygiene. There are excellent chapters on intelligent thinking, backwardness, scientific estimation of hearing, and immunity. Burt's finding that girls given periods of rest showed greater improvement in arithmetic than those given coaching is instructive; and so is an experiment from Georgia where 18 children picked as likely to fail in their examinations were given complete dental treatment—with the sequel that at the next examination, 17 passed in every subject. In the next edition Dr. Gamlin might mention Bowlby's work on the origin of delinquency, and bring the chapter on dietetics up to date with an account of rationing. The suggestion, recorded as "novel," that children should be taught by "participatory" rather than "rivalry" methods deserves to have as a footnote Dr. Johnson's remark: "By exciting emulation and comparisons of superiority, you lay the foundations of lasting mischief; you make brothers and sisters hate each other."

This book could usefully be read by candidates for the D.C.H.

Oxford Essays on Psychology

WILLIAM BROWN, D.M., D.SC., F.R.C.P., formerly Wilde reader in mental philosophy and director of the Institute of Experimental Psychology, University of Oxford. London: Heinemann Medical Books. 1948. Pp. 148. 10*s.* 6*d.*

IN these lectures to students Dr. William Brown seems to be restraining himself. From time to time, by a particular turn of phrase or concept, the fact that he has made a contribution to psychiatry becomes suddenly evident to the attentive reader. More often, unfortunately, the effect is of an academist presenting his subject to the young. Dr. Brown is too serious and brilliant a student of philosophy, psychology, and human nature to say things that should not be said; moreover, the impression he gives that he is not saying anything new is not entirely true. He is certainly presenting his own standpoint, and it bears the stamp of insight, erudition, and individuality. His views on Nazi Germany, the paranoid tendency, and mental relaxation all strike a note of truth, but the reader seeks in vain for a sense of the immediacy of that truth. Dr. Brown's truth is apposite; it is not insistent.

Le foie vasculaire: angiosclérose hépatique

MAURICE FAVRE, professeur à la Faculté de Médecine de Lyon. Paris: Masson. 1948. Pp. 99. Frs. 220.

THIS monograph is devoted to the morbid anatomy of a peculiar form of hepatic fibrosis of which 50 cases have been studied by the author. The condition is readily distinguishable from Laennec cirrhosis in that the fibrosis is confined to the portal tracts and does not invade the hepatic lobules. No single ætiological agent is held responsible, but the condition is regarded as a standard type of response of the portal connective tissue to injury mediated via the blood-vascular system. The evidence on which this theory is based is tenuous and leads to the remarkable conclusion that the portal fibrosis in congestive cardiac failure is not the result of the failure but is to be attributed to the same factors as are responsible for the cardiac lesions themselves. The anatomical account of the condition is presented in great detail with many clear illustrations. The tissue lesion is remarkable, and it is surprising that it has been overlooked for so long. This may be explained part however, by the absence in uncomplicated cases of a symptoms or signs referable to the liver itself. Desp its disappointing discussion on the ætiology, the bo is an extremely interesting account of vascular disc of the liver, a subject hitherto much neglected.

Black's Medical Dictionary (10th ed. London: A. & Black. 1948. Pp. 995. 25*s.*).—The present edition of the l Dr. J. D. Comrie's justifiably popular work, first published 1906, has been revised by Dr. W. A. R. Thomson. It is mu more than a dictionary, in that it gives not only definitic but also varieties, causes, and treatments of diseases; d cusses the disposal of the dead and of refuse and sewag shows the reader how to change the sheets in a bed occup by a patient; and contains much other practical informati There are over 500 illustrations in the text and 6 full p plates, of which 4 are coloured.

Modern Treatment Year Book 1948 (London: T *Medical Press.* 1948. Pp. 338. 15*s.*).—Once again Cecil Wakeley has cast his net wide in his laudable atte to provide the general practitioner with a concise pract account of modern methods of treatment. The 38 arti in the present volume cover most of the commoner (and sc of the rarer) conditions encountered in practice. It is to hoped perhaps that practitioners will not follow the advice the chapter on pernicious anæmia, not to worry abou complete hæmatological examination in a case of "suspec anæmia" until a few weeks' treatment with iron has fa to produce any improvement; and the chapter on asthm children suffers from a lack of discrimination. On the wh however, this is a book which the busy general practiti will find of value.

Oxidation-Reduction Potentials in Bacteriol and Biochemistry (5th ed. London: Staples Press for *Hospitals and Medical Services Committee of the Lon* County Council. 1948. Pp. 130. 4*s.* 6*d.*).—Since its publication in 1931 this concise book by Mr. L. F. He PH.D., has been in constant demand, as indeed it deserve be, for it is a plain straightforward account which cont not to sacrifice accuracy to simplicity. The war has responsible for a delay of nearly twelve years since the edition, and consequently much new work is summ here; thus there is a short but useful chapter on polarog and a brief description of potentiometric work with a biotics and chemotherapeutic agents. Even in its p cover, this book provides a welcome example of val money.

Endocrine Therapy in General Practice (6th ed. Chic Year Book Publishers. London: H. K. Lewis. 1948. Pp 23*s.* 6*d.*).—Dr. E. L. Sevringhaus gives us a short, sim readable book. Descriptions of the endocrine syndrome brief, but on the whole clear and up to date, with mention of latest diagnostic tests. The author is rather optimistic ab the efficacy of pituitary extracts, especially the growth fac and to a lesser degree the gonadotrophins. It is refreshin find that he devotes a fifth of the book to the therapeu of diabetes mellitus, which is as yet scarcely regardc an endocrine problem in this country. He is conservativ his estimate of the rôle of thiouracil in the treatmen thyrotoxicosis, and perhaps a little old-fashioned in recommendations about deep X-ray therapy to the thy gland. Under the heading of the mammary glands, no men is made of the use of iodinated proteins to stimulate lactat In a good chapter on the adrenals the complex interrelat of Cushing's syndrome and adrenocortical over-activity rather summarily dismissed. Gynæcological endocrinol receives too little consideration: such recent therape successes as the control of excessive bleeding with œstrog and progesterone are not mentioned, and Dr. Sevringh deprecates the use of androgens, ignoring their spectac anabolic effects in the treatment of Simmonds's disease eunuchoidism. He lays due emphasis on dietary restricti in the treatment of obesity and provides useful tables show how to plan 1200-calorie diets. The photographs are excell and depict many typical examples of endocrine disord References to commercial therapeutic products are based the American market and may therefore be confusing to English reader, but the book is a well-balanced exposition modern endocrine therapy.

When it is realised that about half of all healthy ults harbour coagulase-positive staphylococci in eir nose, and that upwards of 20% are hand carriers. ere is no need to stress the importance of widening field of investigation of the epidemiology of phylococcal infections. The squamous epithelium the nasal vestibule is considered to be the focus of nisation[9] of *Staph. pyogenes*, and HOBBS and her eagues[10] have shown that in sycosis barbæ the ecting type of staphylococcus is regularly present the nose, where it will provide an autogenous rce of reinfection unless the nasal passages are ated at the same time as the lesions. On p. 727 RRISON records a familial outbreak of staphylococcal ections in which 2 of a family of 7 children developed ute suppurative arthritis, and a third acute osteo-elitis, all within three months. The same phage pe of staphylococcus was isolated from the lesions all 3, and also from the nose of a brother recently overed from impetigo and from the nose of a sister th no history of acute infection. This is a striking ample of the epidemic potentialities of staphylococcal infections in the home, and it makes one wonder ether multiple staphylococcal infections of the n in a household may not also be due to the spread a single strain of staphylococcus from person to son. In his daily round the doctor often sees a e of impetigo associated with an earlier or sub-uent case of skin infection in one or more members the family; this may take the form of another e of impetigo, or of boils, styes, acneform pustules, fingers, or even sycosis barbæ. The infectivity contagious nature of staphylococcal infections e skin are probably not generally realised, and el—in particular the roller towel—and other of toilet used in common by all the house- probably play an important part in their d.

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The New Zealand Experiment

TEN years after the passing of the Social Security Act, the government and the profession in New Zealand agree that public medical care under the Act requires review, or (as a correspondent on p. 743 puts it) needs a spring-clean. The report lately produced by a joint committee representing the department of health and the British Medical Association reveals shortcomings and suggests some remedies.

Pride of place is given to the general-practitioner service, on which the emphasis has always been placed in developing the system. One of the interesting features of this service is that although the Act allows payment by capitation fee or by salary, nearly all practitioners outside Maori settlements and other under-privileged areas have chosen to be paid on an item-of-service basis, the fee for each item being claimed from the government either by the doctor himself (direct payment) or by the patient (refund system). Each item of service, whether rendered at the doctor's surgery, in the patient's home, or at a private hospital, commands the same fee (7*s.* 6*d.*); but most practitioners have been in the habit of charging additional fees to patients who seemed able to afford them. Obviously, when it can draw on an unlimited State fund this system is open to abuse: the report speaks of "cases where general practitioners were receiving annual sums much in excess of what could be regarded as reasonable and proper remuneration," and it says that "the present invariable practice of obtaining a certificate from the patient, parent, or guardian as to the dates, &c., of attendance has only limited value." Yet, in spite of these shortcomings, the fee-for-service has become so much a part of the New Zealand way of life that the committee does not seriously contemplate any alternative. Of payment by capitation it remarks that "under the existing circumstances in this country a renewed attempt to introduce such a system generally could not succeed," and that capitation "tends to a decline in the high standard of practice." Oddly enough, the few doctors who accept patients under the capitation scheme mostly operate the fee-for-service too. In the absence of safeguards (and none are mentioned) this seems to offer the unscrupulous the best of both worlds—the good lives contributing their regular capitation income, the bad ones the fees for service. The committee understandably recommends that practitioners should not be allowed to practise under both systems at the same time, but should be obliged to choose between them.

Having dismissed salaries and capitation, the committee considers how fee-for-service remuneration can be reformed and simplified. It proposes to abolish the refund system, and require the practitioner to make all the claims for his payment. But to salve the conscience of those who object to being paid directly by the State—lest this destroy their professional freedom and the doctor-patient relationship —a form of words has been devised to make it clear that the doctor is claiming the moneys not on his own behalf but "on behalf of the patients listed in column (3)." So into column 3 of the claim form must go the names of all the patients (or their legal

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Moss, M., Squire, J. R., Topley, E. *Lancet*, 1948, i, 320.
Hobbs, B. C., Carruthers, H. L., Gough, J. *Ibid.* 1947, ii, 572.
Whitwell, G. P. B., Sutherland, I. *Brit. J. industr. Med* 1948, 5, 88.

In the U.S.A. the new hopes for the tuberculous which were based on the first trials in that country, assisted by uncontrolled commercial enterprise and an ever-increasing supply (including eventually sales over the counters of drug stores even without prescription), led to a situation where almost every hospital patient with money, and about 50% of all inpatients, were given the drug at some time—whereas more cautious American physicians estimate that it is medically indicated in about 10%. Indeed it is said in the U.S.A. that if your railway dining-car attendant is unsteady and spills the soup down you, tuberculosis should be suspected! Here a more cautious attitude, together with the dollar shortage, has caused the Government to advance warily. During 1947 and 1948 enough streptomycin was imported for M.R.C. trials, later for official release to hospitals for meningeal or miliary tuberculosis, and still later for ulcerative tuberculosis of the larynx, trachea, and bronchi. Apart from the swelling trickle of individual purchases of American streptomycin, officially tolerated as a safety-valve but of rather doubtful morality, the antibiotic has been unobtainable in this country for pulmonary tuberculosis. Now that home-production has increased substantially, we may expect a wider, though still limited, release from Government internal purchases. Will the wave of indiscriminate use follow the American pattern, or can it be modified by self-discipline? Much will depend on the persuasive guidance given to the doctors entrusted with the drug. It may be wisest to confine distribution to tuberculosis officers and other specialists, with access to laboratory, X-ray, and preferably also hospital facilities; for lack of appreciation of the toxic effects of the drug, failure to test cultures for susceptibility at the beginning, during, and at the end of treatment, and failure to watch progress by X ray under standard conditions, may do harm to the patient besides wasting a valuable drug. No doubt there will be temptation to use streptomycin to treat an early lesion, so as to get the patient back to work quickly; to use it instead of collapse therapy or even bed-rest; and to treat hopeless cases to please relatives. But in the vast majority of cases the physician will have a free hand; he can weigh the advantages and disadvantages of streptomycin and act accordingly. Used with discrimination this remarkable new weapon can successfully supplement the proved methods of attack on a small though important sector of the tuberculosis front. The National Health Service can play its part by seeing that the drug is available at the right place and at the right time.

Epidemiology of Staphylococcal Infections

If measures of preventing and controlling epidemics are to be logically and successfully applied, the sources and paths of spread of epidemic infection must be exactly known. Such knowledge can only be gained when the infecting organism can be accurately defined and identified. Epidemiological studies of the acute streptococcal infections during the last twenty years have given us a valuable body of new information and are an outstanding example of the incentive to research arising from the definition of serological types within a bacterial species. This has only become possible as a result of the differentiation of some thirty serological types of *Streptococcus pyogenes* by the late FREDERICK GRIFFITH. Another example is the phage typing of *Salmonella typhi*, described by CRAIGIE and YEN, which is now being used every day to trace the sources of epidemics and cases of typhoid. More recently the serological differentiation[1] of types among *Staphylococcus pyogenes* and the development of phage typing[2] of that organism have brought the epidemiology of staphylococcal infections into the limelight. An organism so ubiquitous as the staphylococcus does not readily lend itself to epidemiological studies, but the field has been somewhat narrowed by the recognition that coagulase-production will differentiate pathogenic or potentially pathogenic strains from the rest. Type differentiation by serological and phage methods has therefore been applied only to coagulase-positive strains.

The main application of typing to the study of staphylococcal epidemics has been in institutional outbreaks of pemphigus neonatorum. In one outbrea involving 22 infants, ELLIOTT and others[3] conclude that a nurse who was a nasal carrier of the epidem strain had been the source and means of sprea of infection. ALLISON and HOBBS[4] described thr successive outbreaks of pemphigus neonatorum an staphylococcal conjunctivitis involving 132 infan in a large maternity unit, and demonstrated the wid spread occurrence of the epidemic strains in t infants' environment; their evidence pointed to t nurses as the source of infection, with the nas passages as its main reservoir and the hands the probable vehicle of spread. By phage typi ROUNTREE[5] was able to prove cross-infection wi pathogenic staphylococci in 18 out of 82 surgic wounds in a 24-bed surgical ward over a period seventeen weeks. In a study of penicillin-resista strains of staphylococci causing infections in a hospit unit, BARBER[6] showed that of 7 strains isolated fro patients during a single month, 5 penicillin-resista strains all belonged to the same phage and serologi type while 2 penicillin-sensitive strains belonged to different type, and she attributed the infections spread from patient to patient. Similarly in outbrea of staphylococcal food-poisoning due to enterotoxi typing of strains of staphylococci isolated from t suspected foodstuff, from the vomit or stools victims, and from the nose and hands or septic sk lesions of food-handlers has added to our knowled of the sources and modes of infection. Among t many outbreaks successfully traced to their sourc may be mentioned those described by WILLIAMS et al. in which infection of ice-cream was traced to the no and hands of one of the people who prepared i and by ODDY and CLEGG,[8] who showed that an ou break involving 167 miners who had eaten infecte pressed-beef sandwiches was caused by staphyloco isolated from the nose and hands of the butcher wh prepared the pressed beef.

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1. Cowan, S. T. *J. Path. Bact.*, 1939, 48, 169. Christie, R Keogh, E. V. *Ibid*, 1940, 51, 189. Hobbs, B. C. *J. Hy Camb.* 1948, 46, 222.
2. Fisk, R. T. *J. infect. Dis.* 1942, 71, 153, 161. Wilson, G. S Atkinson, J. D. *Lancet*, 1945, i, 647.
3. Elliott, S. D., Gillespie, E. H., Holland, E. *Ibid*, 1941, i, 16
4. Allison, V. D., Hobbs, B.C. *Brit. med. J.* 1947, ii, 1.
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6. Barber, M. *Brit. med. J.* 1947, ii, 863.
7. Williams, G. C., Swift, S., Vollum, R. L., Wilson, G. S. *Mo Bull. Min. Hlth E.P.H.L.S.* 1946, 5, 17.
8. Oddy, J. G., Clegg, H. W. *Brit. med. J.* 1947, i, 442.

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The New Zealand Experiment

TEN years after the passing of the Social Security Act, the government and the profession in New Zealand agree that public medical care under the Act requires review, or (as a correspondent on p. 743 puts it) needs a spring-clean. The report lately produced by a joint committee representing the department of health and the British Medical Association reveals shortcomings and suggests some remedies.

Pride of place is given to the general-practitioner service, on which the emphasis has always been placed in developing the system. One of the interesting features of this service is that although the Act allows payment by capitation fee or by salary, nearly all practitioners outside Maori settlements and other under-privileged areas have chosen to be paid on an item-of-service basis, the fee for each item being claimed from the government either by the doctor himself (direct payment) or by the patient (refund system). Each item of service, whether rendered at the doctor's surgery, in the patient's home, or at a private hospital, commands the same fee (7*s.* 6*d.*); but most practitioners have been in the habit of charging additional fees to patients who seemed able to afford them. Obviously, when it can draw on an unlimited State fund this system is open to abuse: the report speaks of "cases where general practitioners were receiving annual sums much in excess of what could be regarded as reasonable and proper remuneration," and it says that "the present invariable practice of obtaining a certificate from the patient, parent, or guardian as to the dates, &c., of attendance has only limited value." Yet, in spite of these shortcomings, the fee-for-service has become so much a part of the New Zealand way of life that the committee does not seriously contemplate any alternative. Of payment by capitation it remarks that "under the existing circumstances in this country a renewed attempt to introduce such a system generally could not succeed," and that capitation "tends to a decline in the high standard of practice." Oddly enough, the few doctors who accept patients under the capitation scheme mostly operate the fee-for-service too. In the absence of safeguards (and none are mentioned) this seems to offer the unscrupulous the best of both worlds—the good lives contributing their regular capitation income, the bad ones the fees for service. The committee understandably recommends that practitioners should not be allowed to practise under both systems at the same time, but should be obliged to choose between them.

Having dismissed salaries and capitation, the committee considers how fee-for-service remuneration can be reformed and simplified. It proposes to abolish the refund system, and require the practitioner to make all the claims for his payment. But to salve the conscience of those who object to being paid directly by the State—lest this destroy their professional freedom and the doctor-patient relationship —a form of words has been devised to make it clear that the doctor is claiming the moneys not on his own behalf but "on behalf of the patients listed in column (3)." So into column 3 of the claim form must go the names of all the patients (or their legal

In the U.S.A. the new hopes for the tuberculous which were based on the first trials in that country, assisted by uncontrolled commercial enterprise and an ever-increasing supply (including eventually sales over the counters of drug stores even without prescription), led to a situation where almost every hospital patient with money, and about 50% of all inpatients, were given the drug at some time—whereas more cautious American physicians estimate that it is medically indicated in about 10%. Indeed it is said in the U.S.A. that if your railway dining-car attendant is unsteady and spills the soup down you, tuberculosis should be suspected! Here a more cautious attitude, together with the dollar shortage, has caused the Government to advance warily. During 1947 and 1948 enough streptomycin was imported for M.R.C. trials, later for official release to hospitals for meningeal or miliary tuberculosis, and still later for ulcerative tuberculosis of the larynx, trachea, and bronchi. Apart from the swelling trickle of individual purchases of American streptomycin, officially tolerated as a safety-valve but of rather doubtful morality, the antibiotic has been unobtainable in this country for pulmonary tuberculosis. Now that home-production has increased substantially, we may expect a wider, though still limited, release from Government internal purchases. Will the wave of indiscriminate use follow the American pattern, or can it be modified by self-discipline? Much will depend on the persuasive guidance given to the doctors entrusted with the drug. It may be wisest to confine distribution to tuberculosis officers and other specialists, with access to laboratory, X-ray, and preferably also hospital facilities; for lack of appreciation of the toxic effects of the drug, failure to test cultures for susceptibility at the beginning, during, and at the end of treatment, and failure to watch progress by X ray under standard conditions, may do harm to the patient besides wasting a valuable drug. No doubt there will be temptation to use streptomycin to treat an early lesion, so as to get the patient back to work quickly; to use it instead of collapse therapy or even bed-rest; and to treat hopeless cases to please relatives. But in the vast majority of cases the physician will have a free hand; he can weigh the advantages and disadvantages of streptomycin and act accordingly. Used with discrimination this remarkable new weapon can successfully supplement the proved methods of attack on a small though important sector of the tuberculosis front. The National Health Service can play its part by seeing that the drug is available at the right place and at the right time.

Epidemiology of Staphylococcal Infections

IF measures of preventing and controlling epidemics are to be logically and successfully applied, the sources and paths of spread of epidemic infection must be exactly known. Such knowledge can only be gained when the infecting organism can be accurately defined and identified. Epidemiological studies of the acute streptococcal infections during the last twenty years have given us a valuable body of new information and are an outstanding example of the incentive to research arising from the definition of serological types within a bacterial species. This has only become possible as a result of the differentiation of some thirty serological types of *Streptococcus pyogen* by the late FREDERICK GRIFFITH. Another examp is the phage typing of *Salmonella typhi*, described b CRAIGIE and YEN, which is now being used eve day to trace the sources of epidemics and cases typhoid. More recently the serological differentiation of types among *Staphylococcus pyogenes* and t development of phage typing[2] of that organism ha brought the epidemiology of staphylococcal infectio into the limelight. An organism so ubiquitous as t staphylococcus does not readily lend itself to epidemi logical studies, but the field has been somewh narrowed by the recognition that coagulase-productio will differentiate pathogenic or potentially path genic strains from the rest. Type differentiation b serological and phage methods has therefore bee applied only to coagulase-positive strains.

The main application of typing to the study staphylococcal epidemics has been in institution outbreaks of pemphigus neonatorum. In one outbrea involving 22 infants, ELLIOTT and others[3] conclude that a nurse who was a nasal carrier of the epidem strain had been the source and means of sprea of infection. ALLISON and HOBBS[4] described thr successive outbreaks of pemphigus neonatorum an staphylococcal conjunctivitis involving 132 infan in a large maternity unit, and demonstrated the wid spread occurrence of the epidemic strains in t infants' environment; their evidence pointed to t nurses as the source of infection, with the nas passages as its main reservoir and the hands the probable vehicle of spread. By phage typi ROUNTREE[5] was able to prove cross-infection wi pathogenic staphylococci in 18 out of 82 surgic wounds in a 24-bed surgical ward over a period seventeen weeks. In a study of penicillin-resista strains of staphylococci causing infections in a hospit unit, BARBER[6] showed that of 7 strains isolated fro patients during a single month, 5 penicillin-resistan strains all belonged to the same phage and serologica type while 2 penicillin-sensitive strains belonged to different type, and she attributed the infections spread from patient to patient. Similarly in outbrea of staphylococcal food-poisoning due to enterotoxi typing of strains of staphylococci isolated from t suspected foodstuff, from the vomit or stools victims, and from the nose and hands or septic sk lesions of food-handlers has added to our knowled of the sources and modes of infection. Among t many outbreaks successfully traced to their sourc may be mentioned those described by WILLIAMS et al. in which infection of ice-cream was traced to the no and hands of one of the people who prepared i and by ODDY and CLEGG,[8] who showed that an out break involving 167 miners who had eaten infecte pressed-beef sandwiches was caused by staphylococ isolated from the nose and hands of the butcher wh prepared the pressed beef.

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1. Cowan, S. T. *J. Path. Bact.*, 1939, 48, 169. Christie, R Keogh, E. V. *Ibid*, 1940, 51, 189. Hobbs, B. C. *J. Hy Camb.* 1948, 46, 222.
2. Fisk, R. T. *J. infect. Dis.* 1942, 71, 153, 161. Wilson, G. S Atkinson, J. D. *Lancet*, 1945, i, 647.
3. Elliott, S. D., Gillespie, E. H., Holland, E. *Ibid*, 1941, i, 16
4. Allison, V. D., Hobbs, B.C. *Brit. med. J.* 1947, ii, 1.
5. Rountree, P. M. *Med. J. Aust.* 1947, i, 427.
6. Barber, M. *Brit. med. J.* 1947, ii, 863.
7. Williams, G. O., Swift, S., Vollum, R. L., Wilson, G. S. *Mo Bull. Min. Hlth E.P.H.L.S.* 1946, 5, 17.
8. Oddy, J. G., Clegg, H. W. *Brit. med. J.* 1947, i, 442.

what is known of the tubercle bacillus, it is evident that the conditions necessary for its inactivation will differ from those required for the pneumococcus. Certain experiments indicated that the deleterious effect of 50% humidity on the pneumococcus might be due to increased salt concentration, and similar results have been obtained with influenza virus suspended in a broth containing 5 g. of sodium chloride per litre.[6] (Normal human saliva has only about a tenth of the amount of salt that physiological saline contains.) These American experiments, however, did not include tests with influenza virus suspended in human saliva with and without dialysis, which would give crucial information about the rôle of salt. Edward has suggested that the inactivation of the virus in saliva during drying might be caused by the lysozyme-like agent in the saliva, which might well have a maximum effect at a relative humidity of 50%.

It is obvious that many factors besides humidity play a part in producing an epidemic. But it might be useful to ascertain whether maintenance of the relative humidity at a high level will control the spread of influenza in a closed community.

TRACE ELEMENT PIONEERS

In 1937, when Bennetts and Chapman [7] established that copper deficiency was the cause of enzootic ataxia in Western Australia, not much was known about trace elements in nutrition. The subsequent advances in this field must largely be ascribed to the stimulus applied by the successes of these and other pioneers.

In 1928, after a long series of studies, Hart and his colleagues [8] at the University of Wisconsin had shown that copper as well as iron was essential for the formation of hæmoglobin in the rat, but it was not until 1933 that a disease of economic importance was shown to be due to copper deficiency. This was "liksucht," a wasting disease of cattle in Holland which Sjollema [9] cured with copper sulphate. The enzootic ataxia on which Bennetts and his associates did their classic work is a demyelinating disease of the unborn or unweaned lamb, producing a typical degeneration in the spinal cord which is responsible for the ataxia, usually affecting the hind limbs only. Nutritional disturbances as a rule precede and almost invariably accompany the ataxia. From 1932 onwards, on chemical, clinical, and pathological data, Bennetts [10] built up a working hypothesis that the disease was due to lead poisoning. In his first trials, ammonium chloride, as a "deleading" agent, was fed to gestating ewes and gave very satisfactory results. In a later season the results were inconsistent and it was found that a very pure sample of ammonium chloride did not prevent the ataxia. A spectrographic study of the effective and ineffective samples of ammonium chloride and of livers from affected and normal lambs disposed of the lead hypothesis and suggested that copper deficiency was a more probable cause of the disease. In the next lambing season the administration of copper to the gestating ewe was found to prevent ataxia in the lamb. This was a discovery of major importance to the Australian sheep industry, and, coupled with his prevention of "falling disease" in cattle with copper supplements,[11] has earned for Dr. Bennetts and the Western Australian department of agriculture world-wide appreciation.

Another important early success in trace-element therapeutics, also achieved in Australia, was that of E. J. Underwood and J. F. Filmer. They were investigating a fatal disease of sheep and cattle in localised areas of Western Australia, for which Filmer [12] suggested the name "enzootic marasmus," the principal symptoms being progressive emaciation and anæmia. The disease had been prevented by the administration of limonite ($Fe_2O_3H_2O$) and was thought to be due to iron deficiency. Analysis of the pastures and of organs of affected animals, and finally the prevention of the disease with an almost iron-free extract of limonite, showed that this hypothesis was wrong.[13] By a series of fractionations of this extract Filmer and Underwood [14] finally traced the curative property to cobalt, which invariably checked both the wasting and the anæmia. It is interesting to note that Lester Smith and the American group working on the anti-pernicious-anæmia factor of liver agree that the factor contains cobalt.[15]

DETAILS ABOUT ISOTOPE SUPPLIES

In their statement published in our issue of Sept. 18 (p. 469) the Medical Research Council gave details of the conditions under which radioactive isotopes can now be obtained for research and therapy. Radioactive isotopes require very careful handling by special techniques not normally part of laboratory methods, and with these difficulties in mind the M.R.C. pointed out that stable isotopes of some useful elements were available for tracer research which could be used without any of the protective measures needed for radioactive isotopes. But the estimation of stable isotopes has to be done with a mass spectrometer, a complicated instrument costing about £2000 and calling for more technical knowledge than most medical workers possess.

The Ministry of Supply have now circulated some further information about the obtainable radioactive isotopes and also about stable isotopes and their estimation. At present the Atomic Energy Research Establishment at Harwell is working with a low-energy pile whose usefulness, so far as medically interesting isotopes are concerned, is limited. A larger pile is being constructed, and when in operation (no likely date is mentioned) it will produce isotopes of specifications similar to those now provided by the U.S. Atomic Energy Commission. The low-energy pile has been used to produce radiosodium(Na^{24}), radiopotassium(K^{42}), and radiobromine (Br^{82}). These isotopes are useful in biological research, and since they have half-lives of only a few hours they cannot be imported. The low-energy pile has also produced some radiophosphorus(P^{32}) and radio-iodine (I^{131}) pure enough for use in therapy, but the amounts are too small to be of practical value. When the large pile is operating at full power it will provide these and other isotopes in quantities sufficient to meet all expected demands for scientific and industrial, as well as medical, uses. In the meantime isotopes are being imported, mainly from the U.S.A., and supplies are necessarily limited to the longer-lived isotopes like radio-iron (Fe^{59}, half-life 47 days) and radiophosphorus (half-life 14 days).

The stable isotopes now obtainable are those of nitrogen(N^{15}), carbon(C^{13}), and oxygen(O^{18}). The nitrogen and carbon isotopes have been imported from America, but both will soon be manufactured in this country. The Genatosan Co. at Loughborough is making an enriched N^{15} on a commercial scale. At Harwell a plant for the production of C^{13} is nearing completion, and one for the production of O^{18} will be ready in about three months' time. These stable isotopes are therefore likely to be fairly plentiful before long. With regard to estimation, there are two mass spectrometers at the guardians if they are minors); in column 2 a code letter or letters indicates the service given; column 6 shows the money claimed from the State; while column 5 gives the total amount the doctor intends shall be paid for his services by State and patient combined. To regularise the recovery of fees from the patient the report asks that "every general medical practitioner should have the right to charge and recover a fee additional to that payable from the Fund wherever circumstances, in his opinion, warranted it."

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[6] Lester, W. *Ibid*, 1948, 88, 361.

[7] Bennetts, H. W., Chapman, F. E. *Aust. vet. J.* 1937, 13, 138.

[8] Hart, E. B., Steenbock, H., Waddell, J., Elvehjem, E. A. *J. biol. Chem.* 1928, 77, 797.

[9] Sjollema, B. *Biochem. Z.* 1933, 267, 151.

[10] Bennetts, H. W. *Aust. vet. J.* 1932, 8, 137 and 183; *Ibid*, 1933, 9, 95; *J. Coun. sci. industr. Res. Aust.* 1935, 8, 61.

[11] Bennetts, H. W., Harley, R., Evans, S. T. *Aust. vet. J.* 1942, 18, 50.

[12] Filmer, J. F. *Ibid*, 1933, 9, 163.

[13] Filmer, J. F., Underwood, E. J. *Ibid*, 1934, 10, 83; *Ibid*, 1935, 11, 84.

[14] Filmer, J. F., Underwood, E. J. *Ibid*, 1937, 13, 57.

[15] Lester Smith, E. *Nature, Lond.* 1948, 162, 144.

Since the patient is no longer to be asked to sign the claim form, it is recognised that some alternative method of checking the claims made by practitioners is necessary.

> "It is accordingly suggested that the Department devise a system of verification of service as an alternative to the patients' certification, as, for example, postal inquiry from a proportion of the patients of each practitioner. In addition, it is recommended that all practitioners be required to maintain adequate medical records of their patients in support of all claims made, and that these records and daily diary sheets be subject to inspection by medical practitioners duly appointed for that purpose."

But it looks as though the committee doubts whether these methods of sample and scrutiny will be really effective; for later we are told that it

> "discussed the practicability of prescribing limits to the numbers of patients to be seen daily or, alternatively, of prescribing a limit to the amount payable from the Fund to an individual practitioner. It considered that, in view of the wide variation in local conditions, types of patients, and the capacity of practitioners no fixed or arbitrary limits could be prescribed. Nevertheless, there are substantial grounds for believing that an average of, say, thirty attendances [items of service] daily is the maximum number practicable for an efficient and conscientious practitioner, and the Committee considers that Local Investigating Committees [consisting of local doctors with a medical officer of the health department] should be vigilant to investigate cases which habitually exceed the figure mentioned."

As it appears from the other side of the world, this system which our colleagues in New Zealand are arranging for themselves is by no means attractive. If the Minister of Health here were to propose such a combination of snooping and sanctions he would be felt to have exceeded all reasonable bounds. Moreover, the object of the new plan is to support a method of payment which New Zealanders themselves admit does not encourage good medicine. In his presidential address this year Mr. J. A. JENKINS, president of the N.Z. branch of the B.M.A., said: "It is the quality of the medical service that should count, not the quantity. The present system pays premiums for quantity and penalises care, thought, and time spent. This is basically wrong." But even he could see no alternative to the fee-for-service —"the salaried service, the capitation system, in fact anything that departs from what is ingrained in us is bound to fail"—and he based his hopes on placing administration in the hands of a permanent, predominantly medical, corporate body, and on the levying of additional fees for every conceivable item the patient needs. He believed that "if the government . . . placed a small financial barrier between patient and doctor, patient and chemist, and patient and hospital, many of the present abuses would cease at once." Would they? We wonder. But th we have never had quite the same dislike (in princip of capitation fees, nor the same faith in the fee-f service. In the next year or two this country w have to find whether a capitation system embraci the whole population is compatible with high standa of practice. Meanwhile, if the New Zealand gove ment accept their committee's recommendatio New Zealand will be ascertaining whether the adm tedly unsatisfactory trends of her practitioner serv can be reversed by altering the method of claimi fees.

Annotations

THE ACT IN ACTION

UNDER this title we propose to publish a short se of occasional articles on the working of the Natio Health Service during its first few months. They w describe some of the difficulties encountered and so of the defects observed. Signs of strain can be instructi even when they appear in the less vital parts of organism, and we shall begin by examining one or t of the most conspicuous. The opening article de with the supply of spectacles.

HUMIDITY AND INFLUENZA VIRUS

IT is now recognised that the most satisfactory mea of preserving most viruses is to dry them in va from the frozen state. By this method the virus rapidly desiccated past the presumed critical degree moisture at which its susceptibility to external influen is greatest. Similarly, it has been shown that smallp virus, in infected crusts or in vesicle fluid dried on gl slides at room temperature (22°C),[1] and foot-and-mo virus in cattle saliva, will survive and remain infecti for periods of several weeks to a year or more (smallp crusts) under natural conditions. According to S Leonard Rogers,[2] these findings support his oft-repeate argument that the spread and prevalence of smallpo is least at periods of high relative humidity of th atmosphere.

In exploring the epidemiology of influenza, a numb of attempts have been made to estimate the survival the virus under more or less natural conditions. F example, Edward[3] showed that when a 5% suspensi of infected mouse lung in normal human saliva w allowed to dry on glass slides at room temperatu only 1% of the virus could be recovered when dryi was complete. He also found that when pieces of she were impregnated with a given quantity of mouse-lu virus, and the virus was allowed to dry under differe conditions, much less virus was recovered when dryi was slow because the humidity of the atmosphere w high. Loosli et al.,[4] in Chicago, demonstrated th influenza virus dispersed into the air is killed mu more swiftly in humid than in dry air, and it has no been shown[5] that when pneumococci type 1, suspende in broth, saliva, or 0·5% saliva, are sprayed into th atmosphere, their mortality is very high at relati humidities in the vicinity of 50%. (At humidities abo or below this value they survived for long period

Though a similar type of pattern was obtained wit staphylococci, the results were not nearly so strikin which makes it probable that the effect of humidit depends on the structure of the micro-organism. Fro

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1. Downie, A. W., Dumbell, K. R. *Lancet*, 1947, i, 550.
2. Rogers, L. *J. Hyg., Camb.* 1948, 46, 19.
3. Edward, D. G. *Lancet*, 1941, ii, 664.
4. Loosli, C. G., Lemon, H. M., Robertson, O. H., Appel, E. P *Soc. exp. Biol. Med.* 1943, 63, 205.
5. Dunklin, E. W., Puck, T. T. *J. exp. Med.* 1948, 87, 87.

The Act in Action

1. SPECTACLES

BEFORE the start of the new National Health Service, the output of spectacles from all sources was 4–5 million pairs a year. Representatives of the ophthalmic industry place the present demand at over 650,000 pairs a month (7,800,000 a year). The demand is growing, and the delay in fulfilling orders—which is now from four to eight or more weeks—is also growing, according to the industry, by one week for each week that passes.

The eventual aim is to base all ophthalmic services on hospitals. Meanwhile patients who are not already attending hospital are dealt with under the Supplementary Ophthalmic Services. The original estimate of the cost of these services in England and Wales from July 5 to the end of next March was £2,080,000: the actual amount spent in the $12^1/_2$ weeks up to Sept. 30 was £981,951. Before having his eyes tested, the applicant must obtain from his own doctor a recommendation for examination, written on a form which he takes either to an "ophthalmic medical practitioner" (who draws £1 11*s.* 6*d.* for testing the vision), or to an ophthalmic optician (who receives 15*s.* 6*d.* for his service). If glasses are necessary, the prescription is sent to the local ophthalmic services committee, which, if it approves, returns the prescription to the patient, who then takes it to an ophthalmic or dispensing optician (to whom a dispensing fee of £1 5*s.* is paid). With the present urgent demand fees are mounting up; and the general practitioner is ruefully comparing the capitation fee he gets for a year's service to a patient with the sum—about double—received by the ophthalmic practitioner for a single test of vision. In the school ophthalmic service, at present administered under the supplementary services, the amount earned on capitation fees has certainly sometimes exceeded reasonable need. Hence the school service is to be placed under the hospital board by the end of next March; and until then payment is to be made on a sessional basis.

The approximate numbers operating the service in England and Wales are as follows [1]: ophthalmic medical practitioners 1126, ophthalmic opticians 5821, and dispensing opticians 620. The patient who applies for examination may find that he has to wait from a week up to a month or longer to have his vision tested by an ophthalmic medical practitioner or optician. To this delay must be added the time taken by the executive council's committee to approve the prescription. This was at first as long as a month in some districts, but it has been reduced, except in one area, to a few days; and it is eliminated altogether by friendly opticians who proceed with the order on the assumption that approval will be given. Thus the time between the date of fixing an appointment and the issue of spectacles is at best about 4 weeks and at worst some 3 months.

PRESENT AND FUTURE

It is easy to understand how the present acute demand originates. First of all, there are those who, though needing spectacles, have never before had them made; some idea of their number is given by the popularity of ready-made spectacles before the war, when a single group of chain stores is reputed to have sold 2 million pairs a year. A second group is composed of people who, having a pair of spectacles, seek a re-test; according to one estimate these form 80% of all applicants. Indeed, at least one ophthalmologist, having entered the service and doubled the time given to refractions, finds that he can see only patients who attended him before July 5. In most cases the claim is reasonable because vision was last tested some years ago. Sometimes less reasonable are the claims of the men and women, from all walks of life, who, ignoring the fact that their actual contribution is never more than 10*d.* a week, announce an intention "to get something back for the £12 a year I pay for medical service." This group seeks a tangible return, often in the form of spectacles, for what is considered an unreasonable outlay. A less querulous section hopes for examination simply because the service is free. Yet by general agreement the proportion of applicants not in need of spectacles is no more than 10%. An optician in East London who surveyed the first few hundred patients examined under the scheme has reported [2] that 19% of these patients were wearing glasses for which they had never been examined; 47%, already with glasses, had not been re-examined during the past 4–10 years; and only $16^1/_2$% had never worn glasses before.

THE INDUSTRY'S CRITICISMS

The popularity of the new ophthalmic service was partly foreshadowed by a drop in the sale of spectacles from last January onwards; and the ophthalmic industry claims that if, in the months before the service started, it had been given a chance to prepare stocks according to the scales eventually laid down, present difficulties could have been largely avoided. As it was, the scales were made known only in June. The official scales schedule 19 types of frame to be provided under the scheme —10 to be issued free and 9 on payment of a supplement. If an optician stocks a dozen of each type in two sizes, he will have altogether 38 dozen. This, some opticians reason, is extravagantly many; and the range might be reduced. Nevertheless, despite temporary shortages of one or two types, manufacturers' capacity equals the present demand; and no doubt production, especially of the 7 plastic types which are listed, could be stepped up without great delay.

The position with regard to lenses is far less happy, accounting as it does for almost the whole delay in manufacture. Output is restricted both by the number of skilled workers—for lens-making is a craftsman's job —and by the shortage of machinery for grinding; and there can be no substantial increase in less than two years. In the meantime, some manufacturers believe that speedier service could be assured by reducing the types of lenses. Criticism is directed particularly to the issue of toric lenses without charge "for distant and/or constant wear and for reading when prescribed as being necessary," or otherwise on payment of a supplement. It is pointed out that only 4 such lenses can be produced in the time taken to produce 36 flat lenses.

Unfortunately, for present purposes, the industry was geared to increased production of flat lenses in the war, to meet Service orders; in most other countries only toric lenses are now used. The Ministry of Health says that had only "utility" frames been provided the results would have been (1) to cause a great demand for such frames, leading to even greater delay, (2) to make more people get their glasses privately, thus defeating the objects of the service, and (3) to discourage people needing glasses from getting them. The aim has been to set up a good, popular service—"not a utility one to which public opinion would have been justifiably opposed." If the productive capacity for flat lenses was not being fully used, the position with regard to toric lenses, says the Ministry, would be reviewed.

OTHER ASPECTS

Doctors and opticians sometimes argue—in opposition to the spirit of the Act—that if the patient is to value his spectacles, he must pay all or part of their cost. On the other hand, the service is evidently fully appreciated

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1. *National Insurance Gaz.* Oct. 14.

2. *Dioptric News*, 1948, 3, 357.

National Institute for Medical Research, Hampstead, N.W.3, which can be used for assaying samples for research-workers, and the institute will advise on the preparation of samples of blood and other biological materials. Gas samples can be dealt with at Harwell, but so far only to a limited extent.

Some useful addresses are given in the Ministry of Supply's circular. Inquiries about radioactive and stable isotopes should be addressed to the Isotope Information Office, Atomic Energy Research Establishment, Harwell, near Didcot, Berks. Departments and individual research-workers who propose to use either form of isotope for medical research should apply to the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1. Short-lived isotopes will be distributed direct from Harwell. Isotopes that have to be processed before issue will be sent out from the Radiochemical Centre at Amersham, Bucks.

THE LAW AND INSEMINATION

In the opinion of Mr. Justice Vaisey and Mr. H. U. Willink, K.C., given in the report of the Archbishop of Canterbury's commission,[1] artificial insemination with donor's semen (A.I.D.) constitutes adultery; and this opinion was shared by eleven out of the twelve members of the commission. Mr. Cecil Binney, addressing the Eugenics Society on Oct. 26, took a different view. The law defines adultery, he said, as any sexual act between any two persons of opposite sexes, one of whom is married. In short, some degree of concupiscence must be present; whereas with A.I.D. concupiscence is wholly absent. He thinks it unlikely in any case that suits dealing with artificial insemination will often appear in the courts. Where the husband's semen is used (A.I.H.) no legal complications arise; and he does not agree that such cases might be affected by the Law of Nullity, since a nullity suit can be successful even where the wife has had a child by the husband. Donor insemination, on the other hand, might conceivably give rise to complications under the Criminal Law, the Law of Divorce, and the Laws of Inheritance. The donor has no reason to fear that his behaviour is illegal, since any man can inseminate the wife of another without committing a legal crime; and though the majority of the Archbishop's commission wished A.I.D. to be made a criminal offence, Mr. Binney thinks it is unlikely that this will be done, since it would encourage perjury and blackmail. He contended that no special provision is needed for the case of the wife who has herself inseminated without her husband's knowledge, since a husband could almost certainly divorce her, if he wished, on grounds of cruelty; while the wicked doctor who inseminates a woman against her will, or the adventuress who has herself inseminated so as to make unjust claims on some man, are figures of fiction rather than ordinary life.

Nevertheless, some possible complications do need study. The child is not the husband's, and strictly speaking the mother ought to register it as illegitimate. In practice, however, Mr. Binney pointed out, a married man can accept as his own any child of his wife's, and can make what provision he likes for it in his will. Troubles are more likely to arise when there are entailed properties or funds in trust. Mr. Binney would meet this objection, given his way, by the abolition of entail and settled funds; but he sees no hope of such a solution.

The danger of incest as a result of two A.I.D. children growing up and marrying he considers small—probably not greater than the danger, always present, of any two unknowingly related people marrying. In village communities, and in small communities of English peop living abroad, this is always a possibility, though n one which gives rise to much anxiety. There remai the suggestion that civil proceedings might be tak against the doctor; but this could hardly happen whe husband and wife had authorised the operation. the husband had not been informed, he might, on t curious legal ground that the doctor had interfer with his wife's services to him, take action. This wou be akin to a father getting damages when his daught is seduced. A claim against the doctor could, of cours be made if the operation was unskilfully or negligent done, or if the child turned out to have some heredita disorder or abnormality; or an awkward situatio might arise if a doctor who disbelieved in racial prejudi provided an insular type of woman with a child of noticeably different race.

Mr. Binney evidently felt that though the subje makes a fascinating playground for lawyers, the practi of artificial insemination—even of A.I.D.—on the existin minute scale is likely to give very little trouble to anyon

THE DONORA DISASTER

During the last five days of October a large part western Pennsylvania was covered by a fog blanke and at the steel-making town of Donora 18 elderl patients with asthma or with heart disease died in o day, and about 200 persons came under treatment f the alleged effects of "smog" (smoke and fog). T town hospital became overcrowded, and an emergen hospital was set up. A zinc-smelting plant was closed

The connexion of fog with an increased mortali from respiratory diseases was demonstrated on a statistic basis by Russell, who pointed out that fog alone h apparently no effect; it has to be associated with co weather to make it lethal.[2] He even claimed th "knowing the temperature and the amount of fog, it possible to predict the mortality of the succeeding wee but only with a marginal error of roughly 30%."[3] T question how much of this increased mortality is d to fog, and how much to cold has been discussed b Woods.[4] At Donora, however, it is plain that other factors have been at work. We know that fog produced by an earth-bound layer of cold air prevents factor fumes from rising into the upper air, and it was in th sort of weather, at the beginning of December, 1930 that 63 people died of respiratory disease, within a perio of little more than twenty-four hours, in the Meus valley, in an area 25 by 1–2 km., south of Liège. The deaths there were attributed to atmospheric pollutio with sulphur dioxide and hydrofluoric acid by zinc an superphosphate factories. So extensive had been th pollution that the soil had been rendered useless fo agriculture and spoilt for grazing, and breeders of cattl had obtained damages against the manufacturers. Th fact that electric-light bulbs lost their transparency quicker there than elsewhere points to fluorine as th guilty agent. Of the 27 factories 15 used fluorine containing substances.[6]

The dangers of fluorine have been clearly described, and closure of the zinc-smelting plant at Donora was amply justified by the known facts.

It was announced at Stockholm on Oct. 28 that the Nobel prize for medicine is to be awarded to Dr. PAUL MOELLER of Basle for "his discovery of the effects as an insecticide of D.D.T."

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[1] Artificial Human Insemination. London, 1948. See *Lancet*, Aug. 21, p. 298, and Sept. 18, p. 463.

1. *Times*, Nov. 1, 1948.
2. Russell, W. T. *Lancet*, 1924, ii, 335.
3. Russell, W. T. *Ibid*, 1926, ii, 1128.
4. Woods, H. M. *Ibid*, 1928, i, 539.
5. *Lancet*, 1930, ii, 1305; *Ibid*, 1931, i, 303.
6. *Ibid*, 1946, ii, 835.
7. Kemp, F. H., Murray, M. M., Wilson, D. C. *Ibid*, 1942, ii, 93.
   Murray, M. M., Wilson, D. C. *Ibid*, 1946, ii, 821.

ORGANISATION

Income from all sources is pooled and distributed among the partners in accordance with an agreed plan, laid down in the partnership agreement and subject to modification with the passage of time. The division is assessed mainly on two factors: (1) age and seniority in the group; and (2) the recognised higher earning capacity of surgeon-specialists. The government and administration of the group is entirely democratic, decisions being reached either unanimously or by a wise compromise.

The central office of the group is the ground floor of a large residential house, equipped to provide four sets of consulting-rooms, physiotherapy-room and minor-operations' theatre, general waiting-room, dispensary, and offices. There is also a dark-room for eye and ear work. The first floor of the house provides a residential flat for one partner. All the firm's consulting is done from these premises. The property and equipment is owned jointly by the partners. To prevent standardisation, each partner furnishes his own consulting-room and is responsible for its decoration.

Each member of the group is on the honorary medical staff of the local hospital, which has 50 beds and an elected medical staff. The surgeons and physician each hold outpatient clinics at the hospital. The group keep close touch, both in their private and hospital practices. Apart from formal consultations, arranged at the patient's request, members of the group assist each other in cases of difficulty, without additional cost to the patient. Problems of current interest are continually discussed. The group meets regularly to discuss administrative problems, but hitherto pressure of work has made it impossible to arrange clinical discussion on a formal basis.

Non-medical duties are divided between the partners. These include supervision of staff and finance, supervision of dispensary and ordering of drugs, supervision and [illegible] of instruments, &c., and upkeep of fabric of premises.

The non-medical staff comprises a secretary book-keeper, a part-time shorthand-typist, a dispenser, a receptionist, and a part-time cleaner. The secretary is in a key position, holds great responsibility, and is well paid. The dispenser is "Apothecaries' Hall trained." Wages of the staff amount to £900 p.a., of which the secretary is paid £343 and the dispenser £312. This is not an excessive outlay for a partnership of five doctors. The willingness, interest, keenness, and efficiency of the staff is considered of vital importance. The principle of offloading unskilled work and non-medical administration as far as possible from the partners, as a long-sighted economy, is carefully pursued. Auxiliary help more than pays for itself, by freeing the partners for purely medical work.

DOCTOR-PATIENT RELATIONSHIP

The preservation of the doctor-patient relationship is considered to be an ethical principle of the highest importance to be maintained at all costs. For this purpose, patients are not encouraged to transfer from one partner to another within the group, unless there are special considerations such as transfer of cases from a partner who is so overworked that he cannot cope with his present work, or transfer of a special case to a partner specially experienced in that department—e.g., a difficult diabetic from surgeon to physician, or a difficult surgical case from physician to surgeon.

When another partner treats a patient of a member of the group for a special service, the patient is returned to the original doctor when the service has been completed. If the patient definitely desires to change to another member of the group, he is of course free to do so. No difficulties between partners have arisen for this cause. It has not been found that the service so given has become impersonal, or that the members have sought to pass the responsibility for their patients to the group as a whole. Personal responsibility of one doctor for each patient and free choice of doctor are maintained. When a consultant is required for an opinion or an operation, the patient is free to choose any specialist, inside or outside the group, and no pressure is applied to influence his choice. The group emphasises the place of the family doctor as the key man, directing and coordinating treatment.

SCOPE OF SERVICE OFFERED

The scope of the group is adapted to the needs of the district. It is limited in this area by (1) shortage of hospital-bed accommodation, excluding accommodation for such specialties as ear, nose, and throat work (except tonsil operations) and ophthalmic cases; and (2) the comparatively small size of the area served, which limits the group to the major specialties. The group's service is at present confined to general medical, surgical, gynæcological, and obstetric work, with provision of consultant service in each department, modern anæsthesia for all cases, and facilities for some highly technical procedures which are not always available outside the special departments of big hospitals. Raising the standards of general medical practice within the group is considered as *important as providing additional facilities for treatment.*

X-ray, pathological, and orthopædic services, as well as the minor specialties, are provided by the local hospital, or by a large non-teaching hospital 15 miles away. No gross inconvenience is caused either to the partners or to patients by the fact that these services are not available within the group.

PHYSIOTHERAPY

Physiotherapy for private patients had been inadequate in the area until the group introduced a physiotherapist. Though the group could finance, accommodate, and use a full-time physiotherapist, it was thought undesirable and unethical to restrict her services to doctors or patients of the group, and she now works in exactly the same way as any other masseuse in private practice, except that she uses the group's clinic for her headquarters and consulting-rooms. To attain close liaison with practitioners outside the group, she is willing to treat patients in other doctors' consulting-rooms, if the necessary apparatus is provided.

In the difficult post-war economic conditions it was clear that no physiotherapist would set up in private practice in this area without being sponsored. That an efficient and keen masseuse is now in active practice in the area is looked on as yet another advantage to the population of the area, whether they are patients of the group or not.

RELATIONS WITH MEDICAL PRACTICE OUTSIDE THE GROUP

The local hospital forms an integral part of the life of the group. Of seven members of the "limited" honorary medical staff five belong to the group. At an early stage it was realised that an efficient hospital was essential to the group (just as the efficiency of the group was essential to the hospital), and later members of the group were chosen with this principle in mind.

The group has two equally important spheres of activity and cooperation—its own consulting-rooms and the hospital. Close contact is maintained between members of the group in their hospital work, surgeons advising on surgical aspects of medical cases, and the physician being available for preoperative examination of operation cases and for advice on postoperative treatment. Without the hospital the group would not have by wives (who may hitherto have unselfishly foregone their claim) and by old people.[3]

Among the wealthier patients a few go to great lengths in trying to obtain through the service spectacles prescribed by a private ophthalmologist of their own choosing. Otherwise there seems to be singularly little abuse by the patient. Indeed, abuse is made very difficult by the triple check enforced by the family doctor, the ophthalmic practitioner or optician, and the executive council's ophthalmic committee. But if there is little abuse, there is equally little inclination to pay for extra service. Among opticians private practice has almost ceased, and now accounts for only about 4% of all work; and an optician in the heart of a very wealthy urban area reports that of 300 people supplied with spectacles under the scheme only 4 have opted for one of the varieties on which a supplement is payable.

There have of course been mistakes and difficulties in administration. Ophthalmologists complain that practitioners sometimes misuse the form recommending test of vision to refer a patient who should properly go to hospital. An ophthalmologist who takes a school clinic is irritated by the experience of being unable to obtain non-splinterable lenses for children at the clinic.

Opticians, for their part, observe with some anxie that payment is slow in reaching them. These a mostly passing annoyances. The one formidable dif culty is in the supply of lenses.

Doctor, optician, and patient are at one in reasoni that no ophthalmic service can be truly efficient so lo as the delay in supply is a month or longer. Amo the ways in which delay could possibly be curtailed these:

1. *Eventual increase in production of lenses.*
2. Limitation in the types of lenses.
3. Restriction of the service to the patients most urgen needing spectacles—e.g., for work or reading.
4. *Propaganda urging temperate use of the service.*

None of these courses, except the first and perhaps t last, is likely to find general support. To the cru question of how soon and at what level demand settle there is still no firm answer. Mr. G. H. Gil secretary of the British Optical Association, belie that 40% of the population require an aid to visio that a fifth of this proportion still have no suita spectacles; and that the eventual demand from whole of Great Britain will be in the neighbourhood 7 million pairs of spectacles a year, costing about million.

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[3] *Ibid.* p. 358.

Special Articles

A MEDICAL GROUP PRACTICE

Two Years' Experience

A REPORT FROM THE GROUP

THE experiment outlined here is constitutionally English in nature—that is, it has developed freely and naturally in response to local needs without any outside pressure or copying of any model. It is capable of infinite adaptation according to the locality. No attempt has been made to provide a complete medical service. Its function is mainly to complement the medical service in the neighbourhood and to provide treatment, otherwise obtainable only at a distance, in the patient's home town by the doctors who know his particular needs.

The group under consideration was formed in 1945 by the fusion of two old-established medical practices, each previously containing two partners. The motives which led to its formation were:

(*a*) To provide a comprehensive medical service for the patient in his own locality and within his financial means, by increasing the scope of domiciliary and hospital treatment.

(*b*) To increase the scope of each member of the group by providing him with greater experience in his own specialty and thus to increase his competence and skill.

(*c*) To raise the standard of professional skill by mutual consultation.

An illustration will make the first motive clear. A small "group" of two—specialist surgeon and specialist physician—cannot undertake dissection of tonsils without the aid of the special skill of a specially trained anæsthetist. It was therefore necessary to introduce an anæsthetic specialist into the group, and the surgical scope of the practice was thus widened.

The group works in a country town of 10,000 population, the surrounding countryside containing a further 15,000. The area has a radius of 8–10 miles. Two other doctors practise in partnership in the town. The nearest large centre of population is a city 15 miles away. The group is composed of a surgeon-obstetrician (F.R.C.S.E.), a physician (M.D., M.R.C.P.), an anæsthetist (M.B., D.A.), an assistant anæsthetist (M.B.), and a second surgeon (F.R.C.S.E.). The five members of the group all have specialist experience, four out of five having served in late war as specialists in the Services; four out of are members of the B.M.A. part-time consultants r

All members of the group undertake general practi all, except the senior partner, undertook N.H.I. w The physician does no midwifery. Members retain th own patients, but there is close intermingling. E partner has a recognised deputy, who stands by for and is introduced to his patients as far as possi The anæsthetist gives all the surgeon's anæsthetics the set operating lists, irrespective of the nature of operation, and either he or the assistant anæsthe gives anæsthetics for all but minor emergencies. T casual or occasional anæsthetist is thus eliminated. T two surgeons assist each other at all set operations benefiting by each other's experience and shortenin duration of the operation. The second anæsthet specially trained in transfusion technique and acts blood-transfusionist to the team.

The following is an example of the group's cooperati and organisation:

A patient was referred to the surgeon as a hospital o patient diagnosed as having carcinoma of the cæcum and la admitted to hospital for resection of bowel. He was se by the group physician for assessment before operatio It having been decided that the procedure was well with the capacity of the group, the operation was performed by t first surgeon, assisted by the second surgeon; the anæsthet (thiopentone, cyclopropane, and curare) was administe by the first anæsthetist, with the second anæsthetist standi by ready for blood-transfusion if required. Thus all fi partners in the group were intimately concerned in t management of one surgical case.

The organisation of the group fits closely into th definition laid down by the American Group Practic Council:

> "In order to be considered a medical group practic unit, an association of physicians of different skills, usin medical equipment and nursing, technical and admini strative personnel in common, must have a formal patter of professional collaboration, a definite relationship as group with a hospital or hospitals in the community an a unified administrative and financial organisation."

Using American terminology, this is a service group consisting of general-practitioner specialists, with an added "reference" function in which manner it is used by the practitioners of the outlying villages.

The success of this group has been built on complete dom of action as a group, and on the much-discussed onal profit motive. How greatly it will be affected restrictions imposed on part-time consultants prac- ing in groups, where some members have G.P. contracts h local executive councils, remains to be seen. Any ial attitude which prejudices the free action of the eral practitioner consultant is likely to be fatal to dical group practice.

CONCLUSION

Though reference has been made to the P.E.P. broad- et *Medical Group Practice in the U.S.*, it should be arly understood that the conclusions reached by this glish group were independent of any outside experi- e, and that the group developed out of the individual perience of two of its members, without any contact h, or experience of, other such groups in the United gdom or abroad. This report was, in fact, prepared fore the P.E.P. broadsheet was published, but it was equently rewritten to comment on some aspects of up practice emphasised by American exponents, h whose experience this group is in remarkable cord.

SUMMARY

A highly successful experience of two years in group actice is discussed.

The group comprises a physician, two surgeons, gynæcologist-obstetrician, two anæsthetists, and a ysiotherapist.

Each member undertakes general practice as well as own specialty.

The group works on a basis of planned coöperation, finances being pooled and distributed on an agreed

The advantages of the group practice as distinct from e of individual practices and financial combines are cribed.

disadvantages have been found in this group ce.

NEW ZEALAND MEDICAL SERVICES

FROM A NEW ZEALAND CORRESPONDENT

SELF-CRITICISM is not one of the more obvious qualities the New Zealander. Indeed a distinguished visitor has ently accused us of smugness. So perhaps as regards State medical scheme one would not expect the doctors be very vocal in criticising the goose that lays the lden eggs. After all they are 7*s.* 6*d.* ones, even if it a goose that lays them. But criticism has been more pparent lately, even to discussion in the House of presentatives; and now we have the report of a mmittee, consisting of officers of the department of alth and representatives of the British Medical Asso- ation, set up last October to examine the medical ovisions of the Social Security Act and their admini- ration, and to advise what alterations are needed to e effect to the government's policy of making available equate and proper medical services (general and cialist) free or substantially free of cost.[1]

New Zealand has hitherto had no disciplinary body cept the Medical Council, which corresponds to the eneral Medical Council. There has been nothing alogous to a panel committee, and nothing to main- ain ethical standards above the level of "infamous" behaviour. There was indeed provision in the Act and its regulations for the establishment of such committees; but, with the medical profession unwilling partners in the operation of the system, nothing came of them. The new report now agrees to the need for disciplinary bodies, and suggests that they should be set up at two levels. There should be a local investigating committee for each health district to hear complaints against doctors and to investigate allegations of over-prescribing. If it finds that there is a case to answer it is to refer it to a disciplinary committee which would have power to deal with all complaints not serious enough for the Medical Council—presumably on the same basis of fines up to £50 as the original Act provided. There is also to be a General Advisory Committee, recognised by the Minister as the chief consultative body in all matters affecting medical services.

In considering general-practitioner services the committee were satisfied that in some cases doctors were receiving annual sums much in excess of what could be regarded as reasonable remuneration. As a check on this they suggest that 30 patients a day is as much as a doctor can do justice to, and that where he habitually exceeds this number he be invited to meet the local investigating committee. But they do not favour a change from the fee-for-service system, a great merit of which, from the doctor's point of view, is that it leaves him free to accept or refuse a call as he wishes. Some changes are suggested in the payments. An extra 2*s.* 6*d.* is advocated for home visits, so as to discourage large surgery attendances and to bring the system into line with the custom, already common, of making an extra charge for going out. Telephone consultations should be paid for at a rate up to 5*s.* in rural areas approved by the medical officer of health. Where the only service is to repeat a prescription no payment should be made—a recommendation in which the committee show a certain naïveté: what happens if the doctor *looks at the patient's tongue?* Finally it is suggested that the doctor's right to recover fees at law should be restored, provided that the patient is given a month in which to refer the matter to the local investigating committee.

Hitherto specialist services have not been covered by social security, and the only contribution the patient could get was the 7*s.* 6*d.* standard fee. The committee think that specialists should now be brought into the scheme, and suggest that for their recognition, which would need legislation, there should be four requirements—adequate training, a higher qualification, hospital experience, and recognition by the applicant's colleagues. Most specialists will have to be part-timers, and the committee advocate the system under which hospital staffs are chosen from local doctors, instead of being purely internal, as a means of increasing their number. Many knotty problems are left for future consideration, including most of those concerned with remuneration: but they suggest that the contribution for a consultation, for which the usual fee is £2 2*s.*, should not be more than £1 10*s.* In any case the fund is going to be landed in further heavy commitments, and any decision as to the introduction of specialist benefits must take seriously into account the financial obligations involved.

The heavy, indeed enormous, cost of drugs has long been the subject of apprehension. Something has got to be done about it, and the committee suggest two approaches. The public ought to pay at least a proportion of the cost, except in cases like the supply of insulin: and the doctors should work to a revised formulary, with the possibility of appearing before the local investigating committee as a deterrent against over-prescribing.

Drastic changes are suggested in the method of paying general practitioners from the fund. In the first place it should be for the doctor to make the claim, thus eliminating the present alternative by which the doctor charges his fee and leaves the patient to recover 7*s.* 6*d.* from the fund. Secondly, the individual certificates signed by each patient after he has seen the doctor, which now serve as the authority for payment, should come into being, and the group is wrapped up with its future.

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[1] A summary of the report, from our regular New Zealand correspondent, appeared on Oct. 2 (p. 545).

All routine general surgical and gynæcological operations and abnormal obstetric cases are undertaken, except the more uncommon and the most extensive, which are passed on to specialists with greater experience of these departments. Thoracic and cerebral operations and the more specialised orthopædic procedures are not undertaken, since the function of the group and this *hospital is not to compete*, but to coöperate, with other hospitals and to do all straightforward operations and investigations sent in by surrounding doctors. The surgeons and physicians hold weekly sessions for outpatients.

Close liaison with the nearest non-teaching hospital is maintained. Members of the group pay weekly or occasional visits to the hospital departments, both inpatient and outpatient. It is hoped that this will develop into their official recognition as clinical assistants to the consultants of the larger hospital. Until recently the *principal limiting factor* in this advance has been shortage of time of group members.

Many local practitioners refer cases to members of the group for specialist opinions, whether in hospital, at the group consulting-rooms, or at the patient's home. Besides this, two members of the group have been instrumental in forming a medicochirurgical society, of which all doctors in the town and countryside are members. This society has proved of the utmost value professionally, socially, and medicopolitically.

ADVANTAGES OF GROUP PRACTICE

The advantages, to doctors and patients, accruing from *any form of medical combine* can be divided into those particular to group practice (using the term in the "team" sense) and those common to all forms of medical partnership, including those combines which are financial only. The advantages of the latter include reduction in overhead charges, such as rent and service in joint consulting-rooms, the provision of additional secretarial help (which, perhaps, a practitioner in solitary practice could not afford), and mutual assistance with off-duty and holiday periods, eliminating the need for a locum tenens. These advantages represent a great financial saving to doctors working in partnership.

The advantages obtained from group practice are not, however, of a financial kind. It is doubtful if there is any direct material gain from group practice, except for younger members of the group, who may receive a larger guaranteed income in their earlier years. Other members of the group could earn equal incomes if practising in small partnerships. To quote from the P.E.P. report, *Medical Group Practice in the U.S.*, citing the American Medical Association's questionary :

> "If the physician's ambition is to make all the money possible in the shortest space of time we certainly would not recommend group practice. If his purpose is to have an adequate income with an assurance of its permanency, and under conditions where he can practise his profession under the most ideal conditions, we would recommend group practice beyond any method we know. In other words, if the physician's motive is to render the best possible service for the greatest number of people for a remuneration which is adequate but not extreme, the plan would be by us highly recommended."

This judgment by American group practitioners is heartily endorsed by all members of this group for the following reasons :

(1) The first advantage is raising the standard and broadening the scope of general practice.

(2) Consultant's opinion and treatment can be made available without delay and with the minimum of expense to the patient. This is of particular importance if an acute abdominal case is involved, or as regards the money factor, in less urgent cases, when the consultant has to be summoned from some miles distant.

(3) If a patient has to go to hospital, he is cared while an inpatient, by his family doctors through his stay, with immense personal advantages, compa with treatment in a hospital remote from his hom where care, though efficient, may be very imperson Patients have less dread of illness if they know th they remain throughout under the care of known an trusted doctors. There is no reason why group medici should lead to an impersonal attitude of doctor to patien

(4) The combination of general practice with specialis tion has a highly beneficial effect on the specialis making him more practical in his approach to th patient's problems, and making him *think in terms* patients and not in terms of diseases. An addition benefit is gained by the specialist in doing more wor in his own line (thus maintaining and improving h technique) than would be possible if he worked *in th* more restricted field of a small partnership.

(5) Additional services *can* be provided by a grou which smaller practices cannot afford. An instance this is the introduction in this area, within the la two years, of two specialists in anæsthesia, a seco surgical specialist, and a physiotherapist, none of who might have been available if the previous arrangement individual two-men partnerships had been retained.

(6) The "staggering" of *consulting-hours* can ma one doctor available at the group consulting-roo throughout almost the entire day. This is convenie for ambulant patients, besides ensuring that one doct is on call for urgent cases.

(7) Not only can locums be dispensed with but wh one doctor is on holiday another doctor who is famili to the patient and conversant with his case can take place.

(8) Minor advantages are the sharing of facilities medical education, given by an efficient *practice librar* and continual discussion of medical problems wi experienced workers, together with the continuo stimulation of enthusiasm which work in a good te provides.

(9) Group practice helps to prevent the staleness a "out-of-dateness" which often afflict the middle-ag general practitioner. This type of practice affords a excellent alternative for the keen well-qualified youn doctor, who previously had to choose between gener practice and pure specialisation.

(10) Service with an efficient group is an excelle training in domiciliary medicine for young graduates.

No disadvantages have been found by workers this team, either to patients or to themselves. Th dangers of "mass-produced" medicine have bee carefully avoided, and any attempt to create a monopol or to restrict in the slightest degree the patient's fr choice of general practitioner inside or outside the grou has been rigidly excluded.

ENDURANCE OF A GROUP

The difficulty in personal relationships within th group has been fully realised, and guarded against as f as possible by careful selection of entrants and by a equitable and comprehensive partnership agreemen Agreeable wives are as important to a practice as co patible doctors, and this too has been borne in min The endurance of a group largely depends on co patibility of temperament of the partners and the loyalt of their wives. Without such compatibility a grou is likely to degenerate into a mere financial partnershi or else to break up. The health of this group depend on the enthusiasm and liberty of action of the partner (within the broad limits of the partnership agreement). If a partner proved unsuitable for the practice (or afte a satisfactory period became so), and if the other partne could not remove him on grounds of *incompatibility* the effect would be very serious.

when I was lifted on to the bed-pan and only grunted and swore.

To disguise our emaciated pallor I and some of my immediate neighbours who were in this swindle asked be carried outside so that we could get sunburnt. At t things seemed to be going well. With the aid of the rd physiotherapist I sat up in bed and tried to bend y right knee on the amputated side over the bed, the her one being in plaster. Here indeed was progress: er the edge of the bed went my amputation, and couraged by the rest of the ward I bent the knee— thought I did, but the knee flexed only a matter of . This was stark tragedy. For 2½ months I had been nning my life on the lines of one ankylosed knee and e below-knee amputation, and now it looked as though re must be two ankylosed knees and an amputation. few days later I had to face the fact that all was not ll with the amputation, in spite of the most careful rgery and untold mega units of penicillin. The atten- n of the ward M.O. was drawn to my discovery by the und of suppressed weeping from behind a screen, for had found the right tibia making an unexpected pearance through the skin. I had developed a seques- um. Once again new plans had to be made and another ce of ill fortune digested.

By this time I felt that about everything in the book d happened to me and that all would be plain sailing. iling was the operative word, for a few days later three us were told that there was room for us in a ship ling next day. This was a real piece of luck. Our ir was out, we were bathed and changed, and the n in the next bed with a fractured spine somehow cked for me. The last of our carefully hoarded whisky s shared out and swallowed, and with the aid of a pnotic we settled down for the night with a great fusion of thoughts. Further confusion was added as e went to sleep by the night sister telling us that the had been cancelled. Next morning gloom lay in dark layers all round the ward. At midday the ter burst in waving a chit and announced that if uld be ready in an hour we could go. The sun through, another bottle of whisky was produced, another phase was over.

We landed at a West of England port and were delivered hospital trains to an E.M.S. hospital, where we were dled like fragile porcelain. Here I had a first sight my wife, and my secret fear that she would be repelled a limbless man was soon dissipated. Self-confidence an to grow as my family came down from the north visit me, and when friends made arduous war-time urneys to spend an hour with me. I did not see that y in their eyes which I had dreaded since I was unded. I was soon moved to a hospital nearer my me where I could be looked after by my favourite rgeon. A few weeks later it was decided to do a questrectomy on my amputation. This went off y well and all appeared to be under control nically.

A further blow was in store. This time it took the form a red-tabbed Army colonel who gave me a medical ard, announced that I was no further use to the Army, aded me category E, asked what my plans were, and ggested the "psychiatry racket." His idea was that should be carried in on a stretcher to learn all about it psychiatry clinics. This was rehabilitation on the and scale, especially as I had estimated that I would another year in hospital. Being graded category E as really bad news for it meant that I must henceforth st on a disability pension. However, with the aid of y friends I was given a respite and my discharge ncelled.

My left knee was still painful, but I no longer needed sit on an air cushion and I could lie down and sit up t will. Another few weeks and a further reamputation was performed to mobilise an adherent scar. It was done by a personal friend and the anæsthetic was given by an old colleague of mine. The result was a secondary hæmorrhage, and I felt sorrier for them than I did for myself when a few days later a rather exsanguinated amputee had to be whipped down to the theatre to be religatured. Soon after this I could lift my ankylosed leg with the plaster on without too much pain. I went out in a spinal carriage to the cinema and to that mecca of all men in bed—a pub. Shortly afterwards I essayed a wheel-chair, and here at last was true independence. With my leg stuck out in front I could propel myself round the hospital; I could attend the physiotherapy department and have active exercises with my right knee, which was now flexing to 50°. After three months the day came when my calliper was delivered, but after being forced upright on to crutches I found that will-power alone was not sufficient to lift myself long. A month of exercises and it was just possible to make progress.

The next milestone was when I got my artificial limb, and, with a calliper on one side and an artificial limb on the other, I walked. This was the day I had dreamed of. It was an erratic, wavering, shaky walk, but I was proud of it. Several weeks later I was offered a job doing medical boards, when I was out of the Army. Accordingly I travelled to London, was boarded out, shaved off my moustache, and danced at one of the more fashionable hotels. This was a huge success, for I was not the complete social outcast I had anticipated. I started doing medical boards and felt that for the first time for 18 months my existence was justified. I was actually doing something to keep my place in society. Then a post was offered me in a Ministry, and after a London interview I was accepted. By good luck and unremitting endeavour I managed to obtain an unfurnished flat in London and have lived there for the past three years. A year ago I was appointed to the permanent pensionable staff of this Ministry and am working alongside fit men and not in any sense a passenger. In fact, ambition keeps biting me to undertake a job where there is more work and movement. I walk without a stick or calliper and have developed my own mode of life for entertainment purposes. At theatres and cinemas I take a left-hand seat and put my ankylosed leg in the aisle on a small folding stool, where it is not so noticeable as might be expected. The reason I rest my artificial leg on a stool will not be far to seek if any six-footer will try sitting down on a chair with his leg straight, for it either means sitting on the edge of a chair or sitting with the spine extended.

In my usual restaurants I am well known and when I sit down an unobtrusive chair is provided on which to rest my leg. I drive a car, dance occasionally, and go swimming when I can obtain solitude and freedom from curious stares, for my method of entering the water is unorthodox as I cannot hop and do not wear a prosthesis. I am a chronic spectator of all kinds of sport and have stood through two rugby matches one after the other on several occasions.

I still feel sure that had the surgeons yielded to my pleas to amputate this limb, life would have been much more comfortable and I still would have walked without sticks. However, there is still the chance of an arthroplasty when the results are a little better. I have patches of depression and frustration three or four times a year, but fortunately both my wife and I recognise them for what they are and take the necessary steps. Altogether life is a great improvement on what I had anticipated four years ago, but nothing will ever convince me that an ankylosed or arthrodesed knee is a good thing to have. Of the things that irritate me, one is being called a cripple as opposed to disabled, and another is having my amputation referred to as a stump.

be abolished, and a new form of claim substituted. This would consist of a single sheet giving the date, the name and address of the patient, the type of service rendered, the total fee charged, and the amount claimed from the fund, with a certificate at the bottom, signed by the doctor, that the claim was a true one. There would be two checks on the genuineness of the claims, (1) a scrutiny of the practitioner's records by a medical inspector, and (2) postal inquiries from a proportion of each practitioner's patients. In thus handing out what is to all intents and purposes the equivalent of a blank cheque the authorities may not be as green as they seem at first sight. There have undoubtedly been abuses of the old system, but it has been almost impossible to bring them home, for under the present system there have to be two parties to a fraud, and one of them, the patient who has signed a misleading receipt, is not likely to appear as a witness against a doctor and thereby admit his complicity.

The committee's report consists only of recommendations; and many, if not most, of them are sure to be the subject of controversy. One thing is certain—that the present system, a pioneer in the field of socialised medicine but one that has never been thoroughly overhauled, is in need of a spring-clean.

ORGANISATION OF CANCER SERVICE

WHEN, in July, the governing body of the Liverpool Cancer Control Organisation transferred their responsibilities to other hands, the Organisation had existed for some ten years; and in the light of those years of experience a series of principles has been formulated, and printed in the annual report,[1] for the guidance of those who will now have charge of the service. These principles were laid down when it became clear that, contrary to the Organisation's hopes, the radiotherapeutic centre was not to be an integral part of the teaching hospital.

The first principle laid down is that the respective duties of the regional hospital board and of the board of governors of the teaching hospital in regard to the diagnosis and treatment of cancer are distinguishable but complementary, and that the utmost coöperation is desirable. The regional board's duties should be to provide diagnostic and therapeutic services in all suitable hospitals, including the teaching hospital, and to afford such facilities for teaching as the university may require. For their part, the board of governors should provide, as part of the regional board's service, arrangements for diagnosis and treatment of patients attending the teaching hospital; and they should ensure that these arrangements are sufficient for undergraduate teaching.

Thus the requirements of the regional hospital board comprise: (*a*) from their own resources, a regional team of radiotherapists, medical staff other than radiotherapists employed in regional hospitals, and a headquarters institute for the radiotherapeutic staff; (*b*) from the teaching hospital, medical staff other than radiotherapists employed in the teaching hospital, such treatment facilities as the teaching hospital can provide, and the ancillary services of a general hospital.

The requirements of the board of governors of the teaching hospital comprise: (*a*) from their own resources, medical staff other than radiotherapists, and treatment facilities for complete undergraduate instruction; (*b*) from the regional board, the services of visiting radiotherapists, and access to the radiotherapeutic headquarters institute for such treatment as cannot be provided in the teaching hospital.

The essential condition for an efficient service, says the report, is joint diagnosis and treatment by radiotherapeutic and other medical staff, except where, by full agreement, treatment is conducted solely by one or the other. A cancer diagnostic service staffed by one or other of these two groups alone is thus preclude and such an arrangement is also ruled out for the reas that: (1) the volume of cancer cases arises from an less than the total volume of initially undiagnosed ca attending hospital; (2) diagnostic services being nee in all suitable hospitals, a single hospital is inadequ for the purpose; and (3) from the patient's standpo the diagnostic services are best located in the nor centres of hospital service and not in a hospital ide fiable as a cancer hospital. Furthermore, hospi beds should be allocated to radiotherapeutic and ot medical staff according to the proportions in wh purely radiotherapeutic and joint treatment are lik to be employed.

The administrative arrangements recommended in report include the establishment of a cancer servi medical advisory committee to assist the regional boa

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Disabilities

16. LOSS OF A LEG

AT about midnight $4^1/_2$ years ago the blast of a Germ Schu mine took my right leg off. I knew what h happened—it was not necessary to soldier in Italy lo to encounter this situation pretty often in others—a my mental condition was not improved by my thinki that I had been blinded, for I could see nothing and cou not feel my hands. At that moment I felt so unutterab lonely that my instinct of self-preservation fled entirel and a vivid memory is of my head falling to the grou in a helpless despair. Then light dawned, in the lite sense, and I found I could see again. It was only trac shells, but it was vision, and from that moment m efforts at rehabilitation started.

After the usual progress " down the line," with perio of semiconsciousness in which comforting faces ma fleeting appearances through mists of sleep, morphin and pain, I arrived in a general hospital not far fro Naples, and when at last it was possible to take an intere in my environment I found myself in a ward full o amputees. True to form—" doctors and nurses neve have anything straightforward "—everything wen wrong with me, and after a series of operations, reamp tations, plasterings, and splintings, I realised tha must face the future with my right leg off below th knee and my other leg ankylosed at the knee with foot-drop. My arms were still in bandages but the were going to be all right.

I knew that further surgery was pending, so I set mysel targets to attain over the next year, which I estimate would be spent in bed in varying degrees of pain. Th first target was to get back to England to see my wif whom I had left $3^1/_2$ years before; for the thought o seeing her again had borne me up in my worst moment of emotional upset and churlish tantrums. If you ca imagine the worst pain *you* have ever *felt* concentrate into one small part of your body you will know what i means to have a pyarthrosis of the knee. Even slee offers no release, for directly the muscles relax th starting pain in the knee comes back and full conscious ness is regained with a scream.

This was my life for three months—lying in be watching other wounded being carried into the war and seeing them walk out again while I remained stati having three-hourly shots of penicillin, watching bottle dripping blood into me, and listening to the rumble o Vesuvius and the guns from Cassino. In the last of thes months I realised that a very serious effort would hav to be made if I was to get back to England. All the friend I had clung to in the ward were being evacuated, and her I still was. So I embarked on a campaign of saying I felt fine, for by this time my leg was in plaster and the knee becoming less painful. I also forebore to scream

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1. Liverpool Cancer Control Organisation: Annual Report, 1947–48. Issued from 80, Rodney Street, Liverpool.

Letters to the Editor

THE FULL-TIME SPECIALIST

Sir.—At the last meeting of the Leeds Regional sultants and Specialists Committee, following a ussion upon domiciliary visiting by full-time cialists, it was decided that no full-time specialists uld be allowed to take part in the scheme for iciliary visits with or without pay; that any such would impinge upon the prerogative of those cialists working part-time in hospitals; and that, as profession was solidly against a salaried service, cialists should be discouraged in every possible way m remaining full-time and should be encouraged these financial penalties to take up part-time k.

n this region most of the consultants I know are loyed the maximum of eight sessions per week in pital. With the weighting already given, and iciliary visiting, they will be receiving, for about hours a week, the remuneration of the full-time ialists, who have no time-limit to the hours worked who are in many cases now doing 40–50 hours a k.

it the opinion of the profession that specialists are be discouraged from working full-time? That they to be prevented from indulging in professional ivities outside their hospital work? That appoint-ts under the boards are to be limited as far as possible part-time specialists, and full-time appointments not going to be made except in very special umstances?

ncidentally, the Leeds regional committee is in my ion an illegally constituted body. Its constitution decided upon at a meeting of a committee represent- the non-teaching voluntary hospitals, who arbitrarily ded to exclude hospital areas from participation e the hospitals were mental, fever, or tuberculosis.

ax. H. I. DEITCH.

LOCAL INFECTIONS TREATED WITH DIBROMPROPAMIDINE

—Lest the article by Kohn and Cross, in your of Oct. 23, engender false optimism, we feel it ary to record briefly our experience of local chemo- py with dibrompropamidine isethionate ('M. & B.). Using a 1·5% cream in the carbowax base recom- led, we have now treated 8 inpatients (6 burns, dermatitis) suffering from surface infections with domonas *pyocyanea*. The cream was applied for ods of four or more days. In 4 of the cases it was lied daily, and was combined with perfect dressing er which minimised the possibility of added infection. no case was appreciable clinical or bacteriological ovement noted. All the strains of *Ps. pyocyanea* ted were inhibited in vitro by 1:1000 dibrom- pamidine.

On the other hand, our results confirm the effective- of dibrompropamidine in treating surface infections to *Streptococcus pyogenes* and *Staphylococcus aureus* uding penicillin-resistant organisms). The bacterio- al findings have been clear-cut, and the clinical lts good. We would recommend the use of the drug re penicillin-resistant organisms are found, and in ients previously sensitised to penicillin. Controlled ls are now commencing, and it is possible that for e organisms a less concentrated preparation will ce and be less likely to have undesirable side-effects g., toxicity to leucocytes). It is also hoped to estigate the use of the drug as a prophylactic against *pyocyanea* infection of burns, for it is not impossible t a drug might pass this test in spite of its failure as a rapeutic agent.

J. P. BULL
W. P. DALLAS ROSS
J. R. SQUIRE
ELIZABETH TOPLEY.

M.R.C. Industrial Medicine and
Burns Research Units,
Birmingham Accident Hospital.

TREATMENT OF BURNS

SIR,—With fashion rooting about in the past for something to whet our jaded appetites, may I make a plea for the *resurrection of tannic-acid jelly?* I have used this agent for many years and still believe it to be the best of all protectives for severe burns.

The excellent article by Dr. Colebrook and Dr. Hood (Oct. 30) suggests to me that results, when it is properly used, are consistently good because a thin film of it approximates to the ideal flexible membrane postulated as a necessary guard against "infection through soaked dressings."

Dr. Gissane, as I found on a visit to the Birmingham Accident Hospital during the war, certainly picked a winner in 'Cetavlon' as an initial cleansing agent. After using this I apply a thin coat of tannic-acid jelly and a single layer of gauze. This is allowed to dry as far as possible before packing with cotton-wool. On subsequent days more jelly is added to repair sodden areas until a firm dry scab of gauze and jelly covers the burnt area. Healing is usually rapid, and the artificial scab flakes off or can be removed like autumn leaves.

Naturally, with advance of knowledge we have added sulphonamide and penicillin to the local and general treatment. This diminishes unpleasantness, as the method has something in common with the Winnett Orr plaster for osteomyelitis and external appearances are far from elegant. My last case was a large second and third degree burn of the buttocks and anus in a child of 3. It required some fortitude to persevere with the outwardly dismal dressing. But the boy was discharged healed without a scar.

There is one considerable word of warning: *never encircle a limb or finger with a gauze dressing.* If the burns involve the fingers, make a series of half-hoops back and front till the swelling subsides. With this precaution one can even treat third-degree burns in babies. A recent case of palmar burns down to the flexor tendons in a child of 2 who grasped the element of an electric fire gave us complete healing and function in two months.

Lastly, since using this method I have not had to resort to skin grafting. But there is no reason why in a sufficiently extensive raw area both methods should not be combined. I do not think the skin graft would mind.

Walmer. JAMES S. HALL.

APPLICATION FOR HOSPITAL POST

SIR,—It is in the backwash of an emotion compounded of anger and confusion that I address this letter of inquiry to you. What is the policy adopted in the selection of candidates for interview and eventually for appointment to a post advertised in this journal?

I applied two weeks ago for such a post at a well-known hospital near one of our university towns. I received no acknowledgment of my application, and it was only from a chance remark of a friend that I learned that the interview was today. Having made an exhaustive search to find a mislaid letter, I went to the trouble and expense of telephoning the hospital. Believe it or not, the secretary was angry with *me* for inquiring about my application, and quite furious when I asked him how candidates were selected for interview, telling me that it was none of my business and a hospital affair. May I register my protest here? It is my business, and should be a public affair. He finally apologised for not sending a letter of acknowledgment. This was due to an oversight, though it leaves me in some doubt whether my application ever received any attention. It would seem that more tact and consideration are applied in obtaining the services of a cook than those of a doctor.

To most of your readers, this issue is one which they have forgotten, though at some time most of them must have had some similar experience. Heaven knows how much preselection and wire-pulling contribute to an eventual appointment; it was ever so, and I suppose always will be. But is it not farcical widely to advertise a post when the record of appointments to a hospital shows that those chosen are almost always students from the nearby university town?

In England Now

A Running Commentary by Peripatetic Correspondents

AFTER his talk to the Eugenics Society last week[1] Mr. Cecil Binney should have spent the next evening at the Torch Theatre and blushed for his shortcomings. In Mr. Dan Sutherland's *Breach of Marriage* he would have seen an eminent lawyer who—without any trial run, with no chance to consult a single text or ring up a knowing colleague, and moreover with none of that tiresome legal caution which Mr. Binney displayed —was able to rattle off all the relevant opinions on artificial insemination at a moment's notice; and this, too, when he was rattled himself, having just been told that his coming grandchild was to be what some have called a test-tube baby.

On the whole he took it well; though one of the curious things about this play is that no-one can be sure how anyone is going to take anything. Certainly they have a good deal to take. There is Peter Stuart, the war hero, for example, paralysed "from the waist down" as result of frostbite. This obscure condition does not debar him from having a child, though it requires the intervention of a third party. He is alleged to be going crazy in his desire to achieve this feat; but all the poor fellow betrayed was a very moderate snarkiness with his wife and in-laws—a touch of veteran's rage, perhaps invited by their aggressive forbearance. Well, but then he turns out to have pulmonary tuberculosis, diagnosed in the course of the afternoon by the clever doctor, Erasmus Baring, who happens to know a bit about tuberculosis, he tells us; and so he must, for he spots a minimal lesion without an X ray, and mainly on the basis of a positive Mantoux test. He is weak on modern treatment, though, and shockingly hazy about the dangers of infection for the child. Never mind, the play must go on, rather better than expected. Peter must not be told about his tuberculosis, which (if he were to be the donor himself) might be passed on to the next generation; but at all costs he must be given a child; so the wife plumps for A.I.D. and Peter must never know about that either. But of course he finds out, and like the audience at once engages in the pastime of spotting the donor; as there is only one candidate it doesn't take anybody long. So the war hero, after a last well-ridden row with his wife, wheels himself over the cliff, as we all knew he would the moment we heard there were cliffs in the vicinity.

What, I wonder, was Mr. Sutherland out to say? He gives the doctor every sympathetic consideration and most of the best lines, which suggests a liberal attitude to artificial insemination. On the other hand, the whole affair turned out very badly, and ought to be a lesson to somebody. It is hard to detect exactly whom. But there, as Mr. Binney might say, perhaps it will never happen.

* * *

My peripatetic colleague of Oct. 16 who suffers so severely over his winter pants might obtain the appropriate regulation of clothing without so much heart-searching by the use of an overcoat, and there is a tradition in the Eastern Counties that overcoats should be looked out at the time of Barnet fair. This fair, which is now a ghost of its former self both in size and importance, is held on Sept. 3, 4, and 5, except when one of these days is a Sunday.

* * *

Should a doctor tell? And, if so, how much? The old question came up again the other day. Miss O, a woman of 55, has been under the care of our partnership for 6 years with spasticity due to disseminated sclerosis. We have told her that her trouble is "neuritis" (convenient blanket-word!) and encouraged her to continue at work, and she does quite well with a little morning amphetamine to get her going.

A few weeks ago she was staying in a provincial town and fell sick. On her return she told me that the doctor, a young and enthusiastic physician, examined her thoroughly and warned her that she had a serious disease which would develop over a long period and ultimately paralyse her; it was called Parkinson's disease. I deduced that the doctor had probab diagnosed her correctly but was not quite at home wi the nomenclature. Anyway, it gave me a loophole, a I assured her that she had not Parkinson's disease, a that, though we might give her trouble a long latin nam "neuritis" would do quite well, and that she need n worry for the future.

Twenty years ago I might have been less subt. And then when she heard the name "disseminat sclerosis" she would have looked it up in the *Compl Home Doctor* and become a very unhappy and perha needlessly apprehensive woman. I once saw a wom in the fifties who had recently developed a typ spasticity and incoördination having had no sympto whatever since her original attack of diplopia at t age of 20. That helped to teach me not to darken t lives of my patients with dire prophecies.

It is more difficult to know when to tell in cases approaching death. I think I should like to know if had an inoperable cancer or an acute leukæmia, b I don't think this would be true of most people. O gets the "feel" of patients, whether they want the tru or not. Usually it is best to await their approach, a often the form of question helps to determine the answ One of my best patients and friends—an intellige inquisitive, and humorous old man—asked me single question about his trouble during a long illn with an inoperable bowel cancer. Sometimes the ne relatives can help, but usually it has to lie betwe doctor and patient. A dear old lady of 80 said "T me, doctor, I'm not afraid"; and so I told her, and the many months she lingered on she always had a sm and usually a joke. But for many others the truth wo have been mental torture.

And with Pilate one may ask, "What is truth At the best we can only tell some of it, for we never kn the whole.

* * *

Minor swindles on the Government are the fash these days, but here is one which I am assured is be perpetrated and must be among the simplest and saf All you require is a friendly chemist and a busy doct The technique is as follows: Go to the doctor's even surgery; you will probably be one of 100-odd patie there. Complain of a "cough" or a "lump in t throat," or anything which takes your fancy and does sound too alarming. The doctor may or may not exam you but at any rate he will give you a prescri Take the prescription to your friend the chemist and [illegible] it with him for some toothpaste, hair oil, or cosm for your lady friend. If you want some more, simply on attending the busy evening surgeries. Always say th the last prescription did you good, and you will certai have it repeated. There's no end to it.

* * *

Your provincial and peripatetic psychiatrist h recently been asking his colleagues in London and New York: "How do you practise psychiatry in t great wen, this monster, called the Metropolis, anywa When I see a patient in my home town, I can visuali the street he lives in, the school he went to, the facto he works in. I probably know his family doctor—or h probation officer—personally. A good rapport m exist because I have already treated his cousin or h next-door neighbour. After he goes back to work can attend as an outpatient shortly after 5 o'clo without any inconvenience to anyone. There's soci psychiatry for you." The metropolitan psychiatris have their answers. They point to their retinues social workers and their piles of reports from soci service agencies. They too have faithful patients wh travel 20 miles to the hospital if they move out to t suburbs. They too can visualise their city district even the non-peripatetic reader may understand t connotations of "Lower East Side" and "Harlem and of "Fifth Avenue" and "Park Avenue."

* * *

We are becoming inured to jargon these days, bu I was somewhat startled when my youthful secretar asked me to sign a letter I had dictated to a docto about a woman patient, recommending ". . . extr rest, absenteeism from intercourse, and careful regulati of the bowels. . . ."

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[1] See p. 738.

was there." Such elimination was in fact proved. accepted that the normal intestinal flora is essential health; and this flora is profoundly disturbed under influence of chemotherapy and antibiotics. Intestinal urbances, sometimes serious in children, often seem occur during the period of relative sterility of the canal. earch on this problem might well lead to interesting clinically useful conclusions.

al Infirmary, Sunderland. D. ASTLEY SANFORD.

DENTURES AND ANÆSTHESIA

SIR,—Are there not two simple ways of obtaining tight fit for edentulous patients, which do not require cial apparatus or expose dentures to risk of fracture? swab of normal theatre size packed into each cheek und the airway or tube (unless the nasal air passage assured) will bring the face to a good round contour. which a face mask fits well. A really large face-piece the old conical, unmoulded type will "sit" so far out the face that the edentulous collapse is usually ed, and a good fit is far more likely than with any the patterns of small mask. Unfortunately these large ks are now difficult to buy. The principle of fitting bony margin of the face is the same as Mr. Phillips plying with his inhaler.

E.11. J. BARNARD.

CRISIS ON QUALIFICATION

SIR,—The annotation entitled The Prentice Practice in your issue of Oct. 23 has aroused considerable rest among some who hope shortly to be the object the arrangements proposed by the Minister of Health. writers of this letter are students of a London ital who have had their medical studies interrupted six or more years of war service and feel considerable cern over that part of their training which will begin n as they qualify.

In the next twelve months a considerable number of Service students will be finishing their undergraduate es at the various medical schools and colleges: the following year this class of students will amount ut half the total qualifying. Still another year e proportion will be even higher. The average ex-Service students on qualification is, or will be, 30. It is realised that in a few years, although ll ex-Service element may remain because of iption, the age will be considerably less. Owing ir age, this present group (a result of the recent has certain problems which deserve consideration such schemes as the present one are worked out. y of these students are married and have children; although the Ministry of Education is paying tenance grants to most of them, nearly all of them suffering real financial hardship, as their gratuities savings are soon exhausted. On qualification these ts cease abruptly, so that, unless some measures instigated in the immediate future, very few will able to apply for house-appointments, which are a essary part of medical training. The present rate of for house-appointments will almost entirely preclude who have a family to feed, clothe, and educate n applying for such appointments. By the simple ideration of averages, the ex-Service group must ain a number of men of ability. Many, too, were ed for, and held positions of, considerable responsiy in various arms of the Services. Surely any such , training, and experience will have its uses in the ssion. It will be regrettable if a certain number men from sheer necessity short-circuit some aspects their training and offer their services to the highest der.

We feel most strongly that the salary for house-ntments should be uniform throughout the country that there should be a definite scale, taking into sideration such factors as age, and number of pendants. The Minister of Education has adopted a ale for students' maintenance on these lines, and the vices, too, pay their personnel in a similar manner.

After house-appointments, those of us entering general ractice will welcome the latest suggestion for further aining under experienced general practitioners. With regard to the salary mentioned by you and to which the Insurance Acts Committee has objected, we feel that this is not, in all conscience, too liberal. The principal will have, as you point out, fully qualified, enthusiastic assistance and all that this means to someone who must be feeling the effects of a life of unstinted labour. From the assistant's point of view, he will almost certainly have to take temporary furnished accommodation for his family, which alone will cost him at least five guineas a week. (We know, we have had to pay it.)

These are hard facts and not flights of fancy which we have put in this letter. We appreciate that it is easy to criticise and difficult to construct, but we hope that by raising these problems we may enable the highest standards in medicine to be maintained by ensuring that the newest members of the profession may follow the excellent paths which have been, and are being, laid down for them.

J. M. BROWN
W. A. BULLEN
G. DOUGAN
I. F. G. MCLANNAHAN
J. F. TRUNCHION.

RETURN TO PHILANTHROPY

SIR,—In last week's leading article, is the sharp antithesis between "the enthusiastic gatherings of the hospital contributory schemes of a decade ago" and the meetings of a regional board quite justified by the structure of the new organisation? The contact with the people is through the management committees rather than the regional board.

Camberwell provides an example. Ten days ago the mayor presided over a large and representative gathering of voluntary workers in, and friends of, the three hospitals (formerly L.C.C.) of Dulwich, St. Francis, and St. Giles. Mr. Lesser, chairman of the Hospital Saving Association, accompanied by many of the local group secretaries, spoke in advocacy of the formation of the Camberwell Hospitals Fellowship, which was constituted by those present. The fellowship will be formed by various groups and friends of the hospitals. Patients will be the first group, under the guidance of the Vicar of Camberwell, who has been a patient. Librarians, who are already doing excellent work for the patients and other voluntary workers in various capacities, will elect their representatives to form, with representatives of the patients, the governing council of the fellowship. Thus there will be a representative organisation to which the management committee can render an account of their stewardship annually. As patients will have a preponderant voice it will represent the "consumer interest" which can only be found with much difficulty in other public-service undertakings.

C. E. A. BEDWELL
Chairman,
Camberwell Hospitals Management Committee.
Dulwich Hospital, London, S.E.22.

Public Health

Mobile Dental and Medical Units

PROMPTED by the unsuitability of some of the existing temporary dental clinics, Kent County Council's primary-education and welfare subcommittee has recommended that a mobile clinic should be provided for the school health service in country districts. The units, of which there are likely to be three, will be drawn in turn by a single "mechanical horse." The trailer portion will contain a waiting-room, surgery, and recovery room, and will have its own X-ray apparatus and electrical system. Where a mains supply is unobtainable, water will be drawn from built-in tanks.

The *Empire News* (Oct. 24) reports that a travelling surgery will soon be operating in the rural district of New Earswick, Yorkshire. A caravan, drawn by a shooting-brake, will be partitioned into a reception room, a consulting-room, and two small dressing-rooms. The surgery is being sent out by the Rowntree Village Trust with the backing of the Ministry of Health; and if it is successful further units of the same sort may be introduced.

Furthermore, what is meant by the phrase "Required—house-physician, A or B2"? Does it mean that this is a first appointment open to newly qualified practitioners, unless an ex-Serviceman or registrar with an M.R.C.P. cares to apply? Or, more charitably, does it mean that a post normally of B2 status is found difficult to fill and offered to A practitioners?

To many, I said, this issue is dead. To me, and to many other newly qualified men, it is very much alive.

A. B.

BLOOD FOR TRANSFUSION

SIR,—In view of the recent correspondence and last week's leading article on this subject, I think it is worth recording that recently we obtained 30 pints of group-O blood from the North London Blood Transfusion Depot for the purpose of exsanguination transfusion. We are particularly indebted to the director of this unit for his help in supplying this large quantity at short notice.

St. Bartholomew's Hospital, London, E.C.1.
I. P. MACDOUGALL
Chief Assistant.

NITROUS OXIDE SUPPLIED BY PRACTITIONERS IN MIDWIFERY SERVICE

SIR,—There appears to be confusion about the supply to general practitioners of cylinders of nitrous-oxide gas for analgesic purposes in maternity cases under the National Health Service. As the National Birthday Trust is particularly interested in the provision of analgesia to women confined in their own homes, approach was made to the Ministry of Health for guidance in the matter; and the following is from the Ministry's reply:

"The position is that if a doctor is engaged by the patient to give maternity medical service under part IV of the Act, he is in the same position as any doctor giving general medical service under part IV. He may write prescriptions or may himself supply any drug 'personally administered'—e.g., nitrous oxide. For drugs so supplied he will receive payment from the executive council on presentation of a claim on E.C.10 to the executive council.

"If the doctor is called in by a midwife in emergency, he is not giving maternity medical service under part IV of the National Health Service Act but is giving services under the Midwives Act, 1918. He receives a fee which includes the supply of necessary drugs and dressings, except that he gets extra payment for certain expensive drugs named in part 2 of the schedule to S.I. 1463 of 1948. In such cases, the patient would have a midwife in attendance and, as you know, midwives are supplied by the local health authority with cylinders of nitrous oxide. Many, but not all, doctors have cylinders but some may not have realised that when giving maternity service under part IV they can be paid for any nitrous oxide they supply themselves."

D. V. RIDDICK
57, Lower Belgrave Street, London, S.W.1.
Secretary, National Birthday Trust Fund.

MEDICAL RESEARCH IN AFRICA

SIR,—I am very glad that your correspondent of Oct. 16 (p. 624) has called attention to the attitude (or lack of it) of the Colonial Office to the immense medical problems of Africa. I note that he makes no reference to venereal diseases, but in this respect the official attitude seems to be much the same as in others.

During 1944 and 1945, as Command venereologist and dermatologist to the British Army in East Africa, I devoted fifteen months to the study of the special problems of venereal diseases in these territories. The war saw an enormous increase in the incidence of venereal diseases in East Africa, and at the same time provided means by which that increase was likely to go on. In this respect the V.D. problem has an urgency not presented by such a condition as malnutrition, which was presumably not changed very much in recent years. It is also comparatively remediable; yaws has been virtually "stamped out" in many districts, and comparable medical "campaigns" on a larger scale would do much to control the spread of venereal diseases.

Three times since the end of the war have I tried to induce the Colonial Office to show an interest in the problem. I have submitted a survey of some 3000 words, called twice at the Colonial Office, and written letters; but I have never detected any spark of real interest. My correspondents in Kenya are still unable to
tell me of any material steps which have been ta
cope with the situation in that country.

No doubt, as your correspondent says, ther
shortage of personnel to do the work; but I a
satisfied that this is the reason why so little ha
done. The official mind does not seem to be ap
at so many tasks and so few people to carry ther
its attitude more resembles indifference, which ca
result from a lack of appreciation of the importa
the work or from apathy. So long, of course, as
the attitude of Whitehall the field workers of the C
Medical Service will be frustrated in their work
if they are good doctors, many of them will lea
service as soon as they can.

Meanwhile, what of our trusteeship of the Afr

London, W.1.
F. R. BETT

UNDER TENSION

SIR,—In his letter on Oct. 23, Dr. West insi
that because I admit the obvious fact that the Mu
rulers wish to destroy non-Communist States, I
therefore be a warmonger intent on a preventi
against the U.S.S.R. This is a very serious c
which I deny. In everyday life, a man who is thre
by a homicidal paranoiac neither reflects, while av
the mortal stroke, that it takes all sorts to make a
nor decides to murder him first. He does the com
sense thing. If he lives in an ordered and p
State, he calls on the police to protect him, a
no doubt hopes that psychiatrists will cure the par
of his mental aberration in due course. If, c
other hand, he lives in a State without police
courts, or psychiatrists, he collects trusted friend
fortifies his house.

This is my logical counter to Muscovite threa
am fortunately able to answer Dr. West's whi
question about what voices are to be heard in the U.
In the Stalin-Tito exchanges, Stalin writes that th
that there can be "peaceful development of cap
elements alongside Socialism is a rotten and oppor
theory." Stalin also said, in the same Tito-Comi
controversy: "Communist parties can live and de
only in open warfare against the enemies of
munism." Dr. West's counter to these bloodt
threats seems to be that no-one is really to blam
that it will all be the same in 40 years. Very whi
very. A mighty droll and fantastical fellow, 'po
word.

Bridlington.
P. D. H. CHAP

STAPHYLOCOCCAL ENTERITIS DURING STREPTOMYCIN THERAPY

SIR,—At the end of the case-report admi
presented by Mr. Kramer on Oct. 23, I was surpris
find in the summary the suggestion that "the
aureus, already present elsewhere in the body,
rendered streptomycin-resistant by the small amou
the drug absorbed from the gut."

In the absence of proven facts the subject is on
speculation; but it is of great clinical import
My experience is limited to penicillin, about
similar suggestions are frequently made. I find
larly after giving normal dosage of penicillin for 2
days in proper cases and failing to obtain improve
that a characteristic defervescence by crisis is obt
by doubling or quadrupling the dose. I would su
that clinical experience in this and other ways is ag
the theory of education of a bacterial strain to imm
to penicillin.

By an interesting coincidence, in the same numb
THE LANCET Dr. Barber and Dr. Rozwadow
Dowzenko find "that it has not so far been possib
train a staphylococcus in vitro to destroy penicil
Furthermore, in Mr. Kramer's case, the staphyloc
causing conjunctivitis was present on the face and
therefore being ingested before penicillin or streptom
was administered. Why then did it not cause the
enteritis at that stage? Is it suggested that small
of streptomycin not only produced insensitivity to
drug but enhanced the virulence?

I believe Mr. Kramer's second suggestion to be near
truth—"that elimination of the normal intestinal
may have contributed to the establishment of the staph

ccus there." Such elimination was in fact proved. is accepted that the normal intestinal flora is essential o health; and this flora is profoundly disturbed under influence of chemotherapy and antibiotics. Intestinal turbances, sometimes serious in children, often seem occur during the period of relative sterility of the canal. earch on this problem might well lead to interesting clinically useful conclusions.

oyal Infirmary, Sunderland. D. ASTLEY SANFORD.

DENTURES AND ANÆSTHESIA

SIR,—Are there not two simple ways of obtaining tight fit for edentulous patients, which do not require ecial apparatus or expose dentures to risk of fracture? swab of normal theatre size packed into each cheek ound the airway or tube (unless the nasal air passage ensured) will bring the face to a good round contour, which a face mask fits well. A really large face-piece the old conical, unmoulded type will "sit" so far out the face that the edentulous collapse is usually oided, and a good fit is far more likely than with any the patterns of small mask. Unfortunately these large ks are now difficult to buy. The principle of fitting bony margin of the face is the same as Mr. Phillips pplying with his inhaler.

ndon, E.11. J. BARNARD.

CRISIS ON QUALIFICATION

SIR,—The annotation entitled The Prentice Practiner in your issue of Oct. 23 has aroused considerable erest among some who hope shortly to be the object the arrangements proposed by the Minister of Health. e writers of this letter are students of a London pital who have had their medical studies interrupted six or more years of war service and feel considerable cern over that part of their training which will begin soon as they qualify.

In the next twelve months a considerable number of -Service students will be finishing their undergraduate es at the various medical schools and colleges; the following year this class of students will amount out half the total qualifying. Still another year he proportion will be even higher. The average ex-Service students on qualification is, or will be, 30. It is realised that in a few years, although all ex-Service element may remain because of cription, the age will be considerably less. Owing heir age, this present group (a result of the recent) has certain problems which deserve consideration n such schemes as the present one are worked out.

any of these students are married and have children; , although the Ministry of Education is paying intenance grants to most of them, nearly all of them suffering real financial hardship, as their gratuities savings are soon exhausted. On qualification these nts cease abruptly, so that, unless some measures instigated in the immediate future, very few will able to apply for house-appointments, which are a cessary part of medical training. The present rate of r for house-appointments will almost entirely preclude e who have a family to feed, clothe, and educate n applying for such appointments. By the simple sideration of averages, the ex-Service group must tain a number of men of ability. Many, too, were ned for, and held positions of, considerable responsility in various arms of the Services. Surely any such ility, training, and experience will have its uses in the ofession. It will be regrettable if a certain number men from sheer necessity short-circuit some aspects their training and offer their services to the highest lder.

We feel most strongly that the salary for houseppointments should be uniform throughout the country d that there should be a definite scale, taking into nsideration such factors as age, and number of pendants. The Minister of Education has adopted a ale for students' maintenance on these lines, and the ervices, too, pay their personnel in a similar manner.

After house-appointments, those of us entering general actice will welcome the latest suggestion for further ining under experienced general practitioners. With regard to the salary mentioned by you and to which the Insurance Acts Committee has objected, we feel that this is not, in all conscience, too liberal. The principal will have, as you point out, fully qualified, enthusiastic assistance and all that this means to someone who must be feeling the effects of a life of unstinted labour. From the assistant's point of view, he will almost certainly have to take temporary furnished accommodation for his family, which alone will cost him at least five guineas a week. (We know, we have had to pay it.)

These are hard facts and not flights of fancy which we have put in this letter. We appreciate that it is easy to criticise and difficult to construct, but we hope that by raising these problems we may enable the highest standards in medicine to be maintained by ensuring that the newest members of the profession may follow the excellent paths which have been, and are being, laid down for them.

J. M. BROWN
W. A. BULLEN
G. DOUGAN
I. F. G. MCLANNAHAN
J. F. TRUNCHION.

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Obituary

CHARLES MORLEY WENYON

C.M.G., C.B.E., M.B., B.SC. LOND., F.R.S.

Dr. C. M. Wenyon, who died in London on Oct. 24, was one of the greatest authorities on medical protozoology. He was born at Liverpool on March 24, 1878, but spent most of his childhood in China, where his father, Charles Wenyon, was a pioneer medical missionary. At the age of 14 he was sent back to England to be educated at Kingswood School, Bath. Later he went to Leeds University, and then to London where he studied at University College and Guy's Hospital, graduating as B.SC., with protozoology as a special subject, in 1901, and M.B. in 1904.

In 1905 he was appointed to the first post of lecturer in protozoology at the London School of Tropical Medicine, where he worked under Patrick Manson. In the years that followed he continued his studies in protozoology at Munich and in Paris, and collaborated with the late Sir Andrew Balfour at the Wellcome Tropical Laboratories in Khartoum. He also undertook a number of scientific expeditions to Africa and the Near East: working in a floating laboratory on the Nile, he investigated protozoal diseases in the Sudan, and later he studied leishmaniasis in Bagdad, Aleppo, and Malta. On his return to England in 1914, he was appointed director of research in the tropics to the Wellcome Bureau of Scientific Research. During the war of 1914–18 he conducted classes in protozoology for Army medical officers, and as a member of the Medical Advisory Committee in the Near East visited Egypt, India, and Mesopotamia, where he worked on amœbic dysentery and other protozoal infections. He was subsequently appointed consultant in malaria with the British Salonika Force, and after the war became consulting pathologist to the Army of the Black Sea. He came back to England in 1920, and in 1924 succeeded Sir Andrew Balfour as director-in-chief of the Wellcome Bureau of Scientific Research, later becoming director of research in the Wellcome Foundation—a post which he held until 1944. On retiring from the directorate he maintained his connexion with the foundation as consultant in tropical medicine.

Wenyon's scientific activities, lasting half a century, were not restricted to the purely medical sphere. In fact his name has left an imprint on our knowledge of every group of parasitic protozoa in man and the lower animals. Before the first world war medical protozoology hardly existed, but at the beginning of the second war the relative medical importance of the different human protozoal parasites was fully established. This achievement was due largely to the pioneer work of Wenyon. In Egypt he examined the incidence of amœbiasis and other intestinal protozoal infections, with special reference to carriers of *Entamœba histolytica* and the epidemiology of amœbiasis. Much of our understanding of the intestinal flagellates and their relation to man is due to his investigations. Of the five species now known to parasitise man, two (embadomonas and chilomastix) were discovered by him. These investigations were brought together by Wenyon and O'Connor in a book on *Human Intestinal Protozoa in the Near East* (1917). Wenyon was the first to describe the exogenous development of the human coccidium, which he named *Isospora belli*, and his subsequent researches on the coccidia of dogs and cats brought order out of our confused knowledge of these parasites. He was the first to establish the coprozoic nature of certain amœbæ and flagellates found in human stools and often mistaken for genuine human parasites. He made important contributions to our knowledge of the leishmanias and trypanosomes and the diseases caused by them. He revised the classificat of the Trypanosomidæ and described their cytolo while his work in the Mediterranean area served elucidate the epidemiology, course of infection, diagnosis of the leishmaniases; he was the first to leptomonad flagellates in the sandfly. While work in Macedonia, he made valuable investigations on mala dealing with its epidemiology, transmission, and tr ment, and with mosquito suppression. His experime studies on the development of malaria parasites mosquitoes at low temperatures served to elucid the behaviour of the parasite in the hibernating ve and to account for the occurrence of outbreaks of mal in the spring.

The most important single work published by Wen is his *Protozoology*—a treatise of two volumes, profu illustrated, which appeared in 1926. This work gi the most complete account of all parasitic proto of medical, veterinary, and general parasitolog importance. Unlike most textbooks, it synthes knowledge of the subject and reflects the auth erudition and vast practical experience.

Not the least of Wenyon's achievements was development of the Wellcome Bureau of Scient Research (now the Wellcome Lab tories of Tropical Medicine) fr a modest information centre t scientific institute with an in national reputation, in which fun mental research in parasitology tropical medicine is carried out.

As editor of the *Kala-Azar Bull* and subsequently sectional ed of the *Tropical Diseases Bull* during the last 36 years Wen contributed authoritative criti reviews of world literature on lei maniasis and other protozoal disea He was hon. secretary of the Ro Society of Tropical Medicine a Hygiene from 1920 till his electi as president in 1945. For a quar of a century he was the guiding sp of the society, which has risen to present position largely through energy and perseverance. He w also instrumental in making t society's *Transactions* an importa medical journal of internatio standing. As a person, he w ever ready to help others with his advice, whi was sought by workers all over the world. He w essentially modest and tolerant, and to colleagues und him he was *primus inter pares*.

Wenyon's work was recognised by many awards a honours. For his services in the first world war he was appoint C.M.G. and C.B.E.; in 1927 he was elected a fellow of t Royal Society; in 1933 he became officier de la Légi d'Honneur; in 1945 he was elected hon. life member of t New York Academy of Sciences; in 1946 he was awarded t Theobald Smith gold medal of the American Academy Tropical Medicine; and last year he was elected hon. fell of the Royal Society of Medicine and was awarded the Mans medal of the Royal Society of Tropical Medicine and Hygie

C.A.H.

To his colleagues Wenyon was more than a prot zoologist; he was a great leader in the affairs of men, a there are many who relied upon his sane pronouncemen and his wisdom. It was a sad day when, some 34 yea ago, he decided to leave the London School of Tropic Medicine with which he had been connected for t 10 previous years. In that comparatively short time h had established his department on a firm basis and ha contributed very substantially to the fame and prestig of this school. In my judgment his most solid contr bution was to the Royal Society of Tropical Medicine he founded Manson House as the home of what he forge as a great society. Wenyon will always be remember as its architect. His management of the society' *Transactions* made of them a journal of the highes order.

No-one could have preserved a more friendly outlook his colleagues and to those around him, however ble. He refused to be led into intrigues or entangled quarrels. He was a very brave man. The qualities courage and endurance he showed on many occasions ing the first world war, and in a high measure during long and painful years which preceded his death.

P. M.-B.

The obscurities of protozoal life-cycles produced a siderable literature of controversy and some false rts. Dr. Wenyon was indefatigable in his endeavours keep the main path open, and he entered the polemic na with a conscientious gusto reminiscent of his sionary origin. If one told him that these confusions uld settle themselves in the course of time he would tly maintain that error was dangerous and should be allowed to go uncorrected. He had an obstinate e that things should not be let go by default. There something realistic and practical in his approach the scientific problems that occupied him and his temporaries, and he did not take much interest in t he considered to be theoretical hair-splitting and e or doctrinaire speculation. Indeed sometimes he ed to inhibit his own advance by this sceptical turn his mind. He was a generous and encouraging fellow-ker, and had a robust and unspectacular friendliness t endeared him to those who knew him well.

M. R.

Wenyon had a great personality. He was entirely ffected and utterly honest, without a trace of cant or llectual snobbery. Even the chance encounter with never failed to warm and illuminate the day; ybe he would be jauntily swinging along the street, en with an old walking-stick; maybe he would be his laboratory or at some meeting or social function: always he could make time for a few moments' t to relate some experience or to make some shrewd ment that sent one on one's way refreshed, stimu-ed, and informed. Always was he willing to discuss blems, to examine specimens or material, and help who sought his never-failing aid; but much of his was not fully realised even by those who benefited from it. For example, he gave untold hours to correcting, and polishing manuscripts submitted experienced and meticulous authors to the *ctions* of the Royal Society of Tropical Medicine Hygiene, and other journals with which he was emed; and many writers and countless readers owe than they know to his advice and labour.

have never heard a single person make an unkind ment concerning him—a measure of affection and timony to real greatness. F. M.

ALBERT EDWIN HAYWARD PINCH

M.D. BRIST., F.R.C.S., M.R.C.P., D.M.R.E.

Mr. Hayward Pinch, who died at Bideford on Oct. 14 the age of 81, was the first medical superintendent of Radium Institute, London, a post which he held for years.

He received his medical education at Bristol and St. tholomew's Hospital, taking the Conjoint qualifica-in 1894. At Bristol he had been first entrance lar and he also held the Suple and Clarke scholarships, he later became an assistant lecturer in physiology Bristol University College. At the Army Medical ege, to which he went after receiving a commission the Indian Medical Service, he continued to carry off rds and received in turn the Fayrer, De Chaumont, Montefiore prizes, and the Herbert scholarship. 1896 he took his F.R.C.S., and he served for a period a surgeon specialist in Bengal. After returning to s country he held the posts of superintendent and turer in pathology at the London Medical Graduate ege and Polyclinic and pathologist to the Alexandra spital for Children with Hip Disease. But he became re and more interested in the new specialty of radio-rapy, and Sir Frederick Treves, who was the first sident of the Radium Institute, persuaded him to cept the appointment of medical superintendent there 1909. Thus he became the first whole-time research nician in the specialty. His annual reports of the work of the institute were more than records of successful achievement: they were also guides in brief to contemporary advances in the treatment of disease with radioactive matter. Cautious in his assessment of results and alive to the dangers of the new technique, he characteristically ended an address to the Medical Society of London with Talleyrand's words: *Pas trop de zèle.* His *Clinical Index of Radium Therapy* appeared in 1925 and *Superficial Radium Therapy* two years later. He was also the author of a *Manual of Technique in Radium Therapy.*

When the work of the institute was reorganised in 1930 on its affiliation with the Mount Vernon Hospital, Mr. Pinch, whose health was poor, felt unable to undertake the additional burden. The committee appointed him consulting surgeon to the institute in appreciation of his services during his long tenure of office. He spent his retirement happily in his native West Country, and a colleague writes: "He was full of abounding vitality, and despite exalted Harley Street prognosis. the invalid survived for 18 years. Kind and generous, he was a sound clinician, especially good on eyes. Golf was one of his enthusiasms, and he was also a keen salmon fisher and a lover of Deeside where he spent a month every year."

THE LATE SIR BRUCE BRUCE-PORTER

L. K. writes: "As perhaps his oldest friend I may be allowed to mourn, with many hundreds, the passing of B.-P. His vital principle was his vivid and brilliant enthusiasm for that which he believed to be right, thus he harnessed his dream of helping others to the chariot of practical endeavour. His chief characteristics were his whole-hearted devotion to his patients, regardless of all personal consideration of leisure or fatigue, and his contagious optimism. Never idle, he was always willing to help anyone over a stile and to take infinite trouble in so doing. He bore the last six months of suffering with fortitude and grace, until 'out of the stress of the doing, he has passed into the peace of the done.'"

Births, Marriages, and Deaths

BIRTHS

BLANSHARD.—On Oct. 24, in London, the wife of Dr. Paul Blanshard—a son.

BRAINES.—On Oct. 28, in Jersey, the wife of Dr. F. M. Braines—a son.

BRAND.—On Oct. 22, at Vellore, India, the wife of Mr. Paul Brand, F.R.C.S.—a daughter.

ELLIOTT.—On Oct. 24, at Reading, to Dr. Katherine Elliott, wife of Mr. A. M. Elliott—a daughter.

HOLMES.—On Oct. 25, at Edgware, the wife of Dr. S. W. Holmes—a son.

JONES.—On Oct. 29, at Morden, the wife of Dr. G. Lewis Jones—a daughter.

KELLY.—On Oct. 28, at Cheam, the wife of Mr. Patrick Kelly, F.R.C.S.—a daughter.

LOGIE.—On Oct. 26, at Aberdeen, the wife of Mr. N. J. Logie, F.R.C.S.—a daughter.

LOW.—On Oct. 26, the wife of Dr. M. G. Low—a son.

MASON.—On Oct. 13, the wife of Dr. H. A. C. Mason—a daughter.

NICHOLSON.—On Oct. 30, at Harrogate, the wife of Dr. B. Clive Nicholson—a son.

RICHARDS.—On Oct. 20, at Tripoli, the wife of Major H. J. A. Richards, R.A.M.C.—a daughter.

SCOTT.—On Oct. 25, in London, the wife of Dr. Oliver Scott—a daughter.

WHITTAKER.—On Oct. 24, to Dr. Margaret Morgans, wife of Dr. Norman Whittaker—a son.

MARRIAGES

FAIRBURN—NICHOLSON.—On Oct. 23, at Bangor, co. Down, Ernest Alfred Fairburn, M.D., to Margret Isabel Nicholson.

HUNT—HALEY.—On Oct. 29, at Hampton, Middlesex, Jack Naylor Hunt, M.B., to Anne-Claire Haley.

DEATHS

BREWS.—On Oct. 28, in London, Richard Vincent Brews, J.P., L.R.C.P.I.

BRIND.—On Oct. 23, at Gorran Haven, Cornwall, Harry Hanslow Brind, M.R.C.S., D.P.H.

BULLMORE.—On Oct. 29, in London, Edward Augustus Bullmore, F.R.C.S.E., aged 73.

GROSSART.—On Oct. 23, Robert Kerr Grossart, M.B. Glasg., D.P.M.

MACKINNON.—On Oct. 25, in London, Donald Mackinnon, M.B. Glasg.

MITCHELL.—On Oct. 26, at Bexhill, Ernest John Drum Mitchell, M.A., M.B. Camb.

PATERSON.—On Oct. 22, at Millbrook, near Plymouth, Alexander Cowie Paterson, M.B. Aberd., D.P.H.

WENYON.—On Oct. 24, 1948, in London, Charles Morley Wenyon, C.M.G., C.B.E., M.B., B.SC. Lond., F.R.S.

Parliament

The New Session

On Oct. 26 the King opened the new session with the full splendour of ceremonial which has been in abeyance since 1938. The main legislative proposal mentioned in the Gracious Speech was, of course, the controversial Bill to nationalise sections of the iron and steel industry, but other useful and important measures foreshadowed included a Bill to establish national parks, and improvement of the law relating to footpaths and access to the countryside as well as the better conservation of wild life. A housing Bill will provide for the improvement of existing dwellings by local authorities or private owners.

No mention was made of the promised Bill to amend the National Health Service Act to meet points raised by the medical profession, but it is expected that this matter will also be dealt with during the current session. Legislation is promised modifying the constitution and powers of the General Nursing Council and to provide for the better training of nurses. This measure will follow the recommendations of the Working Party's majority report that nurses in training should have full student status, a shorter but wider training, and a 40-hour five-day training week, and that the council should be reconstituted.

To secure the supply of safer milk a Bill will be introduced compelling retailers in certain areas to sell milk of a required quality; but the pace at which this measure can be implemented will depend on how soon pasteurisation plant can be provided.

Debate on the Address

In the debate on the Address in the House of Lords on Oct. 27 Viscount SAMUEL hoped that the Government would give speedy attention to Lord Beveridge's recent report on voluntary agencies, and Viscount HALL, on behalf of the Government, agreed that this report was well worth examining. Reviewing the legislative programme of the past three years, the noble Viscount said that the new social insurance schemes were well on their way, and benefits were beginning to be realised by the people. The same thing might be said of the Health Service, for already there was abundant evidence that the scheme was working smoothly. The many prophecies of its breakdown had proved to be wrong, for over 90 % of the population had chosen doctors, and doctors had agreed to accept them.

Lord ELTON, supporting the plea for national unity in view of the international situation, suggested that a Government might shrink from some unpopular course if the consequent odium was likely to fall on it alone, and a Government which faced difficulties realistically might well be compelled to consider not "guns before butter," but at least "guns before orange juice and free spectacles." When that time came it might be easier for Ministers to take the steps which they themselves judged necessary, not by way of conflict but by way of national coöperation.

QUESTION TIME

Spectacles and Prescriptions (Cost)

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health what was the cost to date of the provision of spectacles and pharmaceutical benefits, including medical prescriptions, and dental services, including the supply of dentures, under the National Health Service Act, 1946.—Mr. ANEURIN BEVAN replied: The actual payments for the provision of spectacles, including fees paid for sight-testing, and for pharmaceutical benefits including medical prescriptions, up to Sept. 30, amounted to £981,951 and £1,905,447 respectively. These figures do not include the provision of spectacles or medicines through the hospital service. The payments for dental treatment amounted to £1,232,057. This figure does not include the cost of dental treatment provided through the hospital service.

Notes and News

SOCIAL AND ECONOMIC RESEARCH

NEARLY two years ago a standing Interdepartmen Committee on Social and Economic Research was establish Mr. George North, LL.D., the Registrar-General, is the chairm and the members, who include Prof. G. A. Clark, M.D., drawn from the academic staffs of the universities and fr Government departments.

In their first report[1] the committee point out that, Governments become increasingly involved in social a economic questions, the administrator within departme has a greater need of the knowledge which social and econo research supplies. Conversely, as the area of Governm activity expands, the outside research-worker beco increasingly dependent upon the factual raw material wh departments collect for their own purposes. The commit are therefore examining the material which depart collect, the extent to which it is or can be made avail and whether there are any fields of statistical or other infor tion in which a change in present methods of collectio treatment might benefit departmental or other resea workers. Subjects on which they give their views incl the preservation of documents (and making their exist known) and the confidentiality of Government informati they believe that information of general social utility sho not be kept confidential unless there is some good reas They are already taking steps to make available to resea libraries papers which, though not confidential, are detailed or too limited in interest to justify publication. of their principal functions, they feel, is to stimulate all fo of collaboration, whether formal or informal, between departments and research *institutions*.

CHRISTMAS SEALS

A HALFPENNY doesn't seem much; yet, by means of h pence the National Association for the Prevention of Tu culosis has carried on its work for nearly 50 years. attractive Christmas seals with the double-barred Red C which are seen on so many letters and parcels at Christmas t have provided most of the association's funds, and abo quarter of a million pounds has been raised in 10 years. money is used to carry on education in the preventio tuberculosis, research, and social welfare work. In 3 y over a million booklets on such subjects as mass radiogr childhood tuberculosis, rehabilitation, and tuberculosis ma have been distributed. Nearly 138,000 copies of the NA *Bulletin*, and more than 58,000 copies of their mag *Health Horizon*, have been issued. Refresher course doctors and social workers have also been arranged. The se for Christmas 1948 are now on sale and can be obtained for per 100 from the Duchess of Portland, chairman, N.A.P. Tavistock House North, Tavistock Square, London, W.C.1.

University of London

Prof. R. W. Scarff has been appointed to the Bland-Sut chair of pathology at the Middlesex Hospital medical sch from Oct. 1. He became reader in morbid anatomy a histology at the school in 1933 and the title of professor conferred upon him in respect of his post in 1946.

The title of professor emeritus has been conferred on Alexander Fleming, F.R.S., professor of bacteriology St. Mary's Hospital since 1928, and on Sir Francis Fra professor of medicine at St. Bartholomew's Hospital (1920- and at the Postgraduate Medical School of London (1934-4

Royal Society of Medicine

At a joint meeting with the Scientific Film Association be held at 1, Wimpole Street, London, W.1, on Monda Nov. 15, at 8 P.M., Dr. Pedro Belou, professor of anatomy the faculty of medical sciences, Buenos Aires, will show films on the Neuraxis.

London School of Hygiene

The following awards have been made to students of th 1947–48 course at the school for the academic diploma public health:

Chadwick prize, Dr. P. M. Elliott; Hecht prize, Dr. G. Ladd and Dr. N. S. Hepburn; Industrial Medical Officers' prize, Dr. P. Elliott and Dr. D. F. Eastcott.

The Duncan medal in the course for the diploma in tropic medicine and hygiene was awarded to Dr. Hing-Yui Mok.

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[1] 1. Cmd. 7537. H.M. Stationery Office. Pp. 15. 4d.

yal College of Physicians of London

At a comitia of the college held on Oct. 28, with Lord the president, in the chair, Dr. J. H. Sheldon, Dr. H. Campbell, Dr. E. R. Cullinan, and Sir Weldon mple-Champneys were elected councillors. Sir Weldon mple-Champneys was appointed Milroy lecturer for his subject being Undulant Fever, a Neglected Problem. e following, having satisfied the censors' board, were ted to the membership:

Anderson, M.B. Sheff., M. W. Arthurton, M.B. Lond., H. S. M.D. Birm., M.D. Vienna, D. W. Barritt, M.B. Lond., R. E. M.D. Manitoba, A. C. Blandy, M.B. Camb., H. J. -Young, M.D. Lond., R. J. K. Brown, M.B. Camb., Campbell, M.B. Camb., C. O. Carter, B.M. Oxfd, F. B. E. an, M.B. Lond., J. A. H. Collyns, M.B. Camb., E. G. Cook, Lond., R. I. G. Coupland, M.B. Camb., R. H. Cutforth, Lond., D. F. Davies, M.B. Birm., D. M. Davies, M.D. Leeds, D. B. Davies, M.B. Camb., Walter Dickson, M.B. Manc., Dolphin, M.D. Dubl., B. V. Earle, M.B. Dubl., J. R. D. M.B. N.Z., Ali El-Sayed Eissa, M.B. Cairo, H. L. Ellis, Camb., C. C. Ewart, M.B. Sydney, A. N. Exton-Smith, Camb., Walter Fabisch, M.D. Berlin, M.D. Palermo, D. A. M.D. Lond., H. V. L. Finlay, M.B. Edin., P. B. Fox, T. T. Fulton, M.D. Cincinnati, M.B. Belf., Irving Gilbert, Lond., Shivapuje Veerabadra Setty Govinda Setty, Mysore, M. J. Greenberg, M.B. Camb., Christopher Gresson, J. R. Harries, M.B. Lond., R. V. Johnston, M.B. Durh., B. S. Keat, M.B. Lond., J. O. Laws, M.B. Camb., A. G. Leishman, Camb., I. C. Lewis, M.B. Edin., G. H. T. Lloyd, M.B. Lond., M. Lord, M.B. Lond., L. C. Lum, M.B. Adelaide, R. H. G. M.B. Camb., A. R. Lyons, M.D. Belf., R. K. MacCuish, A. C. Macdonald, M.B. Glasg., George Macdonald, Lpool, L. E. McGee, M.B. Camb., J. K. Martin, M.B. Lond., Miller, M.B. Lond., Irving Miller, M.D. Manitoba, E. H. M.B. Edin., Behman Sorab Moos, M.D. Bombay, A. A. M.B. Lond., John Nash, M.D. Dubl., Siva Rama Krishna avati, M.B. Rangoon, I. C. L. Patch, M.B. Lond., Somabhai al Patel, M.B. Bombay, M. B. Pemberton, M.B. Witw'srand, Rahim Piracha, M.B. Punjab, E. MacL. Poulton, B.M. Oxfd, M.B. Lond., D. H. Reilly, M.D. McGill, P. K. Renshaw, Camb., P. L. Robinson, M.B. Lpool, R. S. Savidge, M.B. Lond., Stein, M.B. Witw'srand, George Skinner, L.R.C.P., A. W. M.B. Glasg., W. H. Smith, M.D. Melb., W. G. Spector, Camb., M. P. Spence, M.B. Camb., J. W. Stephens, L.R.C.P., P. Steck, M.D. Brist., D. H. P. Streeten, M.B. Witw'srand, Taylor, M.B. Manc., R. W. Temple, M.B. Dubl., H. R. M.B. Lond., P. A. Thorn, M.D. Lond., Eric Waddington, Lond., D. C. Watson, M.B. Lpool, S. P. B. Way, M.B. Lond., Whitaker, M.D. Leeds, J. B. Wild, M.B. Lond., H. B. L. L.R.C.P., I. G. Williams, M.B. Lond., F. B. M. Woodhouse, D. G. Wraith, M.B. Camb., G. A. Wright, M.B. Wales, Lond.

ces to practise were conferred upon the following 146 es (113 men and 33 women) who have passed the mination of the Conjoint Board and have complied by-laws of the college:

M. Adams, Maureen B. Adams, D. A. Ager, D. D. Alexander, xander, J. D. Arneaud, N. O. Ascroft, K. A. Baker, K. L. D. F. Bedford, D. P. Belgrave, Silvio Benaim, G. R. Elizabeth Bennett, J. M. Bernstein, A. L. Berwitz, T. B. J. A. L. Bonnell, P. H. Bracewell, A. T. Broadbridge, Brock, R. J. Carey, J. K. Carter, W. I. Carter, J. A. Cheese, M. Chippindale, Montague Cohen, W. W. H. Colmer, h D. Connan, W. E. Cooper, A. A. Craigen, Phyllis A. M. D. A. Davey, D. H. Davies, G. J. Davies, Gwenhwyfar V. J. E. Davies, Nuala M. Dowdall, R. W. Doy, Shirley R. B. H. du Heaume, Gwenllian Edwards, A. A. Eley, Mary G. H. B. F. Fairley, Jack Fine, C. A. Foster, Lois Gardiner, Gardner, G. M. Gould, A. A. Graham, Edwina E Green, A. Hahn, D. C. Hall, J. A. H. Hancock, D. F. N. Harrison, Haughton, G. E. Haward, R. B. Heisch, A. A. Hobbs, P. H. C. I. Hood, J. C. Humber, K. M. S. Hume, Marjorie J. T. E. Jeffreys, Beryl M. Joles, C. R. Jolly, D. H. Jones, Kahn, M. A. Kalina, A. J. Karlish, Mohan Singh Kataria, Ratan Ker, Eric Killey, G. S. Laing, Percy Lancer, B. H. Gerda Lewin, E. A. C. Lloyd, V. A. Lloyd, Mary Lloyd- F. A. H. Logie, R. H. Longton, J. A. Ludwig, Bernard Elizabeth G. S. McDowall, Meherbanoo Hormasji Masina, Menon, John Monckton, D. K. Morgan, D. McK. K. Muir, Neville, W. T. Newman, Anne Nunan, H. M. C. O'Driscoll, M. Ottaway, K. L. Owen, J. J. Owles, Owen Parry-Jones, I. C. Payne, G. W. Pearce, M. C. Peterside, E. M. D. G. Price, Margaret D. E. Quinet, B. W. Richards, F. Richards, J. L. Richards, W. R. Riley, I. R. L. Rose, W. Ruscoe, D. G. Rushton, J. M. S. St. John, E. R. J. Habib Janmahomed Sayani, W. K. Schnarr, D. N. M. Scott R. G. Seager Thomas, S. A. V. Serviss, Pauline M. Seymour- P. W. Shillito, D. W. Smith, R. S. Sneath, D. H. K. Soltau, Speight, G. D. Starte, G. A. Steele, Mildred A. R. Stilson, C. Sumption, R. L. H. Tasker, D. G. Taylor, Margery W. Jindrich Tintner, D. A. T. Tizard, Jean M. Tomlinson, Trencham, S. E. Trickey, P. G. Tuffnell, R. J. Vale, Jehangir Vazifdar, Tom Wade-Evans, P. R. Wagner, Norma M. F. R. H. Wrigley, J. R. W. Wynne.

Diplomas were conferred on those named in the report the meeting of the Royal College of Surgeons in THE of Oct. 23 (p. 673). The following diplomas were conferred:

D.O.M.S.—J. S. McKenty.

D.C.H.—M. F. Moss.

D.Phys.Med.—G. H. Dobney, D. M. L. Doran, Joan M. Gold, Gregg, J. B. M. Milne, K. W. N. Palmer, J. D. Thompson, R. W. Windle.

Royal College of Surgeons of Edinburgh

At a meeting of the college held on Oct. 27, the following office-bearers were elected for the ensuing year: president, Mr. Frank Jardine; vice-president, Mr. J. M. Graham; secretary and treasurer, Mr. K. Paterson Brown; councillors, Dr. G. Ewart Martin, Mr. W. Quarry Wood, Mr. Walter Mercer, Prof. J. R. Learmonth, Dr. W. F. Theodore Haultain, Mr. R. L. Stewart; representative on the General Medical Council, Sir Henry Wade; conservator of museum, Mr. J. N. J. Hartley; convener of museum committee, Mr. W. Quarry Wood; librarian, Dr. Douglas Guthrie.

The following were admitted to the fellowship:

Alexander Adam, Ghanim Yacoub Akrawi, J. L. Anderson, J. H. H. Balmer, Narendra Chandra Banerjee, Aubrey Belles, Solomon Bender, J. A. Bentham, T. A. Berry, Kalindi Ganesh Bhate, J. G. Bickerton, O. M. Brewster, D. T. A. Brown, J. C. McC. Browne, P. L. Brunnen, Samuel Burke, A. E. Burton, R. W. Busschau, T. S. Chalmers, HHimangsu Sekhar Chaudhuri, Kahan Chand Chopra, Daphne Wai Chan Chun, G. L. Clark, Harry Colman, P. U. Creighton, Kandarpa Tuljashanker Dholakia, W. A. J. Donald, J. W. Eadie, C. O. Easmon, Ahmed Fattouh Abdel Fattah, R. J. A. Fraser, J. R. Frylinck, Yogendra Lakshmidas Ganjawala, C. C. Gardner, Surajit Prosad Ghosh, I. E. W. Gilmour, M. A. Goodwin, Don F. de S. Goonawardena, Alexander Gonski, Walter Gordon, A. A. Haig, R. L. Hartley, F. J. Hedden, O. K. Hjertaas, A. R. Hodgson, J. M. Hoffman, D. W. Hulsh, Margaret A. Ingram, F. L. F. Innes, L. A. Jacobs, H. V. Jones, J. D. Joubert, C. V. Jumeaux, Rasiklal Mohanlal Kamdar, S. K. Kay, H. H. Kennedy, H. I. Le Brun, R. B. Lynn, Girija Shankar Das Mahapatra, C. B. R. Mann, W. B. Martin, Annamma Mathan, N. D. Matson, G. E. Mavor, Khushru Mancherji Mehta, B. F. Miller, R. J. V. Milner, G. P. Mitchell, Philip Moore, Salathiel Morgan, Ernest Morrison, E. L. F. McConnachie, Alasdair MacKellar, R. G. MacLeod, R. A. M. McVicker, J. D. O'Flynn, W. J. O. Page, A. T. S. Paul, A. M. Porter, Henry Proctor, Alexander Raxlen, Frank Riggall, E. L. S. Robertson, A. P. Sandrasagra, P. P. H. Schmidt, N. C. Scott, El Sayed Abdel Khalek Himmat Abou Shabanah, William Sillar, Appacutty Sinnatamby, E. W. O. Skinner, Arthur Skowron, H. A. Smith, W. F. Smyth, Ralph Spencer, H. M. Stevenson, W. B. Stirling, Bahman Sohrabji Surti, Geoffrey Sutherland, J. W. Sutherland, K. G. Symonds, L. R. Taylor, M. N. Teubes, L. W. Warcup, C. C. Wark, Samir Riad Wassef, Arthur Webb-Jones, W. F. White, A. E. Wilkinson, D. G. Wright, S. P. Wrightson.

Physiology of Vision

Prof. H. Hartridge, F.R.S., will give four lectures on this subject at Gresham College, Basinghall Street, London, E.C.2, on Monday, Wednesday, Thursday, and Friday, Nov. 8, 10, 11, and 12, at 5.30 P.M.

South East Metropolitan Regional Tuberculosis Society

The inaugural meeting of this society will be held at the County Hospital, Sevenoaks Road, Orpington, Kent, on Saturday, Nov. 13, at 11 A.M. Brigadier H. L. Glyn Hughes, senior administrative medical officer of the region, will speak, and all interested doctors in the region and particularly those engaged in chest work are invited to attend.

Retirement of Dr. Fairfield

Dr. Letitia Fairfield, whose retirement is announced, was a senior medical officer in the L.C.C. service, which she entered in 1912.

For some years, Dr. Fairfield, who is also a barrister-at-law, worked in the council's school medical service, first as assistant and later as divisional medical officer. In 1930 she was promoted to senior medical officer—the first woman to hold this rank—and since then she has been engaged mainly in the hospital and ancillary services. During the first world war she became woman medical director, Royal Air Force; and in 1919 she was appointed C.B.E. In the late war she was chief medical officer of the A.T.S. until 1942, when she reached the age-limit for this appointment.

Faculty of Ophthalmologists

On Oct. 8 the council considered the question of fees for ophthalmic examination of school-children. When it was discovered that extremely high figures were being claimed in fees for this work, the Ministry of Health, after communication with the hon. secretary of the faculty and the British Medical Association, issued a circular postponing all payments until a figure had been agreed. At a meeting of the ophthalmic subcommittee of the Negotiating Committee with the Ministry of Health it was agreed that the school medical service should come under the hospital service by March 31, 1949, and that in the meantime a fee of £6 6s. per session should be paid, subject to Treasury approval. In spite of the strong recommendations of the delegates at this meeting, the Minister remained adamant that glasses prescribed privately should not be obtained free within the service.

It has been agreed that opticians working under the Supplementary Ophthalmic Service should refer to ophthalmic surgeons all patients who do not achieve a visual acuity of 6/6.

Medical and Dental Defence Union of Scotland

In this union's report for the year ended Aug. 8, the membership is given as 6096—an increase of 191 over last year's total. Assets amount to over £37,000, representing a reserve per member of £6 2*s.* 4*d.*; and the cost per member during the year was 15*s.* 10¾*d.*, leaving a balance, out of each £1 subscription, of 4*s.* 1¼*d.*

Manchester Regional Hospital Board

On Oct. 26 the board, as reported in the *Manchester Guardian* of Oct. 27, decided to submit for the approval of the Minister of Health estimates of expenditure for 1949–50 amounting to £12,906,248. Of this sum £696,258 represents capital expenditure. Under the heading of maintenance account, the cost of the board's central administration is put at £61,500; and other direct expenditure at £784,500. Costs of central administration of hospital management committees are estimated at £235,240, and of their general maintenance at £11,128,750.

London Hospital Dinner

Presiding over the old students' dinner in London on Oct. 28, Mr. Robert Milne welcomed back the women students who had "come to the rescue" in the 1914 war, and who now attended the gathering for the first time. In a chronicle of events since the last dinner he spoke of losses to the hospital by the death of Cecil Wall, George Riddoch, and G. T. Western, and by the retirement of W. S. Herm n, Arthur Burrows, Charles Goulden, John Parkinson, H. S. Souttar, and Ashley Daly. Of retirement he remarked that when for many years one has spent three or four half-days (not "sessions") at hospital, and then stops, one can find life very pleasant. Among new appointments, he mentioned especially the return of Victor Dix to be professor of surgery, and Dorothy Russell's appointment to the chair of pathology—in succession to a man who was consecutively known as H. M. Turnbull, Dr. Turnbull, Professor Turnbull, and The Chief, and was entitled to all four names because he did four men's work. Permitting himself a single reminiscence, Mr. Milne then described a night in 1903 when Warner and Dawson's house-physician was operated on for appendicitis (he has lately written to say that he can still run after a bus) and soon afterwards a burglar had a stab wound of the heart sutured (he has lately written to say that he can still run after a bus, and catch it and has led a respectable life). People had the idea that hospitals are places to which patients go for perhaps four weeks, and then pass on; to which students go for perhaps four years, and then leave forever; a place where ships pass in the night. But this was not true: a hospital was a place of continuing friendships and lasting memories—memories of chiefs who bullied you when you were a houseman, and of housemen who bullied you when you were a chief. The London Hospital, for all its internal changes, still stood exactly where it did: and on emerging from Whitechapel station one could still detect the faint smell of coffee and human unwashedness described by Henry Bashford 38 years ago. The hospital's ambition was to produce a thoroughly sound doctor, to be depended on in emergency, who would do the right thing even if he didn't quite know why. It had produced great men of science, like Henry Head and Hughlings Jackson, but also men of great service like Barnardo and Grenfell. He had a faint fear that in the new system unselfishness and the spirit of service might be snowed under, but he asked his hearers to drink the hospital's health in the hope that they would continue.

Mr. Souttar proposed The Chairman, whom he praised as an example of something now lost—the general surgeon who has made a brilliant success as a specialist. He also mentioned qualities of character, familiar to all Mr. Milne's students, which made the response to this toast particularly warm.

Dr. R. J. Peters, deputy chief medical officer of the Department of Health for Scotland, has left for the United States where he is to attend the annual conference of the American Public Health Association. Dr. Peters will also attend, along with Dr. A. H. Gale of the Ministry of Health, a subcommittee on the control of infectious diseases set up by the committee on research and standards of the association.

CORRIGENDUM: *Dentures and Anæsthesia.*—As printed, the reference to acrylic resin in Mr. Phillips's letter last week (p. 708) was incorrect. His point was that acrylic resin is *not* opaque to X rays.

Appointments

BLAKE, H. E., M.A., B.CHIR. Camb., F.R.C.S., F.R.C.S.E.: pla surgeon, St. George's Hospital, London.
WAMBEEK, W. G. L., M.R.C.S.: airport M.O., Middlesex Con Council.

Guy's Hospital, London:
BEYNON, D. W., M.B. Lond., M.R.C.P., D.C.H.: assistant to dire of department of pædiatrics.
HAFFNER, C. E. L., M.B. Edin., D.P.M.: registrar in departmen psychological medicine.
REDMAN, E. G., M.B. Dubl., D.M.R.: registrar in department diagnostic radiology.

St. Andrew's Hospital, London:
BOLGER, J. T., M.B. N.U.I.: asst. M.O., class I.
HAMILTON, J., M.B., D.A.: senior resident anæsthetist.

Diary of the Week

NOV. 7 TO 13

Monday, 8th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. *Mr. R. M. B. MacKenna: Dermatology in its R* to General Medicine. (Part I.)
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. G. A. Mitchell: Autonomic Nervous Syst
5 P.M. Mr. R. J. Ludford, D.SC.: Malignant Growths in Culture.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8 P.M. *Pathological meeting.*

Tuesday, 9th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. J. Purdon Martin: Local Lesions of the Cord. (Part I.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. John Kirk: *Topographical Anatomy* Thorax.
5 P.M. Dr. J. E. Cates: Renal Function.
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. Harold Corsi: Scars.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn W.C.2
11.30 A.M. Dr. T. S. Littler: Physical Principles of Audio and Hearing-aids.
2.15 P.M. Dr. E. H. R. Harries: Respiratory Tract in Infe Diseases.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate Te S.W.7.) Mr. John Hanby, F.I.S.CH.: Value of Chir in Foot Disabilities.

Wednesday, 10th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. D. W. Brooks: Recent Advances in Treatment of Pulmonary Tuberculosis. (Part I.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Cates: Renal Function.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Port Place, W.1
3.30 P.M. Dr. N. L. Lloyd: Placing the Impaired Work Industry.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vi Street, Glasgow
5 P.M. Prof. D. M. Dunlop: Clinical Use of the Anti-hista Drugs. (Finlayson lecture.)

Thursday, 11th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. H. Sheldon: Tuberculosis in Childhood.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Kirk: Anterior and Posterior Abdon Walls.
5 P.M. Mr. L. E. C. Norbury: Proctology Throughout Ages. (Bradshaw lecture.)
INSTITUTE OF NEUROLOGY, National Hospital, Queen Sq W.C.1
5 P.M. Prof. W. E. Le Gros Clark, F.R.S.: Olfactory Sy and the So-called Rhinencephalon.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. L. Forman: Pruritus.
HONYMAN GILLESPIE LECTURE
5 P.M. Dr. T. A. H. Munro: Diagnosis and Treatment Depression. (Edinburgh Royal Infirmary.)

Friday, 12th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. Purdon Martin: Local Lesions of the Sp Cord. (Part II.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. H. G. Hanley: Micturition.
5 P.M. Dr. H. F. Brewer: Blood Transfusion.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
2.15 P.M. (26, Portland Place, W.1.) Mr. Claud Mullins, J. Psychiatry in the Criminal Courts. (Maudsley lecture.)
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. R. Sleigh Johnson: Acute Respiratory Infection

THE PERIOD OF TRANSMISSION IN CERTAIN EPIDEMIC DISEASES

AN OBSERVATIONAL METHOD FOR ITS DISCOVERY

R. E. HOPE SIMPSON
M.R.C.S.

om the Epidemiological Research Unit (M.R.C.), Cirencester, Glos

FOR the effective practice of public-health measures is important to discover (1) when and for how long any case of infection a communicable disease may be turally transmitted to other persons; (2) the range variability of this infective period; and (3) the ximal error of the method used.

A single over all measurement including all three factors required, and this paper seeks to show how the simple ervational methods practised by Budd and by Panum d Manicus in the nineteenth century, and by Pickles d others more recently, can provide this information certain sorts of epidemic disease.

The method is based on the information derived from o types of measurement: (1) the time elapsing between eipt of infection and manifestations of illness—the ubation period—and (2) the time between the illness one patient and the illness of those he has infected the serial interval.

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The serial interval (indirectly) measures AB. The incubation period measures AC. It is simple to subtract the incubation period from the serial interval and so find BC, the interval between the chosen manifestation and the transference of the disease. It is well at the outset to be rid of any preconceptions about where, in relation to the clinical illness, the period of transmission will be discovered.

A very variable incubation period will introduce a factor which might well dwarf the period of transmission and stultify the practical utility of the method. The constancy of the incubation period depends on the stability in the cycle of the illness of the manifestation chosen for measurement, and the methods of making a wise choice are fully discussed below. Those acute exanthems which appear in successive crops of cases at a more or less constant interval clearly possess relatively small variability of their incubation period, and form suitable subjects for study by the present method. Nevertheless some symptoms in measles, for example, are far more variable in the time of their appearance than are others, and Panum commented on the stability of the time of appearance of the rash compared with that of the first onset of illness, and he chose the time of emergence of the exanthem as the manifestation for measurement of the incubation period and the serial interval.

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Epidemiological studies are often difficult to compare, even when they are similar, because of differing interpretations of the technical terms in use. For precision and comparability it has been thought necessary to define certain terms used here. The definitions are not claimed as final or universally applicable. The want of a nomenclature agreed by epidemiologists is, however, so pressing that it is to be hoped that one will not be long in appearing.

Study of the principle outlined above leads to a recognition of certain relationships which can most clearly and briefly be represented symbolically and mathematically. The following symbols will therefore be used:

d, point of measurement for a case
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k, range of variation of K
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x, range of variation of X
Y, time elapsing between receipt of infection in receptor case and point of measurement d in donor case
Y′, interval between mid-point of period of transmission and measuring-point d
y, duration of period of transmission.

For comparison with other work, synonyms taken from epidemiological literature are supplied, and the reason is sometimes given for the choice of the preferred name. Inappropriate terms, if much used, have been included as "synonyms" of the correct term, with a note of the error.

A communicable disease is an example of host-parasite relationship and, from the viewpoint of the invading organism, is a part of the cycle of parasitism.

> *Cycle of parasitism* (cycle of the infection): the natural history of an infecting organism, including means of access to and entrance into the human host, migrations, abodes, and morphological changes in the host tissues, means of egress, and transmission directly or indirectly to other human hosts, the biology of any intermediate stages, and the behaviour and destiny of any of the organisms remaining in the host after the period of transmission.

The necessities of reproduction and species-survival are closely linked with the phenomena of human illness,

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[1] Panum, P. L. Observations made during the epidemic of measles on the Faroe Islands in the year 1846. New York, 1940.

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Medical and Dental Defence Union of Scotland

In this union's report for the year ended Aug. 8, the membership is given as 6096—an increase of 191 over last year's total. Assets amount to over £37,000, representing a reserve per member of £6 2*s.* 4*d.*; and the cost per member during the year was 15*s.* 10¾*d.*, leaving a balance, out of each £1 subscription, of 4*s.* 1¼*d.*

Manchester Regional Hospital Board

On Oct. 26 the board, as reported in the *Manchester Guardian* of Oct. 27, decided to submit for the approval of the Minister of Health estimates of expenditure for 1949–50 amounting to £12,906,248. Of this sum £696,258 represents capital expenditure. Under the heading of maintenance account, the cost of the board's central administration is put at £61,500; and other direct expenditure at £784,500. Costs of central administration of hospital management committees are estimated at £235,240, and of their general maintenance at £11,128,750.

London Hospital Dinner

Presiding over the old students' dinner in London on Oct. 28, Mr. Robert Milne welcomed back the women students who had "come to the rescue" in the 1914 war, and who now attended the gathering for the first time. In a chronicle of events since the last dinner he spoke of losses to the hospital by the death of Cecil Wall, George Riddoch, and G. T. Western, and by the retirement of W. S. Herm n, Arthur Burrows, Charles Goulden, John Parkinson, H. S. Souttar, and Ashley Daly. Of retirement he remarked that when for many years one has spent three or four half-days (not "sessions") at hospital, and then stops, one can find life very pleasant. Among new appointments, he mentioned especially the return of Victor Dix to be professor of surgery, and Dorothy Russell's appointment to the chair of pathology—in succession to a man who was consecutively known as H. M. Turnbull, Dr. Turnbull, Professor Turnbull, and The Chief, and was entitled to all four names because he did four men's work. Permitting himself a single reminiscence, Mr. Milne then described a night in 1903 when Warner and Dawson's house-physician was operated on for appendicitis (he has lately written to say that he can still run after a bus) and soon afterwards a burglar had a stab wound of the heart sutured (he has lately written to say that he can still run after a bus, *and* catch it and has led a respectable life). People had the idea that hospitals are places to which patients go for perhaps four weeks, and then pass on; to which students go for perhaps four years, and then leave forever; a place where ships pass in the night. But this was not true: a hospital was a place of continuing friendships and lasting memories—memories of chiefs who bullied you when you were a houseman, and of housemen who bullied you when you were a chief. The London Hospital, for all its internal changes, still stood exactly where it did: and on emerging from Whitechapel station one could still detect the faint smell of coffee and human unwashedness described by Henry Bashford 38 years ago. The hospital's ambition was to produce a thoroughly sound doctor, to be depended on in emergency, who would do the right thing even if he didn't quite know why. It had produced great men of science, like Henry Head and Hughlings Jackson, but also men of great service like Barnardo and Grenfell. He had a faint fear that in the new system unselfishness and the spirit of service might be snowed under, but he asked his hearers to drink the hospital's health in the hope that they would continue.

Mr. Souttar proposed The Chairman, whom he praised as an example of something now lost—the general surgeon who has made a brilliant success as a specialist. He also mentioned qualities of character, familiar to all Mr. Milne's students, which made the response to this toast particularly warm.

Dr. R. J. Peters, deputy chief medical officer of the Department of Health for Scotland, has left for the United States where he is to attend the annual conference of the American Public Health Association. Dr. Peters will also attend, along with Dr. A. H. Gale of the Ministry of Health, a subcommittee on the control of infectious diseases set up by the committee on research and standards of the association.

CORRIGENDUM: *Dentures and Anæsthesia.*—As printed, the reference to acrylic resin in Mr. Phillips's letter last week (p. 708) was incorrect. His point was that acrylic resin is *not* opaque to X rays.

Appointments

BLAKE, H. E., M.A., B.CHIR. Camb., F.R.C.S., F.R.C.S.E.: pl
surgeon, St. George's Hospital, London.
WAMBEEK, W. G. L., M.R.C.S.: airport M.O., Middlesex Co
Council.

Guy's Hospital, London:

BEYNON, D. W., M.B. Lond., M.R.C.P., D.C.H.: assistant to dir
of department of pædiatrics.
HAFFNER, C. E. L., M.B. Edin., D.P.M.: registrar in departme
psychological medicine.
REDMAN, E. G., M.B. Dubl., D.M.R.: registrar in departmen
diagnostic radiology.

St. Andrew's Hospital, London:

BOLGER, J. T., M.B. N.U.I.: asst. M.O., class I.
HAMILTON, J., M.B., D.A.: senior resident anæsthetist.

Diary of the Week

NOV. 7 TO 13

Monday, 8th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Mr. R. M. B. MacKenna: Dermatology in its Rel
to General Medicine. (Part I.)
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. G. A. Mitchell: Autonomic Nervous Syste
5 P.M. Mr. R. J. Ludford, D.SC.: Malignant Growths in Ti
Culture.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8 P.M. Pathological meeting.

Tuesday, 9th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. J. Purdon Martin: Local Lesions of the
Cord. (Part I.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. John Kirk: Topographical Anatomy
Thorax.
5 P.M. Dr. J. E. Cates: Renal Function.
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. Harold Corsi: Scars.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn
W.C.2
11.30 A.M. Dr. T. S. Littler: Physical Principles of Aud
and Hearing-aids.
2.15 P.M. Dr. E. H. R. Harries: Respiratory Tract in In
Diseases.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate T
S.W.7.) Mr. John Hanby, F.I.S.CH.: Value of Chi
in Foot Disabilities.

Wednesday, 10th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. D. W. Brooks: Recent Advances
Treatment of Pulmonary Tuberculosis. (Part I.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Cates: Renal Function.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Po
Place, W.1
3.30 P.M. Dr. N. L. Lloyd: Placing the Impaired Wo
Industry.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. V
Street, Glasgow
5 P.M. Prof. D. M. Dunlop: Clinical Use of the Anti-his
Drugs. (Finlayson lecture.)

Thursday, 11th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. H. Sheldon: Tuberculosis in Childhood.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Kirk: Anterior and Posterior Abd
Walls.
5 P.M. Mr. L. E. C. Norbury: Proctology Throughou
Ages. (Bradshaw lecture.)
INSTITUTE OF NEUROLOGY, National Hospital, Queen S
W.C.1
5 P.M. Prof. W. E. Le Gros Clark, F.R.S.: *Olfactory S*
and the So-called Rhinencephalon.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. L. Forman: Pruritus.
HONYMAN GILLESPIE LECTURE
5 P.M. Dr. T. A. H. Munro: Diagnosis and Treatme
Depression. (Edinburgh Royal Infirmary.)

Friday, 12th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. Purdon Martin: Local Lesions of the S
Cord. (Part II.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. H. G. Hanley: Micturition.
5 P.M. Dr. H. F. Brewer: Blood Transfusion.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION
2.15 P.M. (26, Portland Place, W.1.) Mr. Claud Mullin
Psychiatry in the Criminal Courts. (Maudsley lecture
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. R. Sleigh Johnson: Acute *Respiratory* Infectio

THE PERIOD OF TRANSMISSION IN CERTAIN EPIDEMIC DISEASES

AN OBSERVATIONAL METHOD FOR ITS DISCOVERY

R. E. HOPE SIMPSON
M.R.C.S.
Epidemiological Research Unit (M.R.C.), Cirencester, Glos

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The necessities of reproduction and species-survival are closely linked with the phenomena of human illness, individual or communal, especially perhaps in infection by obligate parasites. Hence it is wise continually to attempt a mental picture of the correlation between the cycle of parasitism and the human aspect of the relationship with which the remaining definitions are chiefly concerned.

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[1] Panum, P. L. Observations made during the epidemic of measles on the Faroe Islands in the year 1846. New York, 1940

Cycle of illness (disease cycle); the effects on the human host of parasitism by a particular species of organism or complex of organisms, including disturbances to health, periods during which he is infectious to others directly or through intermediate agencies, complications, sequelæ, any resulting change in resistance to the causal or to other species of organism, the duration and temporal relationships of these episodes, and their correlation with the cycle of parasitism.

The synonym "disease cycle" is rejected because it has also been used for the next conception.

Cycle of the epidemic (disease cycle): the course of an outbreak of infectious disease in a community.

Waves (epidemic waves; waves of the disease; waves of the infection): fluctuations in the morbidity due to a communicable infection in a community.

The following definitions relate particularly to the present method of intimate epidemiology:

Day of measurement for a case (symbol d—1): the day of occurrence of the sign chosen for epidemiological measurement. The day of measurement for a series of cases (d—1 in the initial case) is symbolised D—1.

Hitherto most analyses have been related to the day of measurement itself, sometimes written d_0. This is confusing in that the "measuring-point" occupies 24 hours, a disadvantage also found in block charts. When accurate dates can be secured with certainty, it is better to fix an arbitrary zero point from which to measure forwards and backwards serially, those days preceding the point being distinguished by a minus sign. The least disturbance to current methods is caused by selecting midnight after the manifestation chosen for measurement.

Point of measurement d *for a case* (zero point): midnight (24.00 hr.) on the day of measurement.

The *days of the disease* are then enumerated not from the usually unknown receipt of the infection but from d.

Point of measurement D *for a series of cases* is the zero point of the initial case, and the *days of the epidemic* are enumerated therefrom. Reference to the charts will make the system clear.

Attempts are often made to study infectiousness by the effect on small communities, such as households, of the occurrence of the first case of a disease, usually termed primary. Subsequent cases, if they fall about the expected interval from the primary case have been termed secondary, whether or no there is evidence that they were due to the first case. A modification of this usage is proposed here as follows:

Primary case: in respect of a single case, a group, or a series of cases of any size, the case giving rise to them.

Secondary case: a case arising directly from a known primary case.

Tertiary case: a case arising from a primary case through the mediation of a secondary case.

Quaternary case: a case arising from a known primary case through a secondary and a tertiary case.

The series continues indefinitely. For present purposes the problems of the carrier and of the inapparent infection are ignored. They will be dealt with when the principle of this work has been clearly established.

These more precise definitions are useful where access to the basic data is sufficiently intimate to make them workable, and they may reveal information conceale by including intervals between cases not causally connected. For remote work, based for instance on notifications, such terms as "first cases" and "second-grou cases" might be substituted.

The word "wave" is often used to describe th successive crops of cases occurring, for instance, i measles, but is here reserved for those larger fluctuation of a disease where precision about case-relationships impossible. In small epidemics it is usually possible be definite that each crop forms a fresh "generation of the infecting organism.

Second generation (secondary wave): the total cro of secondary cases derived from a primary case.

Third generation (tertiary wave): the total crop tertiary cases derived from a primary case.

The series continues indefinitely. Each case is record at the point of measurement, and the time from the point of the first case of the crop to that of the last case the duration of the generation. It will be shown below th this is an important measurement.

Serial interval K (transmission interval, incubati interval, case interval, wrongly incubation period the interval between the measuring-points in a prima case and its secondary case.

The serial interval for a disease, an epidemic, or a gro of cases is collectively described by $K' \pm {}^{1}/_{2}k$, where K the median value, and k the range of variation of the indivi serial intervals K. A second generation offers a di measurement of $K' \pm {}^{1}/_{2}k$ from the primary case.

Incubation period X: the interval between rec of infection and point of measurement d.

The incubation period in a disease or group of cases of size is collectively described by $X' \pm {}^{1}/_{2}x$, where X′ is median value, and x the range of variation of individ incubation periods X.

Period of infectivity (period of infectiousness or transmissibility): the days of the cycle of illn during which the disease is naturally transmissible.

Period of transmission y: that portion of the peri of infectivity during which transference of infecti actually takes place in any case or group of cases.

The time elapsing between a single transmission of infecti and the point of measurement d in any case is denoted When it is possible to determine the duration of a peri of transmission y, it is described in relation to the point measurement by the formula $Y' \pm {}^{1}/_{2}y$, Y′ being the medi of the individual values of Y—i.e., that measured from t mid-point of y.

The limits of the period of infectivity are difficult ascertain, depending on correlation of the period of transmission with the times at which expos susceptibles consistently do not take the disease. Th period of transmission usually does not represent th whole period of infectivity, for such reasons as (1) hig infectivity exhausting the supply of susceptibles; an (2) severe illness removing cases from effective conta with susceptibles.

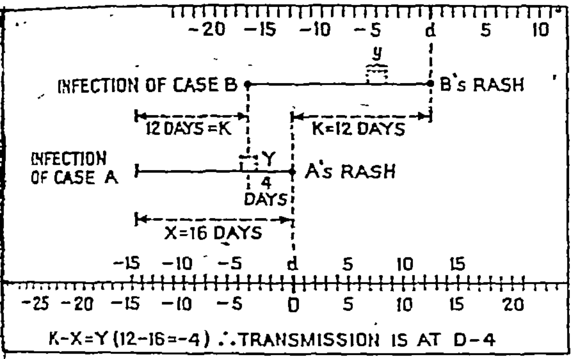
The study of the variability of these epidemiologic measurements is of great importance, and the variatio may be usefully divided into two groups:

Extraneous variability not attributable to th behaviour of the disease—e.g., that due to fault memory, witnessing, observation, &c.

Inherent variability attributable to the disease—e.g. that due to variation in the incubation period.

In some diseases the extraneous variability can wit care be reduced nearly to nil. The variation of th serial interval k will then be entirely inherent and wi depend on two components only: (1) the variability of the incubation period X; and (2) the duration o the period of transmission y. Thus:

$$y + x = k \quad \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot$$



1—Case A infects case B. Diagram shows that the serial interval K equals the time from receipt of infection by case A to transmission to case B. Use of formula K − X = Y gives day of transmission in relation to point of measurement d, X being the incubation period, Y the time between the transference of infection to case B, and d in case A.

It will be of interest ultimately to determine y parately from x. This will be part of the fruit of the instaking collection of data giving direct knowledge the variability of the incubation period and the whole ration of infectivity, and will perhaps be of most portance in the study of the biology of the infecting ganism.

For duration of isolation or quarantine the total value k—i.e., x + y—gives the requisite information, and purposes of deliberate exposure to infection the mean K′ − X′ will serve until days of differing degrees infectiousness have been decided precisely.

SIGNIFICANCE OF THE SERIAL INTERVAL: K

The serial interval K between the zero points in cases, if the incubation period is the same in both, a precise indirect measurement of the time elapsing en receipt of the infection in the first case and of infection in the second. If transference is from case to case; it therefore gives a measure of me between receipt and transmission of infection first case (see fig. 1). The serial interval gives no ation about the duration of the incubation period. over, the time of transmission that it reveals is ed to an unknown point—the receipt of infection. be of practical use the information must be anchored the known point, the point of measurement d, by discovery of the incubation period X. Then K − X describe Y, the point of transmission in relation to d:

$$Y = K - X \quad .. \quad .. \quad .. \qquad II$$

quotation from Panum might be summarised as follows:

$$Y = K - X = 13 - 13 = 0$$

transmission is taking place at d, the point chosen for rement. If the incubation period had been found to 4 days longer than the serial interval, clearly transmission have been occurring 4 days before the point of rement—i.e., on d − 4. Thus:

$$Y = K - X = 13 - 17 = -4.$$

If the incubation period was 10 days shorter than the al interval, then

$$Y = K - X = 15 - 5 = 10$$

transmission would be occurring on d 10—ten days r the zero point.

Simple as is this relationship, experience shows that is wise to emphasise it clearly. The incubation period curately and frequently determined could by itself rovide the necessary information, but the incubation riod is difficult to determine, and discovery depends the relatively rare observation of "brief and only ssible exposures," experimental infection, and correlation of numbers of longer exposures to find the common agreement between them. X is fairly readily determined for a few cases, but to find x (the range of variation) in a reliably large series is a formidable undertaking.

The serial interval K, on the other hand, is readily available and relatively easy to determine accurately. The range of variation x of the incubation period is less than that of the serial interval k because, as shown above, k = y + x. The period of transmission, y, will usually have a perceptible duration, and x must be smaller than k. In this way determinations of the serial interval can give some idea of the degree of variability of the incubation period; and, if k is small, x will be even smaller, and may in some circumstances be negligible.

CHOICE OF MOST SUITABLE MANIFESTATION FOR MEASUREMENT

To approximate as nearly as possible to a true value of y, it is important to have the minimal variability x of the incubation period, and the value of x depends entirely on the stability in the cycle of illness of the manifestation chosen for the purposes of epidemiological measurement. The selection is therefore a nice matter and deserves more attention than it has received.

The requirements are: (1) obtrusiveness and memorability, to reduce extraneous variability; (2) stability in the cycle, to reduce inherent variability; and (3) constancy of presence, to avoid "missed cases." Investigations with different objectives will lay differing emphasis on the relative importance of each factor. Obtrusiveness and memorability can be decided by common sense, and constancy by experience. Stability is tested by the value given by k. It is well to test all the possible manifestations, as follows:

Measles

Sign	*Median serial interval* K	*Variability* k
(1) Onset of illness	13 days ..	10 days
(2) Onset of rash	$10\frac{1}{2}$ days ..	5 days
(3) Fullest rash	10 days ..	4 days
(4) Onset of conjunctivitis ..	9 days ..	5 days

24.00 hr. on the day of the fullest development of the rash is chosen as d.

Infective Hepatitis

Sign	*Median serial interval* K	*Variability* k
(1) Onset of illness	$28\frac{1}{2}$ days ..	29 days
(2) Onset of jaundice	28 days ..	14 days

The onset of the jaundice is the better choice. Unfortunately it is possible that in some epidemics anicteric cases are not uncommon. The first appearance of unusual pigmentation of the urine might merit consideration in this way. (For details see table I.)

TABLE I—SERIAL INTERVALS K IN INFECTIVE HEPATITIS TO SHOW EFFECT ON VARIABILITY k OF CHOICE OF POINT OF MEASUREMENT

Case-interval no.	Points of measurement		Case-interval no.	Points of measurement	
	Onset of illness (days)	Onset of jaundice (days)		Onset of illness (days)	Onset of jaundice (days)
1	14	28	10	31	29
2	16	25	11	31	35
3	17	21	12	34	31
4	21	24	13	39	32
5	21	26	14	39	35
6	24	24	15	40	32
7	25	25	16	43	33
8	26	31			
9	28	23	—	k = 29 days	k = 14 days

These examples are purely illustrative of the principles and importance of the choice and, though taken from actual epidemics, are too few to make the result final. To emphasise the difference made by the choice, it is instructive to give an arbitrary value to y, say 7 days, in infective hepatitis. Then:

By choice (1), $x = k - y = 29 - 7 = 22$ days
,, ,, (2), $x = k - y = 14 - 7 = 7$ days

In words, if the infectivity lasts a week, the incubation period is three times as variable when measured to the onset of illness as it is when measured to the onset of jaundice.

Whatever manifestation is chosen for measurement should be stated precisely to make work generally comparable, and the opportunity should be given of testing the stability of the selected measuring-point against measurements made from other manifestations. It is advisable to determine the reliability of the different measuring-points in the same cases, and not to compare the stability of one point in one series of cases with that of another point in another series, at least until the stabilities have been determined for a very large number of cases.

SUCCESSIVE GENERATIONS OF AN EPIDEMIC

It is convenient at this point to turn from considering the incubation period and the serial interval as isolated measurements to interpret the behaviour of outbreaks of such diseases as measles in the light of the conceptions outlined above.

Primary Generation.—An outbreak usually begins with a single case, the primary.

Second Generation.—Each secondary case will fall at a serial interval K from the primary. The range of variation between these intervals gives a direct measure of k. $K' \pm {}^1/_2k$ is therefore determined directly. In an ideal epidemic with susceptibles inexhaustibly and effectively exhibited the period of transmission y would be maximal and would represent the whole period of infectivity.

Third Generation.—The third generation in such a "saturated" epidemic would erupt during precisely twice the duration of the second and therefore occupy $2k$ or $2(x + y)$ days, however great the pool of susceptibles.

Fourth Generation.—This similarly can occupy no more than $3(x + y)$ or $3k$ days.

The K : k *Ratio*

The erupting-time can only increase by one maximal value of k in each successive generation regardless of the abundance and temporal and geographical presentation of susceptibles. Therefore the number of successive generations which can appear without overlapping can be ascertained by the ratio between the (minimal) serial interval K and its inherent variability k. $K = nk$ where n gives the number of generations which will appear without overlapping.

The reason for this is that K : k also expresses the ratio between the time K taken to develop infectivity and its duration y and variability x; $K = n(x + y)$. If n is 1 or less, only the primary case will be distinct; if n is between 1 and 2, the second generation; if n is between 2 and 3, the third generation; if n is between 3 and 4, the quaternaries; and so on.

A comparison of the epidemic pattern predicted from the ascertained values of K : k with that actually observed is a useful indication of the completeness of the observations presented by an outbreak, and of the

degree of "saturation"—i.e., the extent to whic susceptibles have been infected throughout the perio of infectivity. It is one of the methods of studyin the degree of "infectiousness" of a disease an provides suggestive evidence of possible methods transmission.

If several distinct generations of a disease appear, may be said in broad terms that the incubation peri is not very variable and the period of transmission sho in comparison with the development of infectivit The actual duration of the incubation period does n affect the phenomenon. If no clear serial pattern perceptible, either the variability of the incubati period or the period of transmission or both are so gre that their combined values equal or exceed the ti taken to develop infectivity, or else the spread of t disease is not due to direct case-to-case transmission.

Geographical Synthesis.—Even after temporal ov lapping of generations has happened it is someti possible, especially in a country district, to contin analysis of the separate generations by taking advanta of the spatial scatter of the cases that usually occu For example, a tertiary case in area 1 may become primary case for area 2. The secondaries to whi this tertiary case gives rise are the whole second generati for area 2, but are also a part of the quaternary cro the epidemic arising in area 1. By recording on pa charts it is simple to combine related cases from wi different areas into a geographical synthesis of the extent of the later generations. The method dem intimate and comprehensive acquaintance with conditions in the whole area if mistakes are to be avoi

Evidence on K *and* k *Provided by Each Generation*

The second generation gives a direct expressio $K' \pm {}^1/_2k$.

For subsequent generations it should be ruled no serial intervals may be directly inferred, even wh serial infections appear to have taken place in househo except where the possibility of another source of infec can be certainly excluded. Measles, for example, i infectious that it is usually unwise to be dogmatic ab

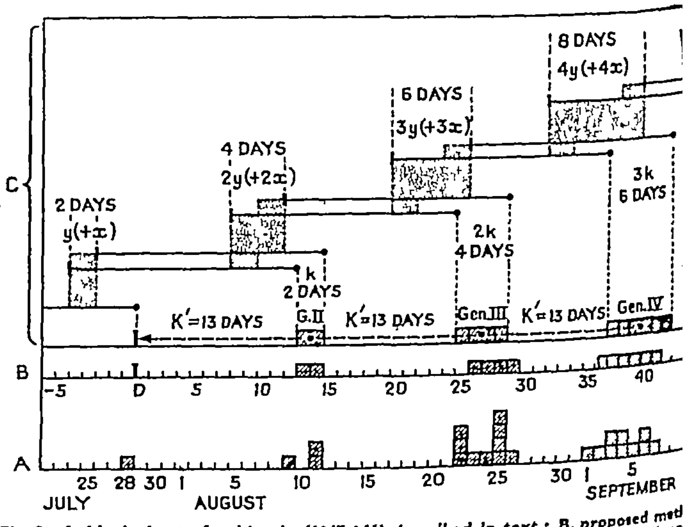


Fig. 2—A, block chart of epidemic (1947 MI) described in text; B, proposed met of charting same epidemic, using midnight on day of measurement; C, "mo epidemic" illustrating temporal relationships described in text. Data w provided by epidemic illustrated in A and B; hence calculated epidemic bloc on lower line of C is comparable with actual epidemic in B.

Data: Incubation period $X = 17$ days
Variability of incubation period $x = 0$ days
Period of transmission $y = 2$ days
Median point of transmission $Y' = d - 4$ days.

Method is to draw first and last possible cases that could be infected from prim case—horizontal lines running from receipt of infection to d in each case—and chart second generation therefrom. Process is repeated for each generation. Th during which each generation is transmitting organisms is shown by stippli Duration of appearances of d in each generation is shown by shading on lower li

TABLE II—SERIAL INTERVALS K AND THEIR VARIABILITIES k OBTAINED DIRECTLY (GENERATION 2) COMPARED WITH THOSE OBTAINED BY AVERAGING COMPONENT INTERVALS IN LATER GENERATIONS (SEE FIG. 2)

Generation 2	Generation 3		Generation 4	
Serial interval K (days)	D→d = 2K (days)	2K ÷ 2 (days)	D→d = 3K (days)	3K ÷ 3 (days)
12	25	$12^1/_2$	35	12
14	25	$12^1/_2$	36	12
14	25	$12^1/_2$	37	$12^1/_3$
ther direct values of K	26	13	37	$12^2/_3$
12	27	$13^1/_2$	39	13
13	28	14	40	$13^1/_3$
14	28	14	40	$13^1/_2$
14	28	14	41	$13^2/_3$
..	28	14	..	..
..	29	$14^1/_2$	..	..
k = 2 days	2k ÷ 2 = 2 days		3k ÷ 3 = 2 days	

ich case in a preceding generation has infected a rticular person. Experience will furnish a criterion of ctness with which to apply the rule in different eases. Its intelligent application gives great value to y exceptions which may be allowable.

The weakness of basing conclusions on secondary es in households without strong evidence that the tients were infected by the first case in the house a be understood by considering the steady expansion the appearance-time of successive generations. In first three generations such conclusions are not ly to be very misleading. Later in the epidemic, the other hand, it is clear that two members of ame household might well both have been d in the previous generation, and yet the first develop the disease a fortnight before the d (see fig. 2).

or is it just to argue that the secondary cases in a ehold would have more early opportunity to contract disease from another member of the household. may be true of the first few generations, but later the epidemic of a highly infectious disease like asles, if the first case in the household occurred late a generation, the other members of the household ght have been at risk for many days outside the ehold from those forming the earlier part of the eration.

Conclusions about times and methods of transmission, d solely on the occurrence of "secondary" cases in eholds are thus liable to grave error, and the more tracted the epidemic, the larger the possibility and ree of error.

There is, however, valuable evidence on K to be ained from the tertiaries, because each, through one the secondaries, is remote from the primary by the m of two serial intervals. It has been said that the an of the generation should be 2k; hence the position d duration of the generation may be considered from as $2K' \pm {}^1/_2(2k)$, and the fourth generation is $' \pm {}^1/_2(3k)$ in days from D. Numerous average lues for K and k may thus be obtained for comparison th those observed directly. Some are shown in table II.

APPLICATION OF THE PRINCIPLE

At the beginning it was stated that this paper would cribe an observational method of obtaining the dates d duration of infectivity, the variability of the infective riod, and the maximal error of the method used. These desiderata have been symbolised as follows: median day of infectivity $d - Y'$; and duration of transmission y.

The error of the method is the same as the instability of the manifestation chosen for measurement, which is identical with the variability of the incubation period x. The variability of the infective period is contained partly in x and partly in y.

The over-all information that is sought may therefore be expressed symbolically as $Y' \pm {}^1/_2(y - x)$. It has already been shown that $y + x = k$, and that $Y' = K' - X'$. Hence the unknown position, duration, and variability of the period of transmission, and the error of the method, may be discovered from the observed serial interval and incubation period:

$$Y' \pm {}^1/_2(y + x) = K' - X' \pm {}^1/_2k \quad .. \quad \text{III}$$

The validity of the principle is self-evident. It remains to discover if any infectious diseases present a sufficiently large K : k ratio to make the methods fruitful in practice.

EXAMPLES

An analysis of a small epidemic of measles is given as a demonstration. No final conclusions about the limits and significance of any of the figures ought to be drawn until they have been correlated with large numbers of other outbreaks observed under similar conditions.

(I) *Epidemic (1947 M1)*

Primary case: on July 24, 1947, the schools being closed for the summer holidays, a girl, aged 4 years, incubating measles, probably taken from a contact 13 days before, came twenty miles to spend the holidays with a friend in a small village which had escaped measles for ten years, and which contained on that date only 29 persons, all children, not known to have had the disease. On arrival she showed signs of illness, but was not kept in bed until her rash appeared on July 27. The rash was fully developed next day; so midnight (24.00 hr.) on July 28 is d in this case and D for the epidemic.

Second generation: her friend and two little girls who played with her on July 25 and 26 are the only known susceptibles to have been at risk; d for her friend occurred on Aug. 9 and for the other two on Aug. 11. There are therefore 3 cases from D 12 to D 14:

$$K' \pm {}^1/_2k = 13 \pm 1$$

Third generation: 10 cases recorded from D 25 to D 29:

$$2K' \pm {}^1/_2(2k) = 27 \pm 2 \text{ (observed values)}$$

Fourth generation: 10 cases from D 35 to D 41:

$$3K' \pm {}^1/_2(3k) = 38 \pm 3 \text{ (observed values)}$$

Two of the susceptibles moved to another village, where they developed the disease. For simplicity they are excluded. Four of the presumed susceptibles were spared. No other cases derived from this epidemic occurred anywhere. The attack-rate of all susceptibles was 86%.

Fig. 2A shows the usual block chart of the epidemic with the method of measurement suggested in this paper superposed (fig. 2B).

Calculation: table II shows the serial interval as derived from the various generations and gives the figures for K and k. The accord is truly remarkable. The suggested incubation period of the primary case is accepted as valid for the present purpose of demonstration. The girl was infected 13 days before July 24—i.e., 17 days before d (July 28):

d is midnight (24.00 hr.) on day of fullest development of rash. Then $K' = 13$ days; $X = 17$ days; and $k = 2$ days.

$$Y' \pm {}^1/_2(y + x) = K' - X \pm {}^1/_2k = 13 - 17 \pm 1 = -4 \pm 1$$

Therefore $x + y = 2$ and Y' is at $d - 4$.

Therefore throughout this epidemic the measles was being transmitted from the fifth to the third day before midnight on the day of fullest development of the rash, $d - 5$ to $d - 3$.

It is instructive to take theoretical values of Y′, X, and y and to construct charts of epidemics for comparison with those found by observation. In this way it was found that y of 3 days gave too big a value for each generation. A very close fit with the observed facts is obtained by the values

$Y' = 4$ days; $X = 17$ days; and $y = 2$ days (note that x is ignored). This model is fully set out in fig. 2c. The relationships illustrated should help to elucidate the definitions, formulæ, and statements in the text of the paper.

(II) *A Wensleydale Epidemic*

Dr. W. N. Pickles has kindly allowed me to use an epidemic recorded in his book [2] to show to what extent the method is applicable to precise records not specially collected for this type of analysis.

Second generation: 24 cases D 12 to D 15

$$K' \pm {}^1/_2k = 13{}^1/_2 \pm 1{}^1/_2 \text{ days.}$$

Third generation: 11 cases D 22 to D 27

$$2K' \pm {}^1/_2(2k) = 24{}^1/_2 \pm 2{}^1/_2 \text{ days.}$$

From data supplied: d is midnight (24.00 hr.) on first day of rash; $X = 16$ days; $K' = 13$ days (average value); and $k = 3$ days (average value)

$$K - X \pm {}^1/_2k = -3 \pm 1{}^1/_2.$$

Therefore the disease was being transmitted during a period extending from $d - 4{}^1/_2$ to $d - 1{}^1/_2$.

An approximate comparison with the other epidemic (1947 M1) is made by adjusting for the measuring-point d, giving an incubation period 24 hours longer. This gives the period of transmission from $d - 5{}^1/_2$ to $d - 2{}^1/_2$, strikingly similar to the other, with differences readily accountable to the use of a slightly less stable symptom for measurement. Too much importance ought not to be attached to the coincidence of results.

K : k *Ratios*

Epidemic 1947 M1:

$$K = nk$$

$$n = K \div k = 12 \div 2 = 6.$$

Had the epidemic continued, generation 6 might have been distinct.

Epidemic Wensleydale:

$$n = K \div k = 11{}^1/_2 \div 3 = \text{less than } 4.$$

By the method of measurement used it is doubtful if generation 4 would have been distinct from generation 5.

SUMMARY

A simple method of obtaining the date of infection in cases of some communicable diseases is provided by the serial interval and the incubation period.

The method can be extended to discover the period of transmission and its vagaries by a study of the inherent variability of the serial interval.

The importance of the measuring-point, and the principles guiding its wise selection are discussed and illustrated.

The relationships determining epidemic pattern are analysed, and a demonstration is given of the use of model charts of ideal epidemics.

The principles discussed are illustrated by the analysis of two small epidemics of measles.

I wish to thank the numerous people who have helped, especially my staff, my colleagues, and our patients, and Dr. Robert Knox and his colleagues, and Dr. Allan McFarlan, Prof. Major Greenwood, and Prof. G. S. Wilson, for much valuable criticism and encouragement. I am indebted to the Medical Research Council for financial and other assistance.

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[2] Pickles, W. N. (1939) Epidemiology in Country Practice. Bristol.

> "... In exploring the world of medicine the student should be guided in methods of map reading, but his knowledge of detail should lean to the three-miles-to-the-inch scale rather than a mile to the inch. There must be left to postgraduate study and training the preparation of the doctor for his special vocation in medicine. Above all, since medical knowledge is ever expanding, the undergraduate curriculum must favour the acquisition of enduring habits of work and thought and of enthusiasm for study."—Prof. HENRY COHEN, at King's College Hospital. (*Medical Press*, Oct. 27, p. 360.)

RAPID DISINFECTION OF CLEAN UNWASHED SKIN

FURTHER EXPERIMENTS

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With the technical assistance of E. VINCENT

THE rapid disinfection of unwashed skin, experimen ally infected with bacteria, has been investigated in previous inquiry, which showed that 2% iodine in 70 alcohol disinfected more rapidly than any of the oth substances tested (Gardner and Seddon 1946). Furth experiments on the same lines are described here.

EXPERIMENTAL METHODS

About a dozen circular areas 1 in. in diameter on the shav but not specially washed skin of the forearm are succ sively infected and disinfected. The area is first swabbed a bacterial suspension of known density, and when dry treated with the disinfectant for a given time either by s application, if a very short action is proposed, or with of sterile lint soaked in the disinfectant. In the latter the time of exposure of the bacteria to the disinfecta reckoned as the time of application of the disc plus the taken for the skin to dry after removal of the disc. In the of swab-application the time is reckoned from the first we of the whole area to the moment when the area looks A sterile swab moistened with sterile broth is then ru all over the area and immediately streaked over the su of an agar plate.

A control area, treated with bacteria but not with d fectant, is included in the experiment; and, when stro "bacteriostatic" substances are being used, a comb control for bacteriostatis is used: an uninoculated are treated with the disinfectant; and, when the area has d a moist swab is rubbed over it and then streaked on surface of an agar plate. Another area, treated with bact only and then dried, is swabbed, and the swab is streake over the surface of the same agar plate. If full growth t place on incubation, it is clear that the amount of disinfect transferred by the swab to the agar is insufficient to prev free development of the bacteria.

The aim being practical rather than theoretical, the [illegible] looked for is the virtually complete killing of the bacter "virtual" disinfection. The controls must give a [illegible] confluent growth, or at least densely set colonies as [illegible] at 50,000 or more; and a test plate is recorded as "virtu disinfected" when it shows less than 6 colonies of the t microbe. Colonies of contaminating organisms or of spor bacilli from the skin are disregarded. "Virtual disinfectio therefore allows the survival of not more than 1 in 10,000 the microbes applied to the skin. But, since the final exami tion is of a sample, not of the whole, and can only be appl to the whole with reservations, a higher standard—i.e., colonies at all on the great majority of plates and o one or two on any plate—was demanded in the chief fi experiments.

In the great majority of the experiments *Ps. pyocyanea* w used in place of the epidermal white cocci mostly employ in the previous work. To the rapid action of strong dis fectants *Ps. pyocyanea* is at least as resistant as cocci, wher to the slow action (bacteriostatic or slowly bactericidal) low concentrations it is much more resistant, and it is theref far less likely to be inhibited on the test platings by tra of disinfectant carried over on the swabs.

IODINE IN ETHYL ALCOHOL

Continuation of our previous work (Gardner an Seddon 1946) has confirmed that alcoholic solutions iodine are an extremely rapid means of disinfecting sk areas for surgical incisions or punctures. The skin ne not—indeed should not—be previously washed.

The method was recommended by Grossich in 19 and gained rapid support on all sides (Waterhouse ar Fenwick 1910, Kolle et al. 1931). It was the routi method at least in some of the great London hospita by 1911, though it was usually preceded by scrubbin

TABLE I—DESTRUCTION OF *Ps. pyocyanea* ON SKIN BY IODINE IN 70% ETHYL ALCOHOL

Iodine % (in 70 % ethyl alcohol)	Length of application											
	15–20 sec.			30 sec.			1 min.			2 min.		
	No. of tests	Virtually disinfected*		No. of tests	Virtually disinfected*		No. of tests	Virtually disinfected*		No. of tests	Virtually disinfected*	
		No.	Per 10		No.	Per 10		No.	Per 10		No.	Per 10
2·0	20	20	*10·0*	..	..	..	..	..	..	..	..	..
1·0	30	30	*10·0*	30	30	*10·0*	..	..	..	..	..	..
0·5	30	15	*5·0*	30	30	*10·0*	..	..	..	..	..	..
0·35	..	..	..	30	23	*7·7*	..	..	..	..	..	..
0·25	..	..	..	30	24	*8·0*	..	..	..	..	..	..
0·125	..	..	..	30	10	*3·3*	..	..	..	..	..	..
0·0	..	..	..	30	10	*3·3*	20	8	*4·0*	20	20	*10·0*

* > 99·9 % killed.

Note.—Applied wet on lint for all times over 15–20 sec.—e.g., for 30 sec. thus: 10 sec. application on lint + 20 sec. to dry.

h soap and water, a procedure discountenanced by ich as reducing the effectiveness of the disinfectant. more than occasional and mild trouble from iodine-sitiveness seems to have been encountered.

The present experiments (table I) show that 1% iodine 70% ethyl alcohol is effective in the least time taken the disinfectant to dry on the skin—i.e., 15–20 sec. the solution is allowed to act in the wet state for sec., 0·5% iodine is sufficient. If the time can be tended to 2 min., no iodine is needed, since 70% cohol alone gives disinfection in that time.

ZEPHIRAN

This kationic detergent solution of high-molecular yl-dimethyl-benzyl-ammonium chlorides, introduced Domagk (1935) and Hornung (1935), is a pleasant-ling fluid which makes clear solutions in water and not irritate the skin.

our previous work (Gardner and Seddon 1946) a tests indicated that at 25–100% concentration in 'Zephiran' disinfected skin areas, previously cted with *Ps. pyocyanea*, within 1½ min., which is the time it generally takes for such concentrated tions to dry on the skin. Shorter exposures could refore not be tested; and consequently great rapidity not be claimed for aqueous solutions. In the present investigations concentrations lower than 25% proved ineffective in 1½ min. By prolonging the exposure to 5 min. disinfection was obtained with a 10% solution.

Since zephiran and similar substances act more rapidly and intensely on gram-positive cocci than on gram-negative rods, the table of actions of both aqueous and alcoholic solutions on *Ps. pyocyanea* may be taken as guaranteeing at least as effective action on other non-sporing bacteria (contrast the action of ether below).

ZEPHIRAN IN 70% ETHYL ALCOHOL

Starting from the bottom of the right half of table II one sees again that 70% ethyl alcohol alone was effective in 2 min., and that the addition of zephiran up to 10% increased the proportion of areas disinfected in a given time but did not give complete virtual disinfection in less than 2 min.

When, however, the zephiran concentration was increased to 30% (note that zephiran is itself an approximately 10% watery solution and the solids in the final solution are consequently only 3%), virtual disinfection was achieved in about ½ min. in 28 out of 30 tests. The 2 failures showed a dozen colonies and about 150 colonies of *Ps. pyocyanea*. But, since of the remaining 28 plates only 2 showed a single colony each and the rest none, it is highly probable that the 2 failures were of the nature

TABLE II—DESTRUCTION OF BACTERIA ON SKIN BY ZEPHIRAN

Zephiran %	Aqueous solutions												In 70 % ethyl alcohol								
	Length of application (min.)												Length of application (min.)								
	1·5			2·0			5·0			6·5			0·5			1·0			2·0		
	No. of tests	Virtually disinfected		No. of tests	Virtually disinfected		No. of tests	Virtually disinfected		No. of tests	Virtually disinfected		No. of tests	Virtually disinfected		No. of tests	Virtually disinfected		No. of tests	Virtually disinfected	
		No.	Per 10		No.	Per 10		No.	Per 10		No.	Per 10		No.	Per 10		No.	Per 10		No.	Per 10
100	6	6	*10·0*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	30	28	*9·3*	..	..	..	..	..	..
25	6	6	*10·0*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	10*	0	*0·0*	10	9	*9·0*	(12*)	(12)	(*10·0*)	..	..	..	50	28	*5·6*	30	27	*9·0*	10	10	*10·0*
5	..	..	..	10	3	*3·0*	1*	1	..	20	10	*5·0*	39	27	*6·9*	..	..	..	..	..	..
2	..	..	..	..	..	..	1*	1	..	..	..	..	20	9	*4·5*	..	..	..	..	..	..
1	..	..	..	..	..	..	..	..	..	..	..	..	10	4	*4·0*	..	..	..	..	..	..
0	..	..	..	..	..	..	..	..	..	..	..	..	30	10	*3·3*	20	8	*4·0*	20	20	*10·0*

* = Test done with epidermal coccus. All the others done with *Ps. pyocyanea*.
( ) = Tests possibly unreliable, since the controls showed some bacteriostasis.

TABLE III—DESTRUCTION OF *Ps. pyocyanea* ON SKIN BY MIXTURES OF DI-ETHYL-ETHER AND ETHYL ALCOHOL

Mixture %			Length of application					
			20 sec.			30 sec.		
Ether	Alcohol	Water	No. of tests	Virtually disinfected		No. of tests	Virtually disinfected	
				No.	Per 10		No.	Per 10
100	0	0	17	17	*10·0*	23	23	*10·0*
30	70	0	..	..	..	30	29	*9·7*
20	80	0	20	7	*3·5*	30	30	*10·0*
10	90	0	..	..	..	30	30	*10·0*
15	70	15	30	8	*4·0*	30	28	*9 3*

Note.—The normal cocci of the skin survived in many cases (see text).

of technical errors, and that the whole result can be taken as satisfactory. It is to be noted that the quantity of the disinfectant applied by swabbing with a tiny moistened swab is very small. A more liberal application and a slight prolongation of the time of action to 45 sec. should ensure regular virtual disinfection.

We may take it, then, that the rapidity of the action of 30% alcoholic zephiran is little less than that of 0·5–2·0% iodine in 70% alcohol, and therefore we have in this solution a feasible substitute for iodine, to which a few people are hypersensitive.

CETRIMIDE (C.T.A.B. OR CETAVLON)

We showed earlier (Gardner and Seddon 1946) that aqueous solutions of cetrimide (' Cetavlon ') at 5% and 2·5% were incompletely disinfectant in $1^1/_2$ min. to areas treated with *Ps. pyocyanea.* After verifying the inadequacy of 5% aqueous solutions, which in this experiment disinfected 8 of the 10 areas tested, and represent the strongest concentration easily procurable in water, solutions in 70% and 97% ethyl alcohol were examined for their rapid disinfecting power (30 sec.). It should be mentioned that there is no appreciable difference in the antibacterial actions on the skin of 70% and 97% alcohol containing nothing in solution.

In alcohol a 10% solution of (solid) cetrimide can easily be made, and it was found that such a solution in 97% alcohol disinfected in 30 sec. all of 24 areas infected with *Ps. pyocyanea,* and in 70% alcohol 23 out of 24, the single failure being probably attributable to a technical error.

It may therefore be considered that 10% cetrimide in 70% alcohol, as a rapid disinfectant, nearly equals the performance of alcoholic iodine.

Similar experiments with a 5% solution of cetrimide in 70% alcohol showed a partial disinfection, only 8 out of 20 areas being virtually disinfected in 30 sec. Likewise the effect of 2% solutions in the same time was incomplete.

DI-ETHYL-ETHER

The destruction of *Ps. pyocyanea* on the skin by ether and by mixtures of ether and alcohol is shown in table III. Ether alone was successful in 20 sec., but neither of the two alcohol-ether mixtures tried for this time gave satisfactory results. In $^1/_2$ min., however, two of the mixtures gave complete disinfection, whereas the other two gave only a very small proportion of failures, which might well have been due to technical errors.

It was noted, however, that on the platings from skin areas treated with ether or with the mixtures, unexpected crops of white colonies of staphylococcus developed, which seemed to show that the normal cocci of the skin were surviving a treatment that eliminated *Ps. pyocyanea.*

To investigate this possibly selective action of eth bactericidal tests were performed in vitro, the resu of which are shown in table IV. From these it is cl that the two gram-negative microbes are killed m rapidly than staphylococci.

As regards the epidermal coccus used in the bactericid tests it was not realised at the time how slowly it gro in blood-broth (the test medium), and there may possib have been a minimal growth, invisible to the naked e in some of the test cultures recorded as 0. With t other three organisms any growth that occurred w clear enough to simple inspection; hence the records experiments with them are reliable.

To sum up: in the in-vitro bactericidal test p ether does not kill even small doses of cocci in 30 se nor large ones in 4 min., whereas it kills large doses *Ps. pyocyanea* and *Bact. coli* in a minute and small do in $^1/_2$ min. It follows that the skin-disinfecting action o *Ps. pyocyanea* shown in table III must not be interpret in general terms. Cocci would almost certainly ta longer to kill; and, if many were present the time mig be impracticably prolonged.

MERCURY PREPARATIONS

Mercuric chloride at 1 in 1000 in water acting f $1^1/_2$ min. (the least time it took to dry on the skin) fail to achieve virtual disinfection in 8 out of 10 skin are infected with *Ps. pyocyanea.*

' *Merthiolate* ' *tincture* (Lilly no. 99), containing 1·0 merthiolate, 0·1% monoethanolamine, 50% ethyl alcoho and a trace of eosin, did not, in 30 sec., virtually disinfe any of 10 areas infected with a white epidermal cocc With *Ps. pyocyanea* as the test organism only 2 out 10 areas showed virtual disinfection in 30 sec.; but 1 min. 11 out of 20, and in 2 min. all of 20, were di infected. It is, however, to be remembered that 70 alcohol disinfects in 2 min., and that 50% alcohol m be expected to have almost as strong an action.

Merthiolate solution (Lilly no. 45), a 0·1% solution water with 0·1% monoethanolamine, entirely failed disinfect *Ps. pyocyanea* on the skin in $1^1/_2$ min., and o disinfected 7 out of 20 areas in 5 min.

In all experiments with mercury preparations the platings were done on agar containing 0·1% sodiu thioglycollate to neutralise traces of the mercuri substance carried over with the sample inoculum. It i evident, as might have been expected from our knowledg of the very slow bactericidal action of mercurials in vitro that a rapid skin-disinfectant is not to be found amon them. It does not seem, therefore, that any mercurial i as useful for our purpose as most of the other substance whose actions are described here.

TABLE IV—THE BACTERIAL ACTION IN VITRO OF DI-ETHYL-ETHER

Time (min.)	Approximate no. of bacterial cells put into 5 ml. of ether											
	3×10^3				3×10^6				3×10^9			
	Ps. pyocyanea	*Bact. coli*	*Staph. aureus*	Skin coccus	*Ps. pyocyanea*	*Bact. coli*	*Staph. aureus*	Skin coccus	*Ps. pyocyanea*	*Bact. coli*	*Staph. aureus*	Skin coccus
0·5	0	0	+	+	0	0	+	0*	+	+	+	+
1·0	0	0	0	0	0	0	+	0*	0	0	+	+
2·0	0	0	0	0	0	0	+	0*	0	0	+	+
4·0	0	0	0	0	0	0	0	0*	0	0	+	+

* Results open to doubt (see text).
+ = Growth—i.e., not sterilised.
0 = No growth—i.e., sterilised.

CHLOROS

'Chloros' in 70% Ethyl Alcohol.—Chloros is said to represent approximately a 10% solution of chlorine in water, so that a mixture of 3 parts of chloros and 7 parts of ethyl alcohol would give about 3% of chlorine. It should be noted that a heavy deposit was formed on making the mixture, which was filtered before use. Ten areas treated with a suspension of *Ps. pyocyanea* were exposed to the filtered mixture for 30 sec. Of 10 areas so treated none was virtually disinfected, though the visible bacteria were very greatly reduced. A somewhat longer exposure would doubtless be successful, but it is clear that chlorine in this form is less effective than iodine.

Chloros in Aqueous Solution.—In our previous paper (Gardner and Seddon 1946) full-strength chloros was shown to be incompletely effective in $1^1/_2$ min. Further experiments, with exposures of 4–5 min. gave the following figures:

Chloros 100%: 20 tests with skin-coccus; 18 virtually disinfected.

Chloros 50%: 20 tests (10 coccus, 10 *Ps. pyocyanea*); all virtually disinfected.

Chloros 25%: 10 tests with the coccus; only 3 virtually disinfected.

Prolongation of the time of treatment with the 25% solution to 9 min. only slightly improved the results to [illegible] virtual disinfections out of 10 tests. Thus chloros at 50% is effective in 5 min. Possibly the 2 failures out of [illegible] with 100% chloros were experimental errors.

DETTOL IN 70% ALCOHOL

Undiluted aqueous 'Dettol' was shown (Gardner and Seddon 1946) to be unsuccessful in killing epidermal cocci on the skin in the 5 min. which it takes to dry. Further tests showed that even 15 min. exposure was not enough. Dilution with water 1 in 2, 1 in 4, and 1 in [illegible] did not improve the results. But a great reduction in the viable bacteria took place in 5 min. with 100% and [illegible] dettol; hence it seemed possible that alcoholic solutions might show a rapid action. Tests were therefore made with a mixture of 30 parts dettol and 70 of ethyl alcohol, using both *Ps. pyocyanea* and a skin coccus as test organisms. In neither case was virtual disinfection of all areas attained in 30 sec., though a high proportion were disinfected; and one area out of [illegible] (*Ps. pyocyanea*) showed growth even after a minute's application. Thus a rapidity of action equal to that of alcoholic iodine was not observed.

MISCELLANEOUS EXPERIMENTS

Petrol, as sold in garages in England in May, 1947, showed no obvious disinfecting power on *Ps. pyocyanea* in either 30 sec. or 2 min. (10 areas tested in each case).

Acetone, similarly tested for the same time, was ineffective, though it caused a moderate reduction in the number of living microbes on the skin.

Propyl alcohol.—A 50% solution, as used for disinfecting the shaved skin of animals in some laboratories, was compared with 70% ethyl alcohol in parallel tests when acting for $^3/_4$ min. or 2 min., an epidermal coccus being the test organism. In all experiments the propyl alcohol proved the less efficient in a given time. But it has quite a strong action, and if applied for 3–5 min. it would probably disinfect well. It is alleged to be less irritating than ethyl alcohol when repeatedly applied to an animal's skin.

Brilliant Green and Crystal Violet, 1% of each in 75% Methylated Spirit.—This mixture is used at the Wingfield-Morris Orthopædic Hospital, Oxford, for maintaining the sterility of skin areas. It is not used for rapid disinfection.

Experiments showed that, as expected, it failed in 30 sec. to disinfect 10 out of 10 skin areas experimentally infected with *Ps. pyocyanea*; and when applied for 30 sec. and left for 5 min. in the dry state it was not completely successful, only 3 of 5 areas so treated being virtually disinfected. But when, after application wet for 30 sec., it was left dry on the skin for 30 min., all 5 areas so treated were virtually disinfected (though one area, which yielded 5 colonies, was only just up to the standard).

It may be judged from these experiments that this dye mixture, if applied from time to time to skin which is then kept covered with sterile dressings, can produce and maintain a state of virtual disinfection.

DISCUSSION

Though great rapidity of skin disinfection is indispensable only in certain circumstances, such as emergency incisions and the inoculation of many persons in a short time, there is little object in using slow methods for any surgical operation when quick ones are as good or better. The washing or scrubbing of the skin, and various other methods of preparation, sometimes extending to the day before the operation, seem to make altogether unnecessary demands on the time and energy of nurses, for there is no evidence that they achieve any greater sterility of the skin than does the single $^1/_2$ min. application of an effective disinfectant immediately before the operation (Price 1938).

Prof. H. J. Seddon (private communication), acting on the evidence of our first publication, has used 2% iodine in 70% alcohol for some two years in orthopædic operations, applying it only once just before the operation, without washing the skin except when it seemed unhealthy. No infections attributable to infected skin have occurred at operations during that time, and only an occasional mild dermatitis has been caused by the iodine.

There seems little justification for using slow disinfectants, such as merthiolate or the flavines (Gardner and Seddon 1946). These are usually applied in alcoholic solution, and it has been shown that ethyl alcohol alone will virtually disinfect skin in about 2 min. (table I). There is no evidence that slow disinfectants dissolved in it have any useful effect at all.

SUMMARY

The power of 2% iodine in 70% ethyl alcohol to achieve virtual disinfection of flat areas of unwashed clean skin in $^1/_2$ min. or less is confirmed, and it is shown that, if a full 30 sec. is allowed, the iodine may be reduced even to 0·5%.

The detergents, zephiran 30%, and cetrimide 10%, both in 70% ethyl alcohol, give satisfactory disinfection in 30–45 sec.

Ethyl ether, chloros, various mercury preparations, and some other substances have either a slower or an otherwise imperfect disinfecting power.

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". . . A rough estimate of problem families for England and Wales gives 80,000 containing approximately 300,000 children. This is arrived at using the average incidence of Rotherham (3 per 1000), Luton (2 per 1000), and Herefordshire (1 per 1000). Thus it seems likely that at least 60,000 children now being cared for by local authorities and voluntary bodies away from their parents come from problem homes, being about one-fifth of the total children living in comparable circumstances."—Dr. C FRASER BROCKINGTON, addressing the Royal Institute of Public Health and Hygiene on Oct. 27.

POTENCY AND “TOXICITY” OF SOME SYNTHETIC ŒSTROGENS

CLINICAL ASSESSMENT

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STILBŒSTROL, dienœstrol, and hexœstrol were synthesised in 1938 by Dodds and his associates (1938a and b, Campbell et al. 1938). These compounds are now extensively used clinically, and it has become customary to assume that stilbœstrol, though a highly effective œstrogen, readily produces “toxic” symptoms, whereas dienœstrol and hexœstrol, though possibly equally potent, are less “toxic.” There have, however, been few serious attempts to determine or compare the potency of these substances in man.

Of forty papers reporting the use of stilbœstrol at the menopause, in menstrual disorders, or to inhibit lactation, only seven refer to its strength in relation to that of the natural œstrogens, though in none of these did the methods of assessment seem to justify definite conclusions.

We have found only nine records of the clinical use of hexœstrol, and five of dienœstrol. In these it is generally agreed that both show a low incidence of “toxicity,” and that hexœstrol is less potent than stilbœstrol (values range from a tenth to a third), when given by mouth. In only two of the reports on dienœstrol is it compared with stilbœstrol. Barnes (1942) states that it is ten times more effective than stilbœstrol in suppressing lactation, and Rakoff et al. (1947) suggest that the action of dienœstrol in inhibiting pituitary activity is greater than that of stilbœstrol, whereas stilbœstrol is more effective in its action on the endometrium and vaginal epithelium.

Other œstrogens, apart from the naturally occurring substances œstradiol, œstrone, and œstriol, have been used clinically. One of these, bis-dehydro-doisynolic acid (Meystre and Miescher 1944) has been considered in this investigation.

METHOD

The œstrogen was given by mouth in daily doses for a fortnight to induce “withdrawal bleeding” within fourteen days of the last dose, the usual interval being from two to four days. The first course consisted of a “sighting” dose (usually 2 mg. daily in the case of stilbœstrol). Depending on whether the response was positive or negative, the daily dose of the second course (the “first bracketing” dose) was either lowered or raised—usually halved or doubled. The daily dose of the third course (the “second bracketing” dose) was similarly adjusted according to the response of the first bracketing dose. In this way a “therapeutic unit” was obtained, being the mean of the daily doses of two courses, one of which consisted of the highest, and the other of the lowest, daily dose to fail or succeed, respectively, to produce a withdrawal bleeding.

The patients selected had primary amenorrhœa, or secondary amenorrhœa of at least some months' standing.

In general an attempt was made first to determine the therapeutic unit of stilbœstrol, and subsequently the therapeutic unit of one or more of the other œstrogens, on the same patient.

The œstrogens used in the investigation were stilbœstrol, dienœstrol, hexœstrol, and bis-dehydro-doisynolic acid.

RESULTS

Of the 168 patients studied 146 had seconda amenorrhœa and 22 primary amenorrhœa; 997 cour of œstrogen were given; 79 therapeutic units of st bœstrol, 48 of dienœstrol, 30 of hexœstrol, and 19 doisynolic acid were obtained.

A wide range of therapeutic units was encountered f each œstrogen in different patients. The series of ca was consequently too small to permit the mean the peutic unit to be used as a basis for statistical comparis of the various œstrogens. Thus it was impossible take the average of all the 79 therapeutic units stilbœstrol, for instance, and compare it with t average of all the 48 therapeutic units obtained f dienœstrol.

The ratio between the effective doses of any pair œstrogens determined on individual patients was, ho ever, found to be much more uniform. The statistic analysis of the results is therefore based on the logarith of these individual ratios, the comparisons being ma with the therapeutic unit of stilbœstrol expressed unity. In other words, the effect of each of the oth œstrogens was compared with that of stilbœstrol on t same patient. This was possible in 75 cases. The resul were as follows:

Substance	*No. of comparisons*	*Mean ratio*	*Fiducial limits o error (P = 0·05*
Dienœstrol	36	0·261	0·205–0·334
Hexœstrol	23	0·056	0·042–0·074
Doisynolic acid	16	0·214	0·147–0·311

From this it will be seen that dienœstrol is about quarter, doisynolic acid about a fifth, and hexœstr about an eighteenth, as potent as stilbœstrol.

Though the mean therapeutic unit is of litt significance, some interest attaches to the approxima median therapeutic unit (the daily dose on which ha the patients bled), for it may give some indication for th choice of the sighting dose in subsequent investigation For stilbœstrol it was 1·5 mg., dienœstrol 2·5 mg hexœstrol 10 mg., and doisynolic acid 2·5 mg.

“*Toxicity.*”—It was hoped to collect sufficient data calculate regression lines of “toxicity” on dosage each substance, so as to compare accurately “toxicity” of each œstrogen at various dose levels (By this means the percentage incidence of “toxicity” at various dose levels is plotted as a curve with percentage “toxicity” as ordinates and dose, or log: dose as abscissæ.) Unfortunately this has been possible only in the case of stilbœstrol. Here the probit-of-percentage-“toxicity”/log dosage relationship was found to be linear, with a very good fit, giving a regression lin

$$y = 1{\cdot}388366\,x + 2{\cdot}196176.$$

The departure from linearity gave a χ^2 value of 4·0317 on ten degrees of freedom, giving a probability of 0·90 0·95 of linearity. This type of relationship is a commo biological one and in this case indicates that “toxicity” depends virtually on dosage. No similar relation coul be shown for the other substances, because of the smalle incidence of nausea in relation to the size of the serie but probably a larger series would reveal a relatior of the same type.

Because of this failure to express “toxicity” weight for weight in the case of the other œstrogens, a simple method has been used comparing the “toxicity” o effective doses. This comparison has been restricted t patients in whom uterine bleeding has been produced Since care has been taken throughout the investigation, to exceed the minimal effective dose as little as possible, the comparison is as near as one can get to a statement of the “toxicity” of doses of equivalent therapeutic effect.

The numbers of patients responding to treatment with each substance, together with the numbers complaining nausea at any time during the treatment, were as follows:

Substance	No. of patients responding	No. of patients nauseated
Stilbœstrol	92 ..	36
Dienœstrol	63 ..	4
Hexœstrol	40 ..	2
Doisynolic acid	26 ..	3

The results of a series of χ^2 tests on these data were as follows:

Substance	χ^2	df	P
Stilbœstrol v. dienœstrol ..	19·310 ..	1 ..	0·001
Stilbœstrol v. hexœstrol ..	14·220 ..	1 ..	0·001
Stilbœstrol v. doisynolic acid	5·783 ..	1 ..	0·01–0·02
Stilbœstrol v. all others ..	32·284 ..	1 ..	0·001

These results indicate a highly significant difference between the "toxicity" of stilbœstrol and those of dienœstrol and hexœstrol. The lower degree of statistical significance attaching to the difference between stilbœstrol and *doisynolic acid is almost certainly due to the* smallness of the series. It therefore seems clear that, to produce equivalent clinical effects with stilbœstrol, we must run the risk of encountering a much greater incidence of nausea than with any of the substances considered.

DISCUSSION

Choice of End-point

Œstrogen withdrawal bleeding in amenorrhœa has been chosen as the end-point for this investigation. The mechanism involved—i.e., the effect of œstrogen on the endometrial vessels—represents only one level of œstrogenic response. There are, however, others, such as the replacement of the waning activity of the ovary in the treatment of the menopausal syndrome; conversion of an atrophic to an œstrous type of vaginal smear; suppression of lactation: and arrest of the symptomatic progress of carcinoma of the prostate. It would therefore be desirable to compare the œstrogens used in the present investigation using end-points devised to demonstrate these other levels of œstrogenic response, for it is not improbable that the ratio of doses of the various œstrogens would differ for the relief of menopausal symptoms or the suppression of lactation from that which we have recorded for the production of withdrawal bleeding.

We have, however, failed to devise satisfactory end-points for these other conditions, for the following reasons:

(1) The manifestations of the menopausal syndrome are entirely subjective and therefore difficult to assess quantitatively. It might, however, be possible to persuade the patient to keep a record of her daily hot-flush count, and to use this as the end-point. To do so it would be necessary to establish a base-line by giving the patient inert control tablets for a fortnight. This would be followed by alternate therapeutic courses to determine the minimal effective dose of at least two of the œstrogens to be tested. Alternating with each therapeutic course control tablets would have to be given to allow the hot-flush count to return to the base-line. The many incalculable factors which might modify the hot-flush count; the length of time necessary to establish the therapeutic unit of two or more œstrogens in a condition in which the level of response might alter as time goes on; and the disinclination of the patient to submit to periodic exacerbation of her symptoms due to the alternating courses of control tablets, render this method, in our opinion, impracticable.

(2) The end-point in the vaginal smear would be the conversion of an anœstrous into an œstrous smear. Many postmenopausal women show an anœstrous smear. In few, however, is the smear sufficiently labile to undergo the necessary change, and then to revert to the anœstrous condition on control tablets, to enable one in practice to establish therapeutic units of at least two œstrogens in a reasonable period of time.

(3) Suppression of lactation seems to us an unsuitable method for the clinical assessment of œstrogens, for the administration of only one course of œstrogen is possible, and that either does or does not suppress lactation. To establish the minimal effective dose of one œstrogen, therefore, would require a large series of cases, and to compare the effect of another œstrogen would necessitate the use of another equally large group of patients. The same is true of carcinoma of the prostate.

For these reasons, therefore, we have found it possible to use only one end-point, the induction of bleeding in amenorrhœa, and it should be emphasised that our results refer only to this one level of œstrogenic response.

Suitability of Œstrogen Withdrawal Bleeding in Amenorrhœa as an End-point.—Not only did we conclude that we could devise no other suitable end-point than the production of bleeding in amenorrhœa, but also we were at one time doubtful whether even this would give significant results. First, there was the probability of spontaneous periods occurring as a coincidence after a therapeutic course and consequently being recorded as withdrawal bleedings. Secondly, it seemed likely that the level of response in any one patient might alter during the investigation, which lasted sometimes for more than a year. To test this possibility the same dose of stilbœstrol was readministered to individual patients on 74 occasions, on 59 of which the response was unchanged, though several courses of œstrogen, and sometimes many months, intervened between the original course and readministration. On the 15 occasions where the response was altered, 14 were in cases in which the dose concerned probably represented the bleeding threshold of the patient. In these cases larger doses consistently produced bleeding, and smaller ones consistently failed to do so. In one case only was the response so uncertain as to make it impossible to determine a bleeding threshold. Finally, we were doubtful about the justification for including cases of primary and secondary amenorrhœa in the same series, for it was felt that the cause of the condition might be fundamentally different in these two groups. Actually there was no significant difference between the mean therapeutic unit for primary and secondary amenorrhœa (2·1 and 2·2 mg. of stilbœstrol respectively). When the results of the investigation were analysed, Dr. Emmens made the following statement: "The degree of precision of the comparisons, as revealed by the fiducial limits of error shown, is of the order usually attained in biological assays in which moderately large groups of animals are used." This seems to justify our choice of this particular end-point for comparing the potency of œstrogens in man.

SUMMARY

A method is described for comparing the potency of œstrogens in man. It consists in giving the œstrogen daily by mouth in fourteen-day courses to amenorrhœic women and recording whether œstrogen withdrawal bleeding takes place.

The results obtained indicate that dienœstrol is about a quarter, doisynolic acid about a fifth, and hexœstrol about an eighteenth, as potent as stilbœstrol.

Investigation of the incidence of "toxicity" indicates that stilbœstrol is more likely to produce nausea in therapeutic doses than are dienœstrol, doisynolic acid, and hexœstrol.

Reasons are given for choosing this end-point, and for the failure to devise any other suitable method of assessment at different levels of œstrogenic response, such as the relief of menopausal symptoms, the production of an œstrous vaginal smear, and the suppression of lactation.

We wish to thank Sir Jack Drummond, F.R.S., for the facilities he has put at our disposal to enable us to carry out this work; and Dr. W. L. M. Perry for help on the statistical aspects of the investigation after the departure of Dr. Emmens for Australia.

The œstrogenic preparations used in these experiments were supplied by British Drug Houses Ltd., Messrs. Ciba Ltd., and Boots Pure Drugs Co. Ltd.

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ACTIVITY OF SOME SYNTHETIC ŒSTROGENS DETERMINED BY EXPERIMENTS ON RATS

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WORKERS on the relative activity of three synthetic œstrogens—stilbœstrol, dienœstrol, and hexœstrol—using ovariectomised rats or mice, have published widely different results. For example, Emmens (1938) reported that dienœstrol given by mouth to mice was four times as active as stilbœstrol, whereas Kemp and Pedersen-Bjergaard (1943) found it to have half its activity. Campbell et al. (1939) found the activity of hexœstrol given by mouth to be 80% that of stilbœstrol, whereas Kemp and Pedersen-Bjergaard (1943) found it only 10%.

Bishop et al. (1948) have established the relative clinical efficiencies of these three œstrogens, and it seemed desirable to try and correlate the clinical and biological results. Because of the conflicting results previously reported, we have repeated the assays, using a sufficiently large number of animals to permit a reliable estimate to be made of the error of the observations. We have also included in some of our assays a new water-soluble synthetic œstrogen, potassium hexœstrol sulphate, and record our results here.

Inbred ovariectomised rats of the Wistar strain 7–8 weeks' old and weighing about 100 g. at ovariectomy were used. After ovariectomy the rats were rested for about ten days, and thereafter vaginal smears were examined daily for the next ten days. A sample of the vaginal cells was removed with a round-ended metal spatula moistened with a drop of water before insertion. A thin smear was made on a glass slide, fixed in methyl alcohol, and stained with a 1% aqueous solution of methylene-blue. A smear was scored as positive if it consisted exclusively of cornified cells, or of cornified cells with sporadic nucleated epithelial cells. Animals which had been shown to be in anœstrous throughout the whole period of smearing were used for assay once every two weeks.

TABLE I—RELATIVE ACTIVITIES OF ŒSTROGENS GIVEN BY MOUTH

Œstrogen	Present investigation		Kemp and Pedersen-Bjergaard (1943)	Campbell et al. (1939)
	Activity	P = 0·95 limits of error	Activity	Activity
Stilbœstrol	100	(assumed)	100 (assumed)	100 (assumed)
Hexœstrol	10	8·5–11·7	10	80
Dienœstrol	68	63–73	100	100
Potassium hexœstrol sulphate	7·3	6·7–8·0	—	—

ORAL ASSAYS

Stilbœstrol, hexœstrol, and dienœstrol were give in arachis oil, and potassium hexœstrol sulphate i aqueous solution.

The arachis-oil solutions were prepared by dissolvin a weighed quantity of the œstrogen in acetone and addin the acetone solution to a known volume of arachis oi The vessel containing the mixture was surrounded wit a jacket of warm water, and a rapid stream of nitroge was passed through to mix the solution and drive o the acetone. Further dilutions were prepared from th stock solution, mixing being in all cases effected with stream of nitrogen. Oil solutions were prepared fresh for each assay and were stored during the te period in a refrigerator; aqueous solutions potassium hexœstrol sulphate were prepared fresh each day.

The required dose for each animal was divided in three equal parts, and each part was given in a volu of 0·5 ml. once daily by stomach-tube; dosing w therefore spread over three days. Several doses of ea sample were given, the doses being so adjusted that th logarithms were in arithmetical progression. Th simplified subsequent arithmetic for the calculation potencies. In the earlier assays smears were made the fourth, fifth, and sixth days of the assay; b since no additional information was obtained from t sixth-day smears, these were discontinued. A positi smear obtained on either day or on both days w recorded as a positive response.

TABLE II—RELATIVE ACTIVITIES OF ŒSTROGENS GIVEN B SUBCUTANEOUS INJECTION

Œstrogen	Series I		Series II		Series III	
	Activity	P = 0·95 limits of error	Activity	P = 0·95 limits of error	Activity	P = 0·9 limits error
Stilbœstrol	100	(assumed)	100	(assumed)	100	(assumed
Hexœstrol	64	61–68	64	60–68	70	66–74
Dienœstrol	26	24–27·4	27	25–29	33	31–35
Potassium hexœstrol sulphate	0·98	0·91–1·05	—	—	—	—
Œstrone	—	—	30	28–32	28	26–29

The total number of positive responses in each dos group was summed and expressed as a proportion of t total number of rats receiving that dose. From th results potencies and limits of error were calculat by the method for quantal responses described Gaddum (1933).

A few *preliminary* tests were made with each œstrog to determine the optimal dose range. The animals we then divided into sufficient groups to allow each œstrog to be given at three dosage levels. In general the do used were greater than those used by Campbell et (1939).

Results.—The mean potencies calculated from the assays, and their fiducial limits, are shown in table together with the potencies found by other worke The potencies of hexœstrol, dienœstrol, and potassiu hexœstrol sulphate were all expressed relative to sti bœstrol, which was assigned the value 100. The tot number of observations contributing to the mea potencies was for stilbœstrol 256, hexœstrol 86, dienœstr 341, and potassium hexœstrol sulphate 313.

TABLE III—RELATIVE SUBCUTANEOUS POTENCIES OBTAINED BY VARIOUS WORKERS

Œstrogen	Present investigation			Kemp and Pedersen-Bjergaard (1943)	Campbell et al. (1939)
	I	II	III		
bœstrol ..	100	100	100	100	100
xœstrol ..	64	64	70	80	122
nœstrol ..	26	27	33	30	87
rone ..	—	30	28	36	43

SUBCUTANEOUS ASSAYS

Three series of assays were made with aqueous solutions. the first series stilbœstrol, hexœstrol, dienœstrol, and tassium hexœstrol sulphate were compared; in the cond and third series œstrone, hexœstrol, and dienœstrol re compared with stilbœstrol.

The preparation of the animals and the preparation and oring of the smears were the same as described above.

The aqueous solutions of stilbœstrol,. hexœstrol, nœstrol, and œstrone were prepared by diluting ith distilled water stock solutions in absolute alcohol; queous dilutions were prepared every day, and stock lutions freshly made for each test. The stock solutions re stored in a refrigerator during the period of the st, and the aqueous dilutions were similarly stored tween the times of dosing. Aqueous solutions of potasm hexœstrol sulphate were prepared freshly each day.

The total dose for each animal was divided into six ual parts, and each part was given in a volume of 5 ml. on the morning and afternoon of three successive ys. Smears were made on the fourth and fifth days. e results were treated as described above.

Results.—Three series of assays were made, each ies consisting of a large number of observations. In e first series hexœstrol, dienœstrol, and potassium strol sulphate were compared with stilbœstrol, the y of which was assigned the value 100. In the and third series œstrone was substituted for ium hexœstrol sulphate.

he results obtained in the three series of assays are n separately in table II to show the order of the ement which may be expected in separate assays this type. The mean potencies compared with the ues obtained by Kemp and Pedersen-Bjergaard 43) and by Campbell et al. (1939) are given in table III. all cases the results are shown relative to stilbœstrol, hich has been assigned the value 100.

DISCUSSION

Our findings that the relative potencies of stilbœstrol, nœstrol, and hexœstrol given by mouth are 100, and 10 do not agree with those of Campbell et al. 939), who found hexœstrol almost as active as stilstrol. They do, however, agree with those of Kemp d Pedersen-Bjergaard (1943).

This is the more interesting since the mode of adminiation used by us duplicated that used by Campbell al., but differed from that used by Kemp and ersen-Bjergaard. It seems from this that the mode administration—i.e., solvent, arrangement of doses, —may have less influence on relative potency than s been assumed. It is also interesting to note that our sults are in close agreement with the clinical results ported by Bishop et al. (1948).

Similarly, our results for the relative subcutaneous tencies show close agreement with those obtained by emp and Pedersen-Bjergaard, though they differ from ose reported by Campbell et al.

SUMMARY

Large-scale experiments designed to assess the œstronic activity of some synthetic œstrogens have been ade with ovariectomised adult female rats.

Hexœstrol given by mouth has only a tenth of the activity of stilbœstrol, dienœstrol two-thirds, and potassium hexœstrol sulphate a fourteenth. Potassium hexœstrol sulphate was given in aqueous solution; the others were dissolved in arachis oil.

Injected subcutaneously in aqueous solution hexœstrol has about two-thirds, dienœstrol less than a third, and potassium hexœstrol sulphate a hundredth of the activity of stilbœstrol. Œstrone has about the same activity as dienœstrol.

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RATE OF FLOW OF VENOUS BLOOD IN THE LEGS

MEASURED WITH RADIOACTIVE SODIUM

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VENOUS thrombosis has long been known to be influenced by three main factors, commonly known as Virchow's triad—changes in the constitution of the blood, damage to the blood-vessels, and disturbances of the circulation. The conception of phlebitis as a factor in thrombosis was introduced by John Hunter (1793), and Hayem (1889) first recognised the rôle played by the platelets. Baillie (1793), Laennec (1819), and others emphasised stasis of the blood as a factor in thrombosis, and Lancereaux (1875) postulated this law: "Thromboses are always found at the level of the points where the blood has the greatest tendency to stasis, that is, at the limit of the action of the forces of cardiac propulsion and thoracic aspiration." Though the first two of Virchow's three factors are now well established experimentally and recognised in clinical practice, the participation of the third has hitherto remained largely inferential.

The introduction of radioactive tracers, however, has made possible the direct measurement of the rate of blood-flow in a limb by introducing such a tracer at one point and determining its arrival at some other point with a suitably placed Geiger-Müller (G-M) counter sensitive to the type of radiation emitted. In the present study radioactive sodium, Na^{24}, was used to determine the rate of flow of venous blood up the leg in normal people. The findings are interesting and furnish valuable controls for comparative studies in various pathological states later.

Tracer.—A radioactive isotope of sodium, Na^{24}, was prepared by the neutron irradiation of 'Analar' NaCl, which becomes, after neutron capture, partially converted into $Na^{24}Cl$. The dry crystals were first assayed to determine their activity; usually, on arrival, 1 g. contained 1–2 millicuries of Na^{24}, corresponding to about 5 atoms of radioactive isotope per 10^{10} atoms of stable Na. The crystals were made into sterile solution so that 1 ml. contained 10–20 microcuries. Immediately after delivery this concentration corresponded to about 1% NaCl; but, since the half-life of Na^{24} is only 14·8 hours, it was necessary, on successive days, to use higher concentrations of saline solution to achieve the same specific activity of Na^{24}. This solution, which

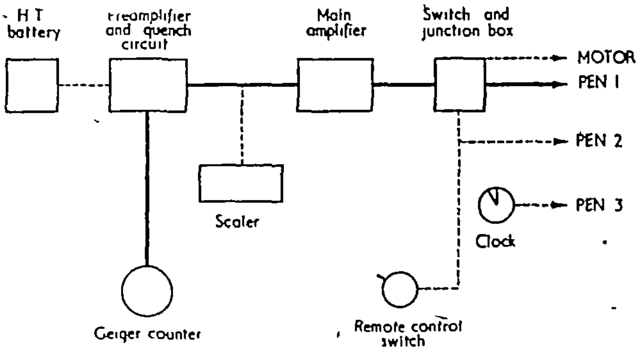

Fig. 1—Block diagram of apparatus.

never exceeded a concentration of 5%, was used for intravenous injection.

Apparatus.—The apparatus * consists essentially of a gamma-ray G-M counter, carried on an adjustable gantry. The counter is inserted into a tubular cylindrical lead block with a slot in the lower surface. All rays except those from vertically below are therefore subject to absorption by 4 cm. of lead, the thickness of the cylindrical wall. The counter is arranged so that the slot in the screen lies transversely over the femoral vein in the groin, and is pressed down as close to the body as possible without impeding the venous flow. Each pulse from the G-M counter is recorded on a motor-driven kymograph drum in such a way that any significant change in counting-rate becomes immediately evident. Fig. 1 is a block diagram of the apparatus, and fig. 2 shows a typical tracing obtained in a normal person and the method by which it has been interpreted.

INVESTIGATION

In the present study we examined 121 normal people aged 17–48 years, most of them falling within the 20–30 years age-group. The majority were students and probationer nurses leading active lives. No person with clinically observable varicose veins was included. The flow time was measured with the subject in the supine position, care being taken to ensure that the foot was at the same level as the heart, and that the head was not raised. The subjects were rested for at least 20 min. under a warm electric blanket so that their foot temperature approximated as nearly as possible to that of patients in bed—i.e., 33°C. To see whether skin temperature had any pronounced effect on the foot-groin time, 10 people were examined on two occasions, first in the way just described and again with the foot and leg immersed to the knee for 20 min. in a water-bath at 45–48°C.

A prominent vein on the dorsum of the foot was selected for injection, and a cuff, raised to 40 mm. Hg, was placed on the ankle above. A fine-gauge needle (no. 20) was inserted into the vein, without an injection being made. At this moment the drum was started and, after the " background " had been recorded for 15–20 sec., 1 ml. of $Na^{24}Cl$ solution was injected into the vein as rapidly as possible. The duration of the injection, about 3 sec., was recorded on the tracing. Flow times have been measured from the start of the injection period, since it is obvious that the solution first entering the vein will normally be the first to pass under the G-M counter. At the moment the radioactive material reached the groin the counter indicated an increase in counting-rate, and this was recorded immediately as a change of slope in the tracing. The moment of change was usually clear-cut, and, from a knowledge of the time of injection, the time of arrival at the groin, and the length of the leg (measured from the internal malleolu to the inguinal ligament over the femoral triangle the average rate of flow could be calculated. It wa found most convenient to express the result as foot groin time in seconds, after correction for length of le to a standard of 80 cm.

RESULTS

The foot-groin times for the 121 normal people a shown in fig. 3. The average flow time for the grou was 18 ± 0·9 sec. The mode of the group was at 13 se It can be seen that the observations form a skew cur with a range of 4–50 sec. When abscissæ are logarithm of the flow times, however, the data fit a normal dist bution curve ($\chi^2 = 11{\cdot}65$; P = 0·074). This type log-normal curve is often found in biological da (Gaddum 1945).

The data obtained have been further analysed f statistical differences between (1) males and femal and (2) right and left legs, as follows:

	No. of cases	*Average flow time (sec.)*	*Range (observati (sec)*
Males	50 ..	18·5 ..	4–47
Females	71 ..	17·6 ..	6–50
Right leg	54 ..	18·4 ..	4–50
Left leg	67 ..	17·4 ..	6–47

There is thus no significant difference between th groups, nor does any group differ significantly from t series as a whole.

Finally it was shown that the results obtained in t 10 people examined in the standard manner and ag after vasodilatation had been induced by immersion hot water showed no significant change when analys by Fisher's (1944) method. The times observed were follows:

Subject	A	B	C	D	E	F	G	H	I
Flow time (sec.):									
At standard temp. ..	11	13	13	8	8	11	13	15	11
After immersion ..	10	11	10	4	10	13	11	14	15

DISCUSSION

The present study offers a direct and objective meth of measuring the rate of blood-flow in a partic section of the vascular system. The method avoid subjective errors by either the patient or the observe but there remain certain other possible errors whi need consideration. Since these are discussed mo fully elsewhere (Osborn and Wright 1948), it need on be stated here that the combination of the errors intr duced both by the random fluctuations of the " back ground " and by the fitting of a line to the slope in the kymograph tracing may be about 1 sec. in flo

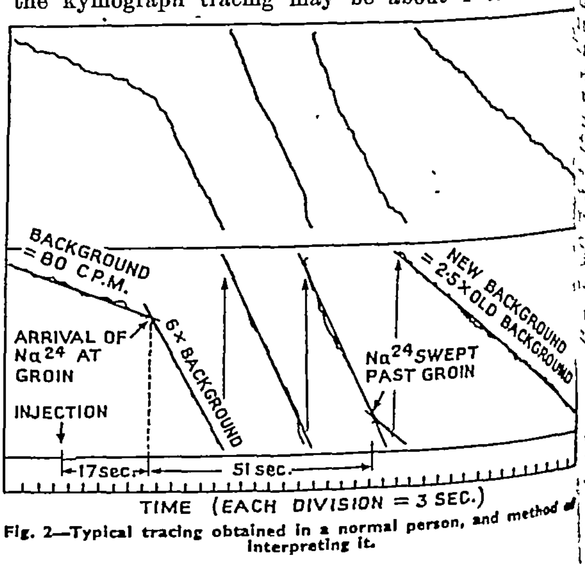

Fig. 2—Typical tracing obtained in a normal person, and method of interpreting it.

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* For a detailed account of the circuit and of the recording device used in this study, together with a discussion of the accuracy of recording and analysing the data obtained, see Osborn and Wright 1948.

times of 10 sec. or less and may increase up to 3 or 4 sec. in cases with long flow times of about 50 sec.

The end-point, when the slope of the tracing changes from that of the "background" to the new rate produced by the $Na^{24}Cl$ arriving under the G-M counter, is very clear when 10 microcuries or more is used, but with less amounts the concentration may be insufficient to produce so pronounced an alteration of slope. The injected solution is considerably diluted as it passes up the vein, especially in cases with a slow flow. This is shown by the fact that with a slow flow the change of slope is similar to that obtained when a more dilute solution of $Na^{24}Cl$ is injected in a person with a rapid flow, since the angle of the slope depends solely on the quantity of $Na^{24}Cl$ under the counter window. The time at which the slope changes, however, is independent of the concentration of $Na^{24}Cl$ used, provided it raises the count above the "background" sufficiently to be detected; the magnitude of the change of slope is the only variable depending on the concentration of the radioactive material at the counter.

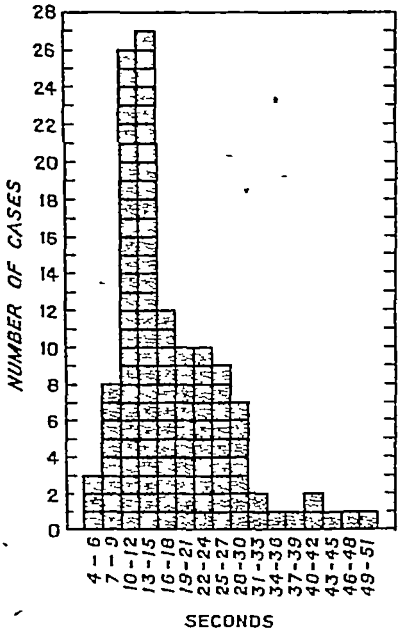

Fig. 3—Foot-groin times of blood-flow in 121 normal people.

A further feature of interest is the existence of the raised counting-rate at the groin after the arrival of the $Na^{24}Cl$. Fig. 2 illustrates this point. It can be seen that, compared with the duration of the [illegible] portion (about 3 sec.), a long time is required for the [illegible] containing $Na^{24}Cl$ to pass the counter. We believe that the reasons for this are (1) that the radioactive material is diluted by blood flowing into it from tributary veins as it passes up the leg; and (2) that the viscous drag causes the blood in the centre of the vein to travel very much more rapidly than that at the periphery. By the time all the $Na^{24}Cl$ has passed through the vein under the G-M counter the first part of the injected $Na^{24}Cl$ may well have become mixed with the circulation and be returning under the counter in the femoral artery. In this way the slope often trails off only slowly towards that of a new "background" level.

The observed range of flow times in the present series of normal people under standard conditions of rest and temperature has shown a wider variation than was expected by comparison with the recorded figures of other workers. Blumgart and Weiss (1927) used a radioactive substance (radon) in their observation of [illegible] arm times in normal and in diseased persons. They did not record any foot-arm measurements. Thompson et al. (1928), using vital brilliant red, found a range of foot-arm times from 30 to >75 sec., whereas Smith et al. (1940), using sodium cyanide, reported a range of [illegible] to >70 sec. in normal people for foot-carotid time. It is difficult to compare our average time of 18 sec. with those reported by these workers, since our measurement is of a direct foot-groin time, whereas other methods are foot-heart or lung-heart-artery times, and the time proportions of such a circuit can at present be estimated only approximately. Nevertheless it seems clear from the figures obtained by subtracting the arm-carotid from the foot-carotid times in the same person that our figure of 18 sec. is of the same order as those found by the indirect methods.

The much larger range of observed times in our series may be due to the sensitivity of the method. In such tests as that with sodium cyanide, where the end-point is determined by the observer noting a dilatation of the alæ nasi followed by a deep inspiration, it is likely that a proportion of cases will be noted as "no end-point," owing to a poor reaction to the drug; such cases would therefore be recorded as having exceeded the upper limit. In our entirely mechanical method of recording, however, even end-points with a minimal change of slope can be detected, and consequently a case showing no end-point is rare.

An increase of circulation-rate when the temperature of a limb had been raised was recorded by Kvale and Allen (1939) and by Smith et al. (1940). Significant changes were noted by these workers when the skin temperature rose from 20 to 33°C. We obtained no significant alteration of flow time, however, in the group examined at 33°C and again immediately after immersion in water at 45°C. The range of temperature change was about 10°C in both cases, but it is possible that our lower temperature, which was definitely "warm," had already evoked considerable vasodilatation and little further change took place when the temperature was raised to 45°C. Smith's lower figure of 20°C, however, might be considered as "cold," and a much greater vasodilatation would follow a rise over their temperature range. This suggestion is borne out by the observations of Roth et al. (1940) on the degree of vasodilatation produced in the extremities of limbs at different temperatures. We chose 33°C as a standard temperature because it approximates closely to the skin temperature of persons comfortably warm in bed, and our observations on normal people have been collected and analysed primarily to be a basis for the assessment of possible changes observed in pathological conditions in patients confined to bed. The extension of this work is in progress.

SUMMARY

A direct method of measuring the rate of venous blood-flow in the leg with the radioactive isotope Na^{24} is described.

In 121 normal people the mean foot-groin flow time under standard conditions was 18±0·9 sec. The extreme range of the observations was 4–50 sec.

The accuracy of the method is discussed and a comparison made with the findings by other methods of measuring rates of blood-flow.

We wish to thank Prof. W. C. W. Nixon, director of the Obstetric Unit, University College Hospital Medical School, for his interest and support; Mrs. M. Merrington, of the Galton research department, University College, London, for advice and help in the statistical analysis; and the students, nurses, and colleagues who volunteered as subjects for this investigation.

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FURTHER OBSERVATIONS ON THE RESULTS OF SYMPATHECTOMY OF THE UPPER LIMB

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Preganglionic section of the sympathetic nerve-supply to the arm (Smithwick 1940) is designed to leave a wide gap between the cut fibres. That sympathetic function can be regained, even to a small extent, seems at first sight difficult to believe; yet there is good evidence that this is so (Simmons and Sheehan 1939, Haxton 1947, Barcroft and Hamilton 1948). The question is of such fundamental importance to the surgery of the sympathetic nervous system that we describe below some further evidence in favour of it.

In our previous work (Barcroft and Hamilton 1948) vasomotor and sudomotor reflexes were completely absent in seventeen limbs tested 1–6 months after operation. Sixteen of these limbs have now been re-examined 1–$1^{1}/_{2}$ years later, and the results compared with those obtained earlier.

Vasomotor Test.—Warming the feet elicits a reflex increase in blood-flow in the hands, the efferent limb of the reflex arc being from the vasomotor centre through sympathetic fibres. In the absence of sympathetic connexions to the limb heating of the feet does not alter the blood-flow. The details of the test were described in our previous paper. The results are expressed as the ratio $\frac{\text{Blood-flow during heating.}}{\text{Blood-flow before heating.}}$ This heating ratio is 3 or more in normal hands; in completely sympathectomised hands it is 1.

Sudomotor Test.—The resistance to the passage of an electric current through the body is located almost entirely in the skin and is determined chiefly by the activity of the sweat glands. This activity depends on nervous excitation mediated through sympathetic fibres. In practice the test we used previously (Barcroft and Hamilton 1948) was simplified and was as follows. The feet were heated to encourage free sweating. The currents which flowed through the pads of the thumb and middle and little fingers were measured in µA, and the average of them was called the current difference. Normal hands have current differences of 20 µA or more, since the skin is moist. In fully sympathectomised hands current differences are negligible, since the brain cannot elicit sweating. (The absence of any humoral mechanism for excitation of sweating is proved by the fact that ulnar-nerve block reduces the current through the little finger to less than 1 µA.)

RESULTS

Vasospastic Attacks.—All the sixteen limbs had been operated on for frequent severe vasospastic attacks. The clinical condition at the time of the first and second tests was:

Time after operation	*No recurrence of attacks*	*Attacks less disabling*	*Attacks as bad as before*
1–6 months	14	2	0
1–2 years	12	4	0

Vasomotor Test

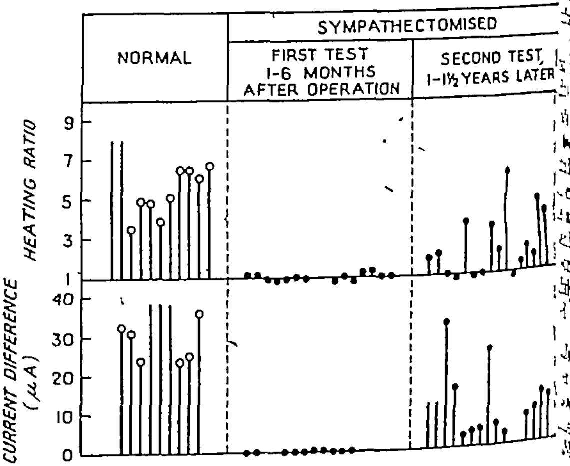
The heating ratios of some normal hands and those of the sympathectomised ones are shown in the upper half of the accompanying figure. Heating produced vasodilatation in all normal hands, the blood-flows being increased at least threefold.

The ratios of the sympathectomised limbs are arrange in two groups, 1–6 months after operation (the fir test), and 1–$1^{1}/_{2}$ years later, when the tests were repeated In each group the ratios are arranged in order of th length of time between the operation and the performanc of the first test, those tested soonest after sympathectom being on the left. As noted in the previous paper, a hands tested within six months of operation had heatin ratios of about 1—i.e., indirect heating had no effect o the vessels of the hands. In contrast to this, many the same hands, when tested a year or more later, h heating ratios considerably greater than 1—i.e., in the vasodilatation could once more be produced in the hand

Sudomotor Test

The current differences of the same normal and sy pathectomised hands are given vertically below th heating ratios in the lower half of the figure. All t normal hands showed large current differences due to t low resistance of the moist test skin and the relative larger resistance of the dry control skin. The resu from the sympathectomised limbs are arranged in t same groups, 1–6 months after operation and 1–$1^{1}/_{2}$ ye later. All the hands tested within 6 months of operati had very small current differences. When retest many of these same hands showed quite large curre differences.

The figure shows conclusively that there was evidence of any sympathetic nervous connexion betwe the brain and the hand for several months after sym thectomy. A year or more later, vasomotor and su motor reflexes were obtainable in many hands. T confirms the findings of Simmons and Sheehan (193 Haxton (1947), and Barcroft and Hamilton (1948).



Results of vasomotor and sudomotor tests obtained in sympathectomis hands.

It will be seen that clinical improvement persisted all hands, though reflexes had reappeared in mo Therefore the new nerve path formed is probably fun tionally poorer than that present before sympathectom

SUMMARY

Sixteen limbs, sympathectomised for frequent va spastic attacks, were each examined twice afte operation.

At the first examination, 1–6 months after operation attacks had not recurred in 14; they had recurred bu were less severe in 2; and vasomotor and sudomoto reflexes were absent in all the hands.

At the second examination, 1–$1^{1}/_{2}$ years later, attack had not recurred in 12; they had recurred but were le severe in 4. Vasomotor and sudomotor reflexes, thoug absent in some limbs, had returned in many.

The persistence of the excellent clinical results in these limbs, in spite of the reappearance of the reflexes in most, signifies that the new nerve path is functionally less efficient than that present before operation.

Once more, we acknowledge our gratitude to Prof. J. R. Learmonth, Mr. P. Fitzgerald, and Mr. J. S. Loughridge for putting us in touch with their patients; Mr. D. B. Smith for technical assistance; and the Medical Research Council for defraying expenses.

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A METHOD OF TESTING ANALGESICS

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EARLY in 1947 Messrs. Roche asked the Central Middlesex County Hospital to perform a clinical trial of their analgesic preparation 'Saridone.' * This paper describes an attempt to judge the effectiveness of these tablets by as impartial and accurate a method as possible. It is notoriously difficult to assess the power of different analgesics. There are three main methods—animal experiments, experiments on human volunteers with artificially produced pain, and clinical trial on patients with naturally occurring pain.

Animal experiments are useful in initial tests to select a substance for further trial, but they assess properties only remotely connected with the purpose of an analgesic. A patient wants a tablet that makes his pain better and not only one that stops a rat from twitching its tail away from a painfully hot lamp (a common laboratory test for analgesic properties is to measure the time taken before a rat moves its tail from an increasingly hot beam of light).

Experiments on artificially produced pain have disadvantages too. First, the subjects have not the same mental attitude to the pain as ordinary patients have. It is a pain of their own choosing, and so they suffer none of the anxiety, resentment, and irritability that usually attend naturally occurring pain. Their discomfort is somewhat modified too by the pleasure of feeling slightly heroic and by the curiosity of being experimented on.

Clinical Trials

The danger of clinical trials is that a perfectly controlled test is so hard to arrange. Also, the more elaborate the arrangements, the less closely do the conditions of taking the tablet resemble normal bedside administration. For any fair trial a control inert tablet should be given, but if the identity of the tablet is known to the doctor supervising the tests or to the nurses giving the tablets, their own attitude may much influence the attitude of the patients and so corrupt the results. Consciously or unconsciously a nurse giving a substance she knows to be inert may convey her distrust of the tablet to the patient by manner, gesture, or word. The way people can be unconsciously influenced by a word is well shown by the results of an American bureau of salesmanship who found that when a salesman said "Ice-cream, sir? Large?" he sold over 50% more large ice-creams than when he said "Ice-cream, sir? Large or small?" It is therefore essential that the identity of substances under trial be not known by anybody until all the tests are completed. As well as a control tablet and the substance being investigated, it is useful to include a substance of established reputation so that we can answer two questions: (1) does the substance work? and (2) does it work any better than what we are using at present?

In the present trial three kinds of tablets were used: saridone, an inert tablet, and tab. codeine co. (N.W.F.), which is perhaps better known as 'Veganin.' Messrs. Roche kindly made up these three substances in tablets of identical appearance, except that they were coloured red, white, and blue (not necessarily respectively). For the second half of the experiment they supplied another set of tablets in which these colours were changed round. There was no possible way of knowing which colour corresponded to which tablets. The key to the identity of the tablets was provided in a sealed envelope which was kept locked in a drawer until after the whole trial was completed, when it was publicly opened by the chairman (Dr. Avery Jones) at a meeting of the clinical society of the Central-Middlesex County Hospital. Messrs. Roche also printed for me a corresponding number of cards bearing on one side instructions to the nurse and on the other side instructions to the patient. The instructions to the nurse were as follows:

> These tablets are to be given for the relief of pain, not for sleeplessness without pain. Two tablets of the same colour are to be given. Only one pair of tablets may be tried by each patient. Please hand this form to any patient who is given these tablets.
>
> Please complete this side of the form first and see that the patient fills in the other side properly.
>
> Name of Patient ____________________
>
> Ward ____________________
>
> Description of Pain and/or Diagnosis ____________________
>
> Colour of Tablets Supplied ____________________
> (Different coloured tablets may not be given together.)

The instructions to the patient were as follows:

> You are asked to try these tablets which are for easing pain. Please help us to judge them by filling in this form. Do not fill it up for at least two hours after taking the tablets.
>
> 1. Was the pain (*a*) Slightly eased? __________
> (*b*) Completely relieved? __________
> (*c*) Not changed at all? __________
>
> Put a cross against one of these answers.
>
> 2. How soon after taking the tablets did you get any benefit?
> ____________________
>
> 3. Did you notice any other effects from the tablet? If so write them here. ____________________

EXPERIMENT I

Two hundred pairs of tablets from the first set were distributed to the wards with the same number of cards, and an explanation of the experiment was given to the nurses. They were asked to give the tablets to patients to whom they would normally have given aspirin or codeine tablets, but not to patients with severe pain needing morphine. They were not told that any of the tablets were inert, but most of them guessed that at least one colour of the three kinds would be inactive. They were only told one deliberate lie—that different wards were being given different sets of tablets. I did not want rumours, such as "blue are the duds," to spread from ward to ward; so I left them believing that what was blue in one ward might be white in another. Further I feared that tablets might be lent by one ward to another, which would muddle results if different sets were used (and this actually happened). It was interesting to hear the different reputations of the various colours. In one ward the sister told me "I am sure the white have nothing in them; so I only give them to patients I don't think have really got a pain." In an adjacent ward the sister swore by the blue and restricted their use to the

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* Saridone, according to the makers, is an effective and balanced combination of analgesics, rapid in action and free from disagreeable effects. It is recommended for headache, toothache, rheumatism, &c. The formula is:

Isopropyl antipyrine	..	..	150 mg.
Phenacetin	..	..	250 mg.
'Persedon'	..	..	50 mg.
Caffeine	..	..	50 mg.
Weight of tablet	..	..	600 mg.

patients with the worst pain. It became more and more obvious what a good thing it was that nobody really knew which tablet was which, and that the different wards thought they had different tablets. Until both lots of tablets were all used I did not add up the results from the cards, and so I had no idea which were the inactive tablets.

Of the 200 cards issued 141 were suitable for analysis. The others had been lost or were inadequately or ambiguously complete. The results of these tablets are shown in table I. The column marked "strict" gives a strict criterion of relief, and the column marked "wide" gives a wide one—i.e., in the "strict" column relief means that "completely relieved" was recorded, and no relief that "not changed at all" or "slightly eased" were recorded; in the "wide" column relief includes both "completely relieved" and "slightly eased," and no relief means "not changed at all."

From the total results at the bottom of the table it is easy to see, without statistics, that the pink tablets are far less effective than the other two—i.e., over half the patients got no relief from them, whereas from the other tablets more than nine-tenths got relief (in its widest sense). Taking relief in the strict sense the conclusion is the same though not quite so obvious (the pink tablets gave 31% complete relief compared with 55% and 65% for the other two). I was thus almost certain, after adding up these results, that the pink were the neutral tablets. The other deduction is that the blue and the white tablets do not significantly differ in power, for they give 92% and 94% relief (wide criterion) and 55% and 65% relief (strict criterion) respectively. Statistical analysis of the figures confirms these self-evident results.

TABLE I—RESULTS OF TRIALS OF ANALGESIC TABLETS (EXPERIMENT I)

Ward	Effect	White tablet		Pink tablet		Blue tablet	
		Criterion of relief		Criterion of relief		Criterion of relief	
		Strict	Wide	Strict	Wide	Strict	Wide
Annexe	Relief ..	..	..	1	1	1	2
	No relief..	..	..	0	0	1	0
C3	Relief ..	5	0	0	3	4	4
	No relief..	1	0	5	2	1	1
D2	Relief ..	1	2	0	1	1	2
	No relief..	1	0	1	0	1	0
C4	Relief ..	3	5	2	2	4	5
	No relief..	2	0	0	0	1	0
D3	Relief ..	3	3	0	0	1	3
	No relief..	0	0	5	5	4	2
B4	Relief ..	4	5	2	2	0	4
	No relief..	2	1	2	2	4	0
A2	Relief ..	2	2	0	0	1	3
	No relief..	1	1	3	3	2	0
A1	Relief ..	4	5	3	3	3	4
	No relief..	1	0	1	1	2	1
O2	Relief ..	2	5	0	1	3	5
	No relief..	3	0	4	3	2	0
O1	Relief ..	2	4	4	4	3	5
	No relief..	2	0	1	1	2	0
D1	Relief ..	1	4	0	1	2	4
	No relief..	4	1	4	3	2	0
C1	Relief ..	5	5	1	3	4	4
	No relief..	0	0	4	2	0	0
Total	Relief ..	32 (65%)	46 (94%)	13 (31%)	21 (49%)	27 (55%)	45 (91·8%)
	No relief..	17 (35%)	3 (6%)	30 (69%)	22 (51%)	22 (45%)	4 (8·2%)
	Total ..	49		43		49	

TABLE II—RESULTS OF TRIALS OF ANALGESIC TABLETS (EXPERIMENT II)

Effect	Pink tablet		White tablet		Blue tablet	
	Criterion of relief		Criterion of relief		Criterion of relief	
	Strict	Wide	Strict	Wide	Strict	Wid
Relief	22 (42%)	43 (83%)	11 (28%)	28 (70%)	20 (40%)	40 (80%
No relief ..	30 (58%)	9 (17%)	29 (72%)	12 (30%)	30 (60%)	10 (20%
Total ..	52		40		50	

When the key to the identity of the tablets was open it revealed that the pink tablets were inert, the wh tablets were codeine co., and the blue tablets sarido This experiment therefore suggests the following:

(1) Tab. codeine co. and saridone are very effecti in relieving various kinds of moderate pain.

(2) There is no significant difference in their effecti ness, but tab. codeine co. was slightly more success in this experiment (and it is also about a quarter t price of saridone).

(3) An inert tablet can give some relief in 50% cases.

(4) Small experiments are useless in judging analge effects—note the widely differing results in differ wards.

It cannot be assumed that the 50% effectiveness a dummy tablet is due to suggestion; a proportion doubtless due to spontaneous remissions of pain. would be impossible to measure this proportion with a further series of patients who were given nothing their pain—not even a dummy—and such people mi be too disgruntled to complete their cards properly.

EXPERIMENT II

When the first experiment had been completed (not computed), the second lot of tablets were used confirm the previous findings. In this second experim because it was troublesome dealing with many differen wards, only the two maternity wards were used. Con quently this series contained a high proportion of "aft pains" and "headaches" and is not strictly comparat with the assortment of pains tested in the first expe ment. Nevertheless the conclusions were much the same see table II, which records another 142 trials.

The white tablets were obviously less effective th the pink and blue tablets, giving only 28% comple relief compared with 42% and 40% with the other White was correctly deduced as being the dummy. T pink tablets were saridone, and the blue tablets codei co. Therefore, as before, saridone and veganin were abo equal in effect, giving complete relief in 42% and 40 and some relief (wide criterion) in 82·8% and 80% cases, respectively. All these figures are lower than tho of the first experiment and suggest that after pains d not respond so well to analgesics as do other varieties pain. Nevertheless, these women got much more reli from inert tablets than did the patients in the othe series—70% compared with 49%. This may mean tha women are gullible and more easily duped, but I thin more probably it shows that after pains and headach very often clear spontaneously.

OTHER FINDINGS

No significant effect from colour was noted—i.e., the relative efficacy of the tablets was the same in both experiments—but there is possible evidence that a dud white tablet is better than a dud pink one (some patent medicine merchants may be interested to know this).

No significant side-effects were noted with any of the tablets, and no information was obtained about the speed of action of the different tablets, partly because so few patients filled in the sections asking about these matters.

COMMENT

This investigation was fairly easy to carry out, and I suggest that the tricolour method or a modification of it should be used as a standard method of testing various drugs. Uncontrolled tests give results so variable as to be valueless. Such controversies as that about the effect of vitamin E in angina or in the myopathies might well be settled in this way. Any substance deserving to be used by clinicians ought to be discernible from a dummy without its identity being known, and to show some advantage over other active substances serving the same purpose.

My thanks are due to Messrs. Roche, who supplied the tablets and cards; the medical staff who allowed me to try the tablets on their patients; and Dr. George Discombe and Dr. Richard Doll for help in the presentation of the results.

Medical Societies

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

Early Stages of Cervical Cancer

At a meeting of this society in Manchester on Oct. 8, with Mr. J. E. STACEY, the president, in the chair, an address on Early and Precursory Stages of Cervical Cancer was given by Prof. EMIL NOVAK (U.S.A.).

Last year, said Professor Novak, 18,000 women in the U.S.A. died from cancer of the uterus. It would appear that as regards the development of malignant disease there are three classes of people: (1) those whose inherent predisposition is so strong that they are predestined to suffer cancer irrespective of any other circumstances; (2) those in whom the predisposition is less prominent and in whom an exciting factor is required for development of the growth (the factors possibly exciting uterus being injury, infection, and œstrogenic hormones); and (3) those who have no predisposition and will never develop cancer even when exposed to the activating factors which determine the onset of the disease in class 2.

The relationship of œstrogens and carcinoma is difficult to define. Judging by the well-known effects of these hormones, they might reasonably be supposed to cause cancer in susceptible women; but this action would operate only in respect of the breast, uterus, vagina, and vulva. Experimentally cancer of the breast has been produced with œstrogens only in mice. Cervical changes in animals after the administration of œstrogens can be prevented by giving progesterone, which seems to have some protective effect against the carcinogenic action of œstrogen. Though agreeing that there might be hesitation in employing œstrogen therapy in the presence of a precancerous lesion, or in a woman with a strong family taint of malignant disease, Professor Novak said that he did not know of a single case in which œstrogens had been shown to have caused cancer in women.

Turning to pathological features, he observed that leucoplakia of the cervix is now generally held not to predispose to malignant change. The most important lesion is intra-epidermal carcinoma, alternatively known as Bowen's disease or carcinoma in situ. In this the cells of the epidermis take on malignant features, but the disorder may remain localised for many years, ultimately breaking through the basement membrane to assume typical malignant characters. When this condition is found in one part of the cervix, fully established carcinoma is commonly found in another part when a thorough search is made. Nevertheless, with routine and careful examination of cervices it should be possible to find and treat this lesion while it is localised. Amputation of the cervix is probably sufficient, though in Professor Novak's clinic total hysterectomy is usually carried out—partly for the purpose of having all the material for study and research. Another change in the cervix which may be significant is unusual activity of the basal cells of the epidermis. This may be a reaction to a hormonal stimulus. Such a change, and even pseudomalignant features, are to be seen in the cervix sometimes during pregnancy; they are reversible and may well be associated with the profound hormonal changes of pregnancy.

In the early diagnosis of malignant and premalignant states the Schiller test with iodine has little application, since it indicates merely the site of pathological change and not its nature. Vaginal-smear studies are in vogue but are extremely difficult to interpret; even the few experts with adequate experience admit a comparatively high percentage of errors in diagnosis. Cervical biopsy still remains one of the most reliable methods, particularly when the modification known as "surface biopsy" is adopted. By this method large areas of the superficial layers of the epithelium are removed by scraping with a curette or sharp spoon. This is a most satisfactory way of revealing intra-epidermal carcinoma.

New Inventions

A MONOCHROMATIC HALOMETER

THE halometric determination of red-cell diameters is capable of considerable precision provided the diffraction halo is reduced to its simplest form and a sound method of measurement is adopted. The halo appears as a central bright disc surrounded by a bright ring—the fainter outlying rings can be ignored. The problem is to measure the angular diameter of the bright ring. The ring fades off indefinitely inwards and outwards, and when, as is usual, an ordinary lamp is used, it ranges through the spectrum from blue on its inner side to red on its outer side. It is impossible to define at all simply what one means by the diameter of such a ring. If however, a monochromatic light is used the ring will appear of a uniform colour fading off inwards and outwards from a brightest central zone. One is thereby provided with a perfectly definite diameter—that of the brightest zone.

The most popular method of measurement is to use two lights and thus produce two halos. By adjusting the distance between the lights one attempts to bring the two rings into contact, when the angular distance between the lights will equal the angular diameter of either ring. If the rings were thin circles of light this method would be ideal, but that is not so with diffuse rings. Even with monochromatic halos it is extremely difficult to estimate when the brightest zones coincide, owing to overlapping of the edges; but with coloured halos the overlapping colours reduce the procedure to mere guesswork.

Early last century Thomas Young measured halos by a most effective method which seems to have been forgotten. He introduced between the blood film and the light a screen containing a central aperture surrounded by a ring of pinholes, so that the pinholes appeared superimposed upon the halo. By adjusting the distance of the screen, he placed the pinholes on the brightest part of the coloured ring. The distance between the eye and the screen was then proportional to the diameter of the red cells. If a monochromatic light is substituted for the white light, one can place the pinholes on the brightest zone of the monochromatic ring with much greater precision.

An instrument incorporating a monochromatic light and Young's perforated screen has been in use in my laboratory for twelve years, and its theoretical advantages have been fully borne out in practice. The design has recently been modified and the completed instrument has been built for me by Kaylene Ltd., of Cricklewood. A mercury lamp with choke is enclosed in the apparatus and can be plugged direct into the alternating-current mains. Part of the beam passes through a filter to produce a green or yellow monochromatic halo; another part remains unfiltered and illuminates the pinholes which thus appear as whitish points standing out sharply against the green or yellow halo. To obtain the highest accuracy the brightness of the halo is controlled by an iris diaphragm and that of the pinholes by a movable "occulting disc." An aluminised mirror turns the rays through 90° so that the film to be measured is in a *horizontal* position. In this way one can also measure cells in the wet state. The cells suspended in a salt solution or in their own serum are run into a chamber provided for the purpose and allowed to settle down on its floor. Both cm. and µ scales are provided, the latter ranging from 5·0 to 10·0 µ.

When anisocytosis is slight the halometric diameter corresponds to that given by the peak of the Price-Jones curve. With increasing anisocytosis the halometric diameters tend to be somewhat larger, but the halometric diameter is always a perfectly definite quantity which the measures of different observers can very closely reproduce.

It is found that cell suspensions give even more consistent results than dried films, in which unequal shrinking is so liable to occur. Already interesting results are being obtained on the manner in which cell diameters vary with changes in their suspending media.

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Dupuytren's Contraction

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SOME 355 authors have contributed to this subject, the first as early as 1614. None, however, has dealt with it as thoroughly as the writer of this monograph. He gives a minute description of the anatomy and embryology of the palmar aponeurosis, a detailed survey of the incidence and symptoms of the disease, and an original discourse on its pathology and pathogenesis, supporting his arguments with some convincing photomicrographs and electron-microscope observations. He relates the condition to some similar changes in connective tissue, and to epilepsy, and finally surveys the history of treatment and gives a complete description of treatment by modern surgery. His monograph will be valuable to surgeons and teachers.

Proteins and Amino Acids in Nutrition

MELVILLE SAHYUN, M.A., PH.D., biochemist consultant, Charles Godwin Jennings Hospital, Detroit, Michigan. New York: Reinhold Publishing Co. London: Chapman & Hall. 1948. Pp. 566. 45*s*.

EACH of the fifteen chapters in this book is by a separate author or authors, and each deals with some aspect of protein metabolism. The last two are on the protein nature of toxins, antitoxins, and related substances, and the protein nature of filtrable viruses. The last-named, by Max Lauffer, is one of the best in the book.

The opening article, on the historical aspects of proteins in nutrition, shows how the work of the pioneers such as Magendie, Mulder, Boussingault, Claude Bernard, Voit, and Rubner led up to the contributions of the great men of more modern times like Atwater, Kossel, Hopkins, Osborne, and Mendel. H. H. Mitchell has contributed a sound chapter on the biological utilisation of proteins and protein requirements, and Deuel one on caloric, vitamin, and mineral requirements, with particular reference to protein nutrition. A study of the economic aspects of food proteins by Lela Booher is thoughtful and clearly presented. The chapter on the amino-acid requirements of birds, by Almquist, will interest those whose interests have been confined to mammals. Abraham White deals with the relation of hormones to protein metabolism, and the remaining chapters are on plasma proteins, protein deficiency, and protein and amino-acid requirements —in children, in surgical patients, in cases of burns, and in relation to fluid balances and mineral salts. The best chapters are written by those who have themselves made outstanding contributions to their subjects.

The book is an all-American production and suffers in places from isolationism. It is misleading, for instance, in a review of nutritional œdema, to neglect entirely the fundamental work done in Germany between 1915 and 1925. It never has been, and never can be, superseded. A little repetition here and there might have been avoided by stricter editing. It is questionable if the inclusion o the Chatfield and Adams tables of food composition o those of the Bureau of Human Nutrition, occupying 90 pages of text, was justified. The book has a distinctl clinical flavour, and in no way competes with the recen series of volumes on "Advances in Protein Chemistry." A second edition in a few years' time would be welcome

Nouvelle pratique chirurgicale illustrée

(Fascicule 1.) JEAN QUÉNU. Paris: Doin. 1948. Pp. 27 Fr. 550.

THIS atlas of surgical operations, accompanied by few notes on methods and indications, is really a co tinuation of those excellent books originally written b Pauchet. The illustrations, by the same artist, are clea and explanatory. This first volume ranges over number of departments of surgery. Dr. Quénu, th chief editor, presents abdominoperineal excision of th rectum and hysteropexy, giving indications for the latter He considers fixation of the isthmus of the uterus to b preferable to round-ligament fixation or suture of th fundus; but of course, in order to do this operatio the surgeon must be able to bring the isthmus up to th *abdominal wall above the pubes. The other operatio* selected, described by his associates, are radiotherapy the uterus, the cure of vesicovaginal fistula, the trea ment of non-union of a fracture of humerus and of th neck of femur, and arthroplasty for osteo-arthritis of th hip—the method of dealing with the hip being origin All these operations are of interest to English readers.

Occupational Marks and other Physical Signs

FRANCESCO RONCHESE, M.D., instructor in dermatolog Boston University. New York: Grune & Stratto 1948. Pp. 181. $5.50.

Dr. Ronchese has brought together, by means of so 250 photographs and diagrams, examples of chara teristic body marks, common and uncommon. Here a the callosities of barbers, tailors, carpenters, jeweller plasterers, cooks, and surgeons, the boxer's cauliflow ear, the golfer's finger-joint, and the violinist's nec mark. The book's subtitle is "A Guide to Person Identification." The author warns us that his pages w not turn every practitioner into a Sherlock Holmes, b he offers us these records of diversified medical practic having found them useful as an aid to the scienti identification of unknown bodies and hoping that the may stimulate others to make further contributions.

Modern methods such as the use of protective glove may nullify the value of some of these occupation stigmata; some marks are becoming obsolete. Th ischial bursitis known as "weaver's bottom," now ran may have been common in the days of hand-weaving (Dr. Ronchese remarks, by the way, that Shakespeare choice of the name Bottom for his rustic weaver ma have had this association.) There is a short chapter o deceptive markings and legal problems; the questio whether a callus entitles the patient to compensation touched upon. A brief foreword by Prof. John G. Downin emphasises the value of developing the faculty of correc observation and correct interpretation. The law report he remarks, contain cases of mistaken identity resultin in injustice. "It is possible to change the colour of th hair, remove teeth and alter the appearance in othe ways, but the stigmata of occupation last for a lon time." Such physical marks are useful evidence fo identification. "Good physicians must be good detective also to solve the riddle of disease."

A Synopsis of Regional Anatomy (6th ed. London: J. & A. Churchill. 1948. Pp. 436. 18*s*.)—Prof. T. B. Johnston's synopsis has reached its venerable position because it is useful and accurate. The new edition finds space for a summary of the extrapyramidal system, and other new matter has been added. The student can perhaps be trusted to find out the pleasures of the book. Professor Johnston, following the principle laid down in the old advertisement for 'Monkey Brand,' contents himself with a warning: "the book should not be consulted at all," he says, "until the actual work of dissection is completed and revision is being undertaken." That is indeed a moment when most students are glad of a little topographical guidance.

THE LANCET

LONDON: SATURDAY, NOV. 13, 1948

A World Influenza Centre

Two related happenings have emphasised the need etter international collaboration in the field fluenza. First, promising reports of successful cination against this disease in 1943 and 1946 e been followed by the disappointing news of st total failure in 1947. Eight unfavourable rts have lately been published in America[1] and e in Britain.[2] All observers agree that this sad lt is probably due to the emergence of an antigenic e of influenza virus A not closely related to those d for making the vaccine. Apparently, serological es of A can differ from each other widely enough tiate attempts at vaccine prophylaxis. Second the evidence suggesting that influenza viruses may capable of spreading rather quickly across the ld. Influenza B apparently did so in 1945–46 a type of virus A which caused trouble in America 1947 is apparently identical with strains recovered Britain, Holland, and Sweden at the same time and bly with one isolated in Australia in 1946. There was an obvious need for study of the "global miology" of influenza.

an outcome of informal discussions on this held at the International Microbiological rence in Copenhagen in 1947, the World Health isation is supporting a World Influenza Centre. Medical Research Council has agreed that this l be set up at the National Institute of Medical arch at Hampstead under Dr. C. H. ANDREWES, S. As a beginning, the centre hopes to obtain pt news of the prevalence of influenza anywhere in world and to collect strains for study. Such strains l be examined and compared at Hampstead or t to interested laboratories elsewhere. The success the scheme depends on establishing contact with ers in other countries. The hope is that a number countries will designate laboratories as regional tres, which will be able to decide by serological s whether local outbreaks are due to viruses A or B, d to isolate and dry new strains and send them to centre. Countries not equipped to establish regional tres will be asked to appoint observers who will ep the centre informed of the local activity of enza and if possible send specimens by air to e nearest regional laboratory. In the United States n organisation along similar lines has been begun. bout 35 laboratories have been invited to act as watch stations" or "listening posts," and these ll send new strains to a national influenza strain study centre in New York. Close coöperation will be maintained between this centre and the one in London.

The present set-up is designed primarily to acquire information; as yet it has neither the knowledge nor the authority to try to stop the spread of epidemics. It will try to find whether we are right in guessing that these strange serological races of flu are globe-trotters. It aims to learn whether there are limited numbers of serological types of influenza or whether the virus has limitless powers of variation. Maybe the information gained will be such that we can later hope to foresee the advent of a new strain from abroad and have time to prepare a homologous vaccine to greet it; such hopes are decidedly premature at present. Let us hope that the centre will justify itself and prove how great are the possibilities of fruitful international collaboration under W.H.O.

Hospital Manners

SOME hospitals have a name for making patients welcome, and take a pride in keeping it. What starts such a tradition? Doctors with a friendly manner? An enlightened matron? Well-chosen sisters? Contented nurses? Whichever it is—and all must play a part—such a tradition is of great moment to the sick. Moreover, it is not easily broken, for every newcomer to the staff breathes it in and learns to pass it on. But unfortunately bad traditions are as easily inherited and as hard to break as good ones. Our correspondent on p. 78[illegible], who has tried both, gives an instructive account of life in a hospital where the tradition was a poor one. There is nothing unfamiliar about the picture she draws: she got the sort of treatment we are all apt to get nowadays in shops, restaurants, and hotels—grudging unwilling service. The cause of this attitude can hardly be debated here; some blame CROMWELL, others wars, fatigue, national poverty, or even the licensing laws; but it marks a decline from our status as Merry England and from former standards of kindness. This decline has to be checked. Happily there are a few hotels left where the staff seem actively pleased to see the traveller; there are still some hospitals where the patient's comfort does not take second place to administrative convenience—or at any rate not all the time; and from these islets of good practice regeneration might begin. The danger is that a spread of bad practice will outstrip the healing process.

One strikingly bad practice noted by our correspondent is that of leaving the patient in the dark about his condition. "They don't tell you anything" is a serious allegation against any hospital, and especially against the doctors, since it ascribes to them an almost 19th-century concern with the purely physical facts of the case coupled with a 20th-century disregard of the rights of the individual. Consultants who cannot, or will not, spare time to explain the patient's illness to him in a few private words, or who do not insist that their housemen explain it, are out of date in their medicine. Even the family doctor too oftens protects himself by oracular silence, leaving the patient to make his own painful or alarming guesses. It is increasingly clear that recovery trolled by an iris diaphragm and that of the pinholes by a movable "occulting disc." An aluminised mirror turns the rays through 90° so that the film to be measured is in a *horizontal* position. In this way one can also measure cells in the wet state. The cells suspended in a salt solution or in their own serum are run into a chamber provided for the purpose and allowed to settle down on its floor. Both cm. and μ scales are provided, the latter ranging from 5·0 to 10·0 μ.

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[1] Loosli, C. G., Schoenberger, J., Barnett, G. J. Lab. clin. Med. 1948, 33, 789.

[2] anby, H., Dudgeon, J. A., Andrewes, C. H., Mackay, D. G. Lancet, 1948, i, 789.

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Nouvelle pratique chirurgicale illustrée

(Fascicule 1.) JEAN QUÉNU. Paris: Doin. 1948. Pp. 27 Fr. 550.

THIS atlas of surgical operations, accompanied by few notes on methods and indications, is really a con tinuation of those excellent books originally written b Pauchet. The illustrations, by the same artist, are cle and explanatory. This first volume ranges over number of departments of surgery. Dr. Quénu, th chief editor, presents abdominoperineal excision of th rectum and hysteropexy, giving indications for the latte He considers fixation of the isthmus of the uterus to b preferable to round-ligament fixation or suture of th fundus; but of course, in order to do this operatio the surgeon must be able to bring the isthmus up to th *abdominal wall above the pubes. The other operatio* selected, described by his associates, are radiotherapy the uterus, the cure of vesicovaginal fistula, the trea ment of non-union of a fracture of humerus and of th neck of femur, and arthroplasty for osteo-arthritis of th hip—the method of dealing with the hip being origin All these operations are of interest to English readers.

Occupational Marks and other Physical Signs

FRANCESCO RONCHESE, M.D., instructor in dermatolog Boston University. New York: Grune & Stratt 1948. Pp. 181. $5.50.

Dr. Ronchese has brought together, by means of so 250 photographs and diagrams, examples of chara teristic body marks, common and uncommon. Here a the callosities of barbers, tailors, carpenters, jewelle plasterers, cooks, and surgeons, the boxer's cauliflow ear, the golfer's finger-joint, and the violinist's nec mark. The book's subtitle is "A Guide to Person Identification." The author warns us that his pages w not turn every practitioner into a Sherlock Holmes, b he offers us these records of diversified medical practi having found them useful as an aid to the scienti identification of unknown bodies and hoping that th may stimulate others to make further contributions.

Modern methods such as the use of protective glove may nullify the value of some of these occupation stigmata; some marks are becoming obsolete. Th ischial bursitis known as "weaver's bottom," now ra *may have been common in the days* of hand-weavin (Dr. Ronchese remarks, by the way, that Shakespeare choice of the name Bottom for his rustic weaver ma have had this association.) There is a short chapter o deceptive markings and legal problems; the questio whether a callus entitles the patient to compensation touched upon. A brief foreword by Prof. John G. Downin emphasises the value of developing the faculty of corre observation and correct interpretation. The law report he remarks, contain cases of mistaken identity resultin in injustice. "It is possible to change the colour of th hair, remove teeth and alter the appearance in othe ways, but the stigmata of occupation last for a lon time." Such physical marks are useful evidence fo identification. "Good physicians must be good detective also to solve the riddle of disease."

A Synopsis of Regional Anatomy (6th ed. London J. & A. Churchill. 1948. Pp. 456. 18*s.*).—Prof. T. B. Johnston's synopsis has reached its venerable position becaus it is useful and accurate. The new edition finds space fo a summary of the extrapyramidal system, and other ne matter has been added. The student can perhaps be trusted to find out the pleasures of the book. Professor Johnston, following the principle laid down in the old advertisement fo 'Monkey Brand,' contents himself with a warning: "the book should not be consulted at all," he says, "until th actual work of dissection is completed and revision is bein undertaken." That is indeed a moment when most student are glad of a little topographical guidance.

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If we are to translate this valuable investigation to everyday practice there is still some guessing to be done. No local treatment saved all experimental animals from death ; no local antiseptic was far better than the others. There is also much work to be done on the pharmaceutical side, and the technique used at Leeds might be profitably employed in seeking the most generally useful method of compounding flavine and the sulphanilamide compounds. Moreover, the work lately recorded in our columns[2] shows once more that diamidine derivatives should have a full trial. Since human wounds are not standard, and the infecting organisms are a fairly inclusive selection from the catalogue of schizomycetes, we must not hope that experiments such as these will immediately bring to light the ideal local antiseptic. However, there is little doubt that small boys show sound judgment in preferring proflavine to tincture of iodine on their bare and bloody knees.

Annotations

A FAMILY MATTER

PROBLEM families, unlike problem plays, seldom confine themselves to one problem at a time. They bristle with problems, and hook them like burs into any passing coat. A few years ago Dr. C. P. Blacker made a list[3] of the problems they present, and the people who may be called upon to solve them. Thus the children of a problem family may be delinquent, or may have been removed from their unsatisfactory parents ; or they may be lousy, scabietic, dirty, neglected, or ill treated ; or the family may have high miscarriage, stillbirth, and infant-mortality rates ; or it may be chronically dependent on public funds ; or some of the members may show the features mentioned in the Wood report—mental defect, backwardness, mental disorder, epilepsy, drunkenness, prostitution, unemployability, and crime or recidivism. Those who encounter problem families in one or other of these manifestations are medical officers of health, school teachers and medical officers, school nurses and attendance officers, N.S.P.C.C. inspectors and heads of other voluntary bodies including the Family Welfare Association, health visitors, sanitary inspectors, district nurses and midwives, public-assistance officers, probation and relieving officers, chief constables, borough treasurers, directors and social workers of child-guidance clinics and of psychiatric clinics for adults, superintendents and social workers of mental hospitals, and officials of labour exchanges. What is needed is some means of pooling their information and dealing with the family as a unit ; and Dr. Blacker suggested that the proper thing to do was to make some one person in each area responsible for receiving reports on problem families, ministering to their needs, and endeavouring to reclaim them.

As a step towards this end the Problem Families Committee, of which he is chairman, has lately undertaken six pilot inquiries,[4] with the primary intention of establishing a serviceable method of investigation. First, people, bodies, and departments likely to come into touch with problem families are to be invited to submit names and brief particulars of any such families known to them. The number of times a single family is mentioned by different bodies will give some indication of the size of the problem it presents. A consolidated list of families will be prepared under the direction of the M.O.H., in which the families will be set out in terms of the number

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Gordon, J., McLeod, J. W., Mayr-Harting, A., Orr, J. W., Zinnemann, K. *J. Hyg., Camb.* 1947, 45, 207.

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Meanwhile a patient is far from being a passive observer of human nature in action. Accustomed to think of himself as an adult citizen of a free country, he holds that he should be told not only what his symptoms mean, but what the doctor hopes the treatment will achieve, and why. He dislikes being launched on some new course of treatment without any understanding of its form and purpose. The example given by our correspondent of two women who worried for twenty-four hours about a new kind of treatment, only to find it was merely a different sort of medicine, is a case in point. Fearing to give trouble, they mentioned their anxiety only to other patients. It never entered the heads of the houseman and sisters that they might be afraid. The houseman, presumably, had never been taught to think like that; yet the ability to ask the right question at the right moment can be taught as directly as percussion and auscultation. These two patients had a clear-cut fear which would have been readily disclosed in friendly conversation; others may have more obscure fears at which the doctor can only guess. But sometimes even gross signs of fear are ignored as long as possible: "the patient's physical reactions were studied," our correspondent remarks; "his mental reactions received no attention till they caused trouble." Trouble, that is, to other people. But fear is apt to give itself away, especially in the pulse-rate; any houseman can learn to spot the initial signs of fear, and he should act on them at once; indeed, he should act first, whenever possible, by explaining the patient's illness and treatment to him, for this can almost always be done in a manner to allay rather than increase alarm. Patients may be childish at times, but they are not imbeciles.

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ANDARDISATION OF TRANSFUSION EQUIPMENT

At a meeting in Oslo last month representatives of rway, Sweden, and Denmark decided to adopt a common ndard for equipment used in blood-transfusion. e equipment chosen is similar to the British, and y part can be used with a British set. The benefit this arrangement is that standard bottles filled in y one of these countries can be readily used for nsfusion in either of the others. In the Inter-Nordic ndards Association the Scandinavian countries have effective body for the arrangement of agreed standards. e obvious advantages of standard equipment may suade the countries of the Western Union to follow andinavia's example.

THE HYPERTENSIVE'S LIFE-SPAN

Despite the prevalence of essential hypertension, ctors are still unable to estimate with any confidence effect on the expectation of life. A report published ely in the United States suggests that this effect is r less than is usually supposed. From his private e-records, dating back to 1914, Burgess[1] chose the st hundred patients with essential hypertension who re found to have a blood-pressure of 180/100 mm. Hg more and who were alive eight or more years after-rds (aiming in this way to exclude any cases of lignant hypertension). Of these hundred patients ty were found to have had hypertension before [illegible], while the remainder were first observed between [illegible] and 1936. In 1947, forty-seven were still alive, fifty-three had died. Of those alive, the average ion of life since the hypertension was discovered 16·9 years, compared with an average expectation life of 21·6 years. The comparable figures for those had died was 14·2 and 17·8 years. Taking all ients together, the figures were 15·7 years for the tual duration and 19·8 years for the expectation. ery patient who was 65 years or older when the ypertension was first noted attained the life expec-tion.

Of greater interest is the analysis of the thirty-two tients in whom the hypertension was discovered at before the age of 50. Of these, twelve had died, aving lived an average of 15 years, compared with an pectation of 26 years. The twenty survivors had lived n average of 18 years since the hypertension was first oted, compared with an average expectation of 29·4 ears; all but three of these patients are leading normal ves without symptoms. Of the twenty-seven patients ith a systolic pressure of 250 mm. Hg or more at some ime or other while under observation, the duration of fe for the nine still alive had been 19·1 years (compared ith an average expectation of 22·9 years), while the ighteen who had died had an average duration of 16 years (compared with an expectation of 18·5 years). The significance of these observations is enhanced by the fact that the five patients in whom a reading of 300 mm. Hg or more was recorded on one or more occasions, had an average duration of life slightly in xcess of the normal. In striking contrast is the position of those with severe diastolic hypertension. Of fifty patients with a diastolic pressure of 120 mm. Hg or over, twenty were still alive, with an average duration of life of 17·8 years (compared with an expectation of 24 years). For the thirty who had died the comparable figures were 14·6 and 21·7 years. Of those with diastolic pressures under 120 mm. Hg, twenty-seven were alive with an average duration of life of 16·2 years (compared with an average expectation of 20 years), and twenty-three had died having lived an average of 14·7 years since the hypertension was first noted (compared with an average expectation of 16·6 years). Taking the group as a whole, the shortest duration of life after the discovery of hypertension was 9 years and the longest was 25 years. In other words, the patient with the type of hypertension dealt with in this report usually lives to within 3–4 years of his normal expectation of life. The younger the age at which hypertension develops, the less likely is the individual to live out his full life-span; yet the average expectation of-life for those developing hypertension under the age of 50 is over 15 years.

This study suggests that, irrespective of age, sex, or whether or not the diastolic pressure is below 120 mm. Hg, these patients will probably live for 14–19 years. Though based on a small series the analysis raises the question, which Burgess himself asks, whether any patient with non-progressive benign hypertension should be subjected to such a serious operation as sympathectomy. As Dr. Horace Evans remarked last month to the Devon and Exeter Medico-Chirurgical Society, surgical treatment for the relief of high blood-pressure is nowadays too lightly undertaken.

SICKNESS IN THE POST OFFICE

Too often the reporting of morbidity statistics becomes first a formal routine and then a meaningless ritual; but there is nothing mechanical about the report on the health of Post Office workers by their chief medical officer, Dr. Cecil Roberts.[1]

As Roberts says, sickness-rates cannot be intelligently interpreted except against a background of the policies of personnel management and the selection and invaliding standards of the medical advisers. Thus, in the long history of sickness recording in the Post Office since 1891, the annual sickness-rate is clearly associated with the invaliding policy effective at the time: an invaliding-rate raised by the discharge on medical grounds of the chronic-sick absentee was associated with a low sick-absence rate, and vice versa. Purely statistical factors also enter the picture. Studies by the Government Actuary's department have reaffirmed the prime importance of age and sex composition in determining a population's sickness experience. As in the country as a whole, the Post Office has been facing the problems of an ageing working population. Some, if not all, of the increase in sickness absence in recent years derives from the increase in the average age of Post Office workers, and the rise in sick-absence rates between the wars need not have been attributed to failure in morale. Had age-sex standardisation of the rates been carried out, much of the apparent increase would no doubt have been eliminated.

Unfortunately the lack of the basic data for such a correction also impedes the comparisons made between the sickness experience of different occupational groups within the Post Office, but some interesting distinctions have nevertheless been drawn. "The hard core of male sick-absence problems is to be found among the big battalions of the postmen"—and the reason is not far to seek. During the war postmen were not on the reserved schedule; young fit men were called up and replaced by women and elderly men who were unequal to the consistent monotonous grind of the postman's day. Sickness among engineering workmen, on the other of their "mentions"; and a conference will then be arranged of the people and bodies who contributed the names. It may turn out that many "mentions" do not necessarily mean a problem family, and this is one of the things the survey sets out to test. Some of the families on the consolidated list will probably be excluded as outside the range of the inquiry, and a shorter list of possible problem families will be compiled and assessed at first hand by a health worker. As a result of her visits to the home the list will doubtless be still further reduced. For each of the remaining, authentic, problem families a card will be filled in and sent to the committee's headquarters where the results will be examined and analysed. The six areas to be surveyed are Bristol, Warwickshire, Luton, Rotherham, West Riding, and Kensington—a reasonable cross-section of England, since they include a port, a metropolitan borough, two administrative counties in the Midlands, a county borough, and an actively growing industrial town. (Two of the areas include rural districts.) These surveys should widen our knowledge considerably and clear the way for the next step—treatment.

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[1] Burgess, A. M. *New Engl. J. Med.* 1948, 239, 75.

[1] *Mon. Bull. Min. Hlth P.H.L.S.* September, 1948, p. 184.

SCHOOL FEEDING

Mr. F. Le Gros Clark sees school meals as more than a useful safeguard of the nutrition of children. In a new booklet[1] on the history of their development he comments on two important educational aspects of the service: it must establish, over the course of a generation, a flexible and wholesome set of food habits, and it must initiate the child into good social habits at the same time. "We cannot," he says, "make the child tolerant, self-reliant and easy-mannered in the abstract; we have to choose some medium through which these qualities can be imparted to him. For such a purpose the meal table is ideal."

School feeding, like so many other social services, was begun by voluntary bodies. In the late '80s of the last century schemes for providing free school meals were numerous and increasing; and in 1889, on the initiative of the London School Board, a School Dinners Association was formed. By 1906—when the first Act permitting the provision of these meals by local authorities was passed by Parliament—Manchester, Birmingham, Bradford, Glasgow, and several other boroughs were already supporting private funds of some size. The first Provision of Meals Act, which gave local authorities the power to supply meals to necessitous children from the proceeds of a ½d. rate, had plenty of opposition. Taxpayers, it was said, were already overburdened, and the families of children who were freely fed would be pauperised. The Board of Education, however, was quietly determined that the provision of meals should be a medical and educational measure; and this was achieved, though, as result of opposition from the Lords, Scotland was excluded from the Act. Nevertheless, the business of deciding which children were necessitous enough to be fed was still claiming more attention than was the type of food to be provided or the manner in which it was to be served. When the School Medical Service was founded, a year or two later, the task of selecting children was placed in the hands of the school doctor; but there were administrative difficulties about this. Moreover, the necessitous child was fed only on school days and went hungry during holidays. Nevertheless the numbers of children being fed rose gradually if not spectacularly—in London from 29,000 weekly in 1906 to 41,000 weekly in 1911; but as might be expected charitable donations towards school meals declined, falling from £17,000 in 1908 to £950 in 1914 when the next Act was passed. Under this Act, the powers of the local authorities to provide meals were still permissive, but they were n longer expected to do it on the yield of a ½d. rate. bad time followed: the Act was passed on the da war broke out, and Government policy at that tim was the reverse of that in the recent war. During th first year of war 420,000 children received meals, but l the last year only 43,000 were getting them, and th decline was encouraged by the Minister of Food. In th postwar depression the Geddes axe aimed anoth dangerous blow at the scheme: in 1922 the board grant was restricted, and authorities were instruct to show economies. During the whole period of t peace the proportion of children receiving meals rare rose above 3·5%, and sometimes fell to 2%. Towar the close of the '20s the custom of providing milk schools became more general, and a growing number authorities accepted this partial measure as a soluti of their difficulties.

In the '30s a change came; the boroughs were beg ning to concentrate on the provision of free meals poorly nourished children, while the counties, thou providing meals on payment in a few rural schools, w making little attempt to provide free meals. The paren too, still hung back, seeing free school meals as a form charity. The 1939–45 war had the effect of reversing t prejudice, we may hope for good. The Governmen policy of feeding the children led to a wide developm of the school meals service, at first in the reception ar and later throughout the country. It was an extraor nary achievement, raising the percentage of elementa school children receiving meals from 11·4 in 1942 33·8 in 1945. Even so, the parents had to be persuac to accept the scheme by a completely fresh approa The figure is still far below the 75% proposed as a tar by the Government, but it represents an advance in sense of social responsibility which it would have b hard to imagine a hundred, or even fifty, years ago.

TREATMENT OF THYROTOXICOSIS

WHEN the Medical Society of London discussed thy toxicosis eighteen months ago,[1] most speakers prefer surgical methods to treatment by thiouracil. Deali with the same topic last month, members of the Liverpo Medical Institution took a rather more kindly view this drug. Neither method, as Mr. Philip Hawe point out, is ideal; and each is used best only by care selection of cases. He suggested that all well-defin nodular goitres and most goitres in elderly patien especially when associated with cardiac complicatio should be considered for operation, while the you patient with a diffuse goitre should have a trial thiouracil; for the many intermediate cases there be no hard-and-fast rule. He has had gratifying resu in preoperative treatment with thiouracil followed by course of iodine. Since the war, he observed, po operative crises seem almost to have disappeare possibly because of improved preoperative care. A. M. Abrahams mentioned his impression that t disease itself has become less severe.

Some of the essential factors in causation are st unknown; and Prof. Henry Cohen remarked that t clinical picture of thyroid affections shows that thyr toxicosis and hyperthyroidism are not synonymou though the former includes the latter. Moreover, th diverse patterns of thyrotoxicosis suggest that it may b the expression of more than one ætiological factor, an that the susceptibility of different tissues to thyroxin and their capacity to use it, may modify the clinica picture. Thiouracil and radioactive iodine do not attac extrathyroid causative factors; but despite toxic hazard the risk of mechanical difficulties from swelling of th goitre, and the possibility of overlooking malignant

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[1] Social History of the School Meals Service. Published for the London Council of Social Service by the National Council of Social Service, 26, Bedford Square, London, W.C.1. Pp. 28. 2s.

[1] See *Lancet*, 1947, i, 370.

Special Articles

SIMPLE STATISTICS OF CANCER *

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I BEGIN with the story of a failure which points a al. It is told at length in two volumes published the League of Nations Health Organisation (1925).

It had been noted that, at that time, the rates of ality from cancer of the breast in age-groups were h lower in the Netherlands than in England and les; indeed in some age-groups the rates in England Wales were more than 50% greater than in the herlands. It was tempting to suppose that this trast might be due to causes—such as earlier resort ospitals in the Netherlands—which could be brought ight by statistical investigation.

n international committee of experts, statistical, ological, clinical, and administrative, was appointed worked in complete harmony for many months. y interesting statistical tables were compiled, but the end no conclusion was reached. The Dutch erts were " inclined to admit that in England cancer the breast is a more malignant process than in the herlands," but they recognised that this conclusion vague, and it certainly recalls the candidate's answer he question : " *Quare opium facit dormire ?* "—" *Quia in eo virtus dormitiva.*" Perhaps the failure of the uiry was due to the difficulty, amounting to impossi- ty, of making a point-to-point comparison of *all* circumstances in the ordinary lives of women of two stries which might be relevant. What seemed a ple problem was too difficult.

etween 1920 and 1930 the Ministry of Health issued ts dealing with cancer of the breast, uterus, and and the "natural" duration of cancer. The plan was to assess, by comparing survivorships, nefits of treatments of different kinds and instituted erent stages of the disease.

e logician will ask for a control—i.e., an adequate ber of patients, observed from the onset of the se until death, who had received no treatment h could reasonably be supposed to influence the e of the illness. As all medical men know, data isfactory to the logician cannot be had. Greenwood 26) published the best available ; they recorded the gths of life of a large number of patients who had not en radically treated from the date of reputed onset the disease. The numbers were respectable—651 ith cancer of the breast, 1749 with cancer of the uterus, d 887 with cancer of the rectum.

The returns from different institutions were remarkably sistent. Thus five different recorders contributed ta of cancer of the breast ; the mean duration in the al was 38·3 months, and the range from 30·2 (a very rt series) to 39·8. But this control is vulnerable to h medical and statistical criticism. Medically speak- all we know is the date when a patient said he or had first noticed something wrong. Not only might memory be at fault, but also the power of recognising ns and symptoms must be a function of the patient's ychological make-up ; a more observant or more nsitive person will give an earlier date of onset than ill one of more stoical or stolid mould, though in both he pathological evolution may be at the same point. Statistically speaking, one must object that most of the ata relate to patients in institutions : they are a selection, not a random sample of patients with cancer, and the average durations may be too long if cases of rapid evolution are under-represented.

These data were published in 1926. May we not expect better data soon ? Methods of recording and mechanically tabulating have greatly improved, and it is hoped that pooling of information will become general. It will never, I think, be possible to avoid indetermination of the exact onset, but it will certainly be possible to remove the suspicion of bias in the sample, if the data assembled are numerous enough.

Apart from " natural " duration as a control of the results of operations, a thorough statistical-medical study of the course of inoperable cancer is of value. There have been in the past, and will be in the future, beliefs that some substance, natural or artificial, will reduce the pain of operable cancer, lead to arrest of the growth, or produce some other beneficial result. Often clinical records of such benefits have been cited, but our profession was never impressed. All medical practitioners of wide experience knew that the vicissitudes of mortal sickness, whether of cancer or cardiac disease, were almost infinite. They did not think it necessary to collect statistical evidence and the public did not expect them to do so.

STATISTICS

In the last forty years the public has become statistically minded—perhaps at a faster rate than our profession. If the inventor of a cure or a palliative is able to produce statistical data consistent with his claim that in a sensible proportion of his patients the swelling has diminished, that there has been less pain, or some other improvement has followed the exhibition of his remedy, then a public accustomed to statistical arguments is not satisfied by a general rejoinder that all these things may and do happen without the use of any remedy. The retort is—Where are your statistics ?

Where are they ? The answer is that the raw material of such statistics is to be found in the case-books of some practitioners and the notes—perhaps the ward sister's reports—of hospitals and institutions harbouring patients incurably sick. No statistics exist, because from the medical point of view it has not been worth while to collate the information. It would be a laborious task and give no help at all in treatment. But it might have great value in another field ; it might convince an unprejudiced layman that changes attributed to a new treatment *did* often occur without it ; it might save bitter disappointment.

We live in an age of mechanism and technicians ; coding of clinical notes and mechanical tabulation can now save human labour to such an extent that what, in my submission, is required can be had without any waste of time which could be better employed.

ASSESSMENT OF SURGICAL RESULTS

The reports already mentioned contain impressive evidence, presented in the statistical form which is now acceptable to many more readers than a generation ago, of the value of early treatment. Reporting on the late results of operation for cancer of the breast, Dr. Janet Lane-Claypon (1928) gives a table showing the proportions surviving from operation per 1000, and the survivorship of the general population of women aged 50 (about the average age at operation). Of the general population, 936 out of 1000 will survive at least five years, and 852 out of 1000 will survive ten years. Of women operated on without infection of the axillary glands (pathologically verified) 730 survived at least five, and 603 at least ten, years. Of 1000 operated on when the disease was no longer local, 266 survived at least five, and 142 at least ten, years. I cite no more figures, because the results of twenty years ago may be obsolete, hand, was remarkably low. This was not entirely the result of a lower average age but was more the expression of the satisfaction which those men (by nature, training, and occupation all skilled craftsmen) derived from the completion of their duty and the camaraderie of the groups in which they worked. Whether that work was a light intricate indoor task or arduous labour in rough weather seemed irrelevant, and morale was the decisive factor. Sorting clerks and telegraphists also had a favourable sickness experience—the result, Roberts thinks, of the smoothly efficient unharassed routine of skilled work in a comfortable environment.

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* Abstract of a lecture delivered at the Royal College of Surgeon of England on March 4, 1948.

Regional differences appear to exist. Scots will be gratified, if not surprised, by the statistical demonstration of their race's hardihood in the relatively low sick-absence rates obtaining there in all grades of the service. In England, the Home Counties have the best record, but London itself, although better than the North-West region is worse than the remainder of the country. Indeed, sick-absence rates seem to be almost proportional to the size of the town where offices are sited.

Environmental manipulation, however, is not the only concern of the industrial physician. More and more, men and machines must be fitted together by the precise assessment of each man's capabilities and limitations, whether physical or psychological, and by the design of machines which make the least demands on human skill and endurance. In this and other human problems of the manifold occupations of the Civil Service, Roberts believes, there is a limitless opportunity for extension in the field of medical care, where the Post Office has been so notable a pioneer.

RATE OF BLOOD-FLOW

To ascertain the rate at which blood flows through the vessels, various injectable substances have been used. As early as 1927 Blumgart and Weiss[1] were employing a radioactive substance, thorium X, and in our present issue Dr. Payling Wright and her colleagues describe their findings with the radioactive isotope Na^{24}. Their object was to discover how quickly this substance passed from a vein in the foot to the femoral vein, temperature being roughly controlled by warming the subject under an electric blanket until the foot temperature was approximately 33°C. The results show a wide scatter, and there was no change in the time values when the leg was further heated at 45–48°C. This rise in temperature would be expected to increase skin and muscle blood-flow; but if the capacity of the particular venous pathway under investigation increased in parallel with the blood-flow, then the rate of movement might well show little change. The capacity of the veins is known to depend on temperature, pressure, and nervous influences; and the factors influencing the circulation-rate are no doubt complex. In the heart interpretation may prove to be even more difficult. Prinzmetal and his associates[2] found that, with a Geiger-Müller counter over the precordium, intravenous injection of Na^{24} was followed in normal subjects by two main waves, due to the presence of tracer element in the right side and then in the left side of the heart; while in heart-failure a prolonged monophasic curve was observed. With this condition and with considerable cardiac enlargement, mixing difficulties probably play a part.[3] Smith and Quimby[4] found that the arm-to-sole-of-foot Na^{24} time was actually below normal in some cases of Buerger's disease, and for assessing arterial disease of the legs they appear more recently[5] to have discarded the measurement of circulation-time in favour of the uptake-rate in the sole of the foot. The information obtainabl by measurement with radioactive agents could of cour be supplemented by concurrent use of establishe techniques for measuring blood flow and pressure.

VISCEROPTOSIS AND PAIN IN THE LEGS

NEURITIS affecting the lateral femoral cutaneous ner as an isolated syndrome was first described by Bernhardt in 1895, and soon afterwards it was named meralg paræsthetica by Roth.[2] Its causes have always bee a bit of a puzzle. A suggestion from the Argentine that some cases are due to pressure of the viscera o nerves during their intra-abdominal course. Guilhe, Buenos Aires, found that in one patient with meralg paræsthetica the pain disappeared if he stood behin the erect patient and embraced the lower part of h abdomen, and that it reappeared when the viscera we allowed to drop again. The meralgia also disappear when the patient lay on his back. Obarrio and Guilhe have seen 6 further cases, all in middle-aged people wi a lax pot belly, and all have been immediately relieve by an abdominal belt. Subsequently Obarrio[4] saw cases in which sciatica associated with pain suggesti of intermittent claudication was relieved by an abdomin belt. Two of these patients also had meralgia paræ thetica, which was similarly affected. Lately he and h colleagues[5] have described 2 cases of "intermitte claudication" and "abdominogenital neuritis," one which was complicated by meralgia paræsthetica on th same side and sciatica on both sides. These patients we women, and in both the pain disappeared on lying dow and was permanently relieved by an abdominal belt.

EMPIRE RHEUMATISM COUNCIL

IN industry alone rheumatic disease accounts ea year for the loss of 3 million weeks of work, and th annual cost to industry is about £20 million. Th estimate was given last week by H.R.H. the Duke Gloucester, presiding at the Empire Rheumatis Council's annual meeting at St. James's Palace. T rheumatic diseases, he said, had in the past been "th most neglected of all human afflictions in the fiel of research." As chairman, Lord Horder reported th continuance of the council's full-scale investigation int the causation of rheumatoid arthritis, and of its researc into the allergic aspects of rheumatism. The counc has lately issued a standard case-sheet which, Lor Horder suggested, may soon become the accepte case-sheet for world rheumatic practice. The counc has also extended its educational responsibilities b increasing the lecture courses given at the Apothecaries Hall; these have been well attended. Integration wit medical bodies in other countries is constantly improving For example, the Canadian Rheumatism and Arthriti Society and the Royal Australian College of Physician are considering affiliation as autonomous branches and a New Zealand branch is to be inaugurated wit a two-day meeting at Rotorua on Nov. 18 and 19 During the past year the council's income has fallen considerably—owing, the finance committee suggests, to a popular misbelief that voluntary contributions are no longer needed.

Dr. E. D. PRIDIE has been appointed Chief Medical Officer, Colonial Office.

THE next session of the General Medical Council will open on Tuesday, Nov. 23, at 2 P.M., when Sir Herbert Eason, the president, will deliver an address.

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row forms and draughty corridors of which I had rd. But the appointments system proved a disointment. Its primary purpose seemed to be to vent an accumulation of too many people on any day; there was apparently no intention that ients should see their doctors at the appointed time. ny people were given appointments for the same tor at the same hour, and only a few lucky ones early the day were promptly attended.

One day, after waiting for two hours, I had to leave hout seeing the doctor, because I had another engagent. When I complained to the receptionist, she lied: "I am always telling patients that they must pect to spend the whole morning in hospital; if they sh earlier, they are lucky." I realise, of course, t this is an ideal state of affairs compared with ditions in some hospitals where people may have wait the whole day. One large teaching hospital, am told, still applies the principle of men first in its patient clinics. Women are supposed to have nothing portant to do, and they have to wait indefinitely, en with their small children. It is almost unbelievable t an institution which employs the latest devices medicine should ignore the obligations of women.

My own hospital was not as bad as that, but it bore ny traces of the past, when the sick poor formed clientèle. What private doctor would ask his recepnist to call three patients into his consulting-room at same time? Some of these patients sought advice gynæcological complaints. Their conversations with doctor were in whispers, and they were embarrassed the presence of other people at the back of the room. se who wait for medical care are the last to underimate the value of a doctor's time, but there are its which neither hospital nor doctor should exceed. appointments system appeared to be based on the ciple that a minute of the doctor's time was more able than an hour of the patient's.

THE INPATIENT

first two impressions on entering hospital were of personality and noise. They remained with me the time I was there. Nothing softened the first k—for it is a shock to enter a 20-bed ward, however h one may have known before about large public rds. The nurses were too busy to bother much about new arrival. A friendly word just then would have n welcome. It would have been a relief to know t the doctor would be round later in the day—as he —or that tea would soon be forthcoming. Nobody med to know that a patient, on arrival, needs more an a bed to lie in and a case for her clothes. It took me to establish contact with the adjoining beds. People pt themselves to themselves, at least as far as comers were concerned.

In hospital many of the rules and politenesses of dinary human relationships are suspended. You are ked questions by all kinds of people whom you have ver seen before and who do not tell you who they e. You have to distinguish between a variety of uniforms and white coats: sisters and nurses, househysicians, medical students, physiotherapists. When atron makes her daily round, there is a hush in the ward; you are expected to know her and to give an ptimistic answer to her question about your health. radually you learn all these things from whispered conversations with other patients. It would be so much impler if these people, when they address you with your name, would also mention who they are, just as they would in ordinary social or business life. I fear it is no accident that this is not done. As a hospital patient, you have a different human status from the one you had outside.

TEACHING MATERIAL

The bedside lecture, although I had expected it, was an ordeal, and I wonder whether the same educational purpose could not be served at smaller human cost. I remember lying in bed motionless, waiting for the event. Its significance had been impressed on me by a change of the top sheet and a last-minute tidying. When doctors and students had gathered around, I was politely asked how I was and where the pain was. Then I was disregarded. For ten minutes or more they talked about me and similar cases as if I were not there. At the end of their incomprehensible conversation, when all my fears and suspicions had been aroused, they left me suddenly, without an explanation or so much as a nod of their heads.

I did not see the teaching specialist alone. I did not have a single private word with the doctor in charge of my case. I never saw him, except in the presence of at least three students, two other doctors, and the ward sister. He is, no doubt, a busy man, but should it not be part of his job to answer his patients' questions? I recognise the demands of medical education. Whenever students asked me questions and examined me, I felt an obligation to be as helpful as possible, even when I was tired. I even accept the bedside lecture as an unavoidable necessity. But I do object to being turned from a human being into medical teaching material. This is a question of manners and approach. Today there is no special group of patients compelled to pay for their medical care by accepting inconvenience and perhaps even indignity. Medical education depends more and more on the voluntary and ready coöperation of sick people of all classes, and later, when I was transferred to another hospital, I saw that a different approach is possible. There a patient told me how she had been asked, as a favour, to attend in the lecture hall. It had been made clear to her that she could refuse if she wished. "They had been so kind to me; I felt I wanted to help them." Her case was discussed in the presence of many students for half an hour, and before she was wheeled back to the ward the professor expressed his appreciation of her helpfulness. He saw her alone in the ward on his usual round later on.

THEY DON'T TELL YOU ANYTHING

Why should an adult cease to be regarded as a normal and reasonable human being merely because he is in hospital? I am not talking about patients who are desperately ill or in great pain, but of people in full command of their senses, some of them out of bed for part of the day. They were all treated more or less like children, with firm friendliness and occasional severity. They were ordered about, humoured, talked down to, but they were rarely taken seriously. I sometimes felt like a prisoner, surrounded by an impenetrable wall of enforced, artificial cheeriness.

In and out of hospital, doctors tend to appeal too little to the patient's reason. Sometimes a pat on the back and a bottle of medicine may be the best treatment; it is certainly the most time-saving and the easiest in the short run. It is much more difficult to adapt explanations and answers to the psychological and intellectual capacities of the patient. In hospitals, where doctors and nurses know practically nothing about the individual patient, there is even more temptation to choose the simplest way. "They don't tell you anything," was the complaint of practically every patient to whom I talked. It came spontaneously, as the first reaction to every doctor's round.

Do doctors realise how much unnecessary worry and fear can be caused by the failure to say the right thing at the right time? I shall not easily forget the two elderly women who had been told that a new method of and I need not discuss the importance of following-up in detail.

It is obvious that if, a year after operation, of 1000 patients 800 are still alive, 100 are dead, and nothing is known of the fates of the remaining 100, the true proportion of survivors cannot be more than 900 or less than 800, and is probably a little nearer 900 than 800. In actual work the number lost sight of is not usually of the order of magnitude suggested in the example, *at least* in the first few years after operation. But it is important to remind statisticians without medical experience who handle surgical data that in the past a primary factor of successful following up has been the interest of the surgeon. There is still gratitude in the world, and patients are sometimes grateful to their surgeon, willing, even anxious, to answer a letter from *him*. They will neither owe nor feel any gratitude to a statistical officer or even a research committee. This is well brought out by Fulton (1946) in his biography of Harvey Cushing. After quoting some letters, Fulton writes :

> "This exchange is mentioned to illustrate H.C.'s unusual faculty for remembering his patients and keeping in touch with them. During 1905 he began to request all his neurosurgical patients to write to him on the anniversary of their operations. This practice enabled him over the years to collect data concerning the end-results of his operations, and ultimately to learn of the probable life expectancy of patients having any particular type of tumour. At the time of his death in 1939 he was following nearly 1000 of his living cases of verified brain tumour. If by any chance a patient did not write on the anniversary of the operation, a reminder was promptly sent."

Provided there is a cordial partnership between surgeon and statistician, I suggest that within another decade we might have surgical statistics which would solve many practical problems and also save many lives by educating the general public. But there are difficulties to be overcome ; we must recognise the limitations of the statistical method and the anfractuosities of human temperament.

A statistical analysis can answer the question whether, on the average, method A gives better results than method B, and no other question. To answer that question we must pool the results of many surgeons using method A and pool the results of many surgeons using method B—enough to weaken if not obliterate the influence of personal equation. Suppose we have done this and obtained a difference in favour of method A which is highly significant in both the statistical and colloquial sense of that over-worked adjective, it does not follow that even an authoritarian government should forbid the use of method B. Surgery is an art as well as a science ; and, even when the material, the patient, does not change—as it always does—a preference for a particular technique which, on the average, gives worse results, may be justified by the special skill of the surgeon or particular features of the case. The Evans gambit is seldom played in the chess tournaments of modern masters, but were Tchigorine still alive he would probably often play it and win ; even in his time statistics were against him, but he could take risks and win. He was an artist. Averages are for the instruction of ordinary people. Not to recognise that is as unwise as to fly to the opposite extreme and to credit the great artist with infallible judgment. The latter mistake was made often enough forty years ago, when clinicians and pathologists despised mere statisticians ; but now statisticians, if still regarded as nuisances, are accepted as inevitable nuisances, and there is even a danger that the clinician may expect too much from the mere statistician.

In my view useful clinical statistics can only be produced by the coöperation of surgeon (or physician) and statistician. It is not asking too much of the statistician who has had *no* medical training to expe him to have read carefully an account of the gener principles of surgical treatment in malignant disease a so far to have mastered it that he can listen intelligent to a surgeon's criticism of the planning or interpretation a statistical analysis. Even a very busy surgeon aller to algebra would not find the principles of rand sampling too difficult to master ; the collaborators c surely be in charity one with the other.

The statistical investigations described here are simp but they will not be carried out quickly or easily and th will not lead to dramatic epoch-making discoveri Yet they will, I think, save human lives. Perhaps these times of excitement we are apt to despise sim things.

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Ministry of Health (1926) *Rep. publ. Hlth med. Subj., Lond.* no. 3
— (1927) *Ibid*, no. 46.

TWO HOSPITALS

BY A PATIENT

A FEW months ago I spent some weeks as a patie in two London voluntary hospitals. I have be wondering ever since how much doctors know about effect of hospitals on patients. I am not a doctor a I would not presume to judge the medical care I receiv Standards were probably high, as I was in teach hospitals of great reputation. When I saw the wh machinery of medicine in action, I was impres No effort and no expense seemed to be too great. B there seemed to be an almost unbridgeable gulf betwe those who occupied the beds and those who did th work, and I could not help comparing the efficienc of a great hospital at work with its comparative negle of human needs.

I do not know how far my own experiences are typic I can only say that they were confirmed by many my friends. I was unhappy and annoyed about th same things as other people, but I could not share th view of so many resigned ex-patients that nothing all could be done about it. Why should hospitals hav different standards and a different scale of values fro those accepted outside ?

It is natural that people should fear operations painful forms of treatment, but why *should* they fe being in hospital ? I had never shared this gener fear and had always prided myself on *being* reasonabl When I fell ill I was eager to be admitted and car for by trained people. Today I am *less* reasonable If I had to go again, I would be afraid.

THE OUTPATIENT

When my doctor provided me with a hospital letter he said "This is a hospital with an appointment scheme, and waiting has been practically abolished." He did not know that some words have different meaning in hospital and elsewhere. The appointments list wa overcrowded and my first visit was delayed for thre weeks. When I entered the large, light waiting-room with its coloured chairs and its tea-counter in the corner, I was pleasantly reassured. There was no sign of th did many things which, in current opinion, might undermined her authority; in fact they only thened it and made us like her more. One of cleaners told me what a kind, understanding person was, and the cleaner herself was introduced to by one of the patients as "our ray of sunshine." house doctors seemed to be on excellent terms the nurses and ready to lend a hand at difficult nts. These happy relationships between the nt members of the staff were, I felt, reflected ourselves.

hospital, like the other, suffered from severe staff ages. Yet there was time for sister to supervise nts' meals and for a friendly word where it was ed to make the patient feel at home. It is true here, too, questions were not encouraged and the ground of the patients remained unknown, the alist was difficult to approach, and the day started wn. But these things were easier to bear because the at was treated as a person and felt like an individual. the first hospital an elderly nurse once said to me: trouble with you is that you should have gone a private ward." This remark showed more effec- ly than any description the kind of approach which that hospital so unattractive. The other can, ps, be best described by quoting the private patient said to me on her discharge: "I wish I had gone the public ward."

ACCIDENTAL INJURIES

Treatment and Prevention

EAKING before the section of epidemiology and medicine of the Royal Society of Medicine on 1, Mr. W. GISSANE suggested that accident cases too often treated too late or by medical personnel uately trained for the task. In hospitals suitable ral arrangements and modern equipment were d for this purpose, and team-work was necessary reasonably good results. Adequate after-treat- nd follow-up were desirable, preferably by the team. He felt that while prevention of the actual ts might be a very stubborn problem, the preven- of crippling results was something which could be d immediately.

LEONARD COLEBROOK, F.R.S., analysed a Birming- series of 736 accident cases, of which 504 occured home and 232 in industry. The fatality-rate the home accidents was six times that of the industrial ents, and the average stay in hospital approximately longer, owing largely to the more serious nature of ents in the home, and especially to burns and in children and old people. Epilepsy accounted a third of the home burns, which were due mainly to and other hot liquids, coal fires, electric and gas fires, left unattended, and inflammable liquids; electrical and conflagrations were very infrequent causes. Colebrook emphasised the need for prompt admission pital without prior treatment apart from protection the damaged part.

Dr. C. A. BOUCHER said that more than 8000 people killed every year in England and Wales as a result accidents at home and in everyday pursuits. Of fatal accidents 6000 took place in the home—h represented about 40% of all fatal accidents, ding road accidents, transport accidents, and mine dents. There had been no fall in the figure since and in the age-groups under 5 and over 65 there been an increase. In 1945 some 20% of fatalities in children under 5, and about 50% in people over falls being the main cause in the latter group. Over- ding in the home was an important causative or, especially in accidents affecting children. Dr. her drew attention to the perils of neglect of the dangers in the home and of using cheap and faulty appliances which looked tempting in the shops. The Royal Society for the Prevention of Accidents had shown great energy and imagination in drawing attention to the dangers. Furthermore, in 1947, an Interdepartmental Committee on Accidents in the Home had been set up, and a domestic accidents panel of the building requirements subcommittee of the Ministry of Works was already at work. Many local authorities held exhibitions to promote home safety, while local education authorities encouraged teachers to inform the children; films on this subject were circulated by the Central Office of Information. Education and propaganda offered a better hope than legislation. One example of the ineffectiveness of legislation was the provision in the Children and Young Persons Act, 1933, by which anyone over the age of 16 having charge of a child under the age of 7 who was seriously injured or killed because of an insufficiently guarded open firegrate is liable to a fine of up to £10. Nobody could penalise a woman, particularly a mother, for so tragic an accident. He thought that education should be personal rather than impersonal, and felt that the aim should be to make the public critical of goods which they buy, in the hope that in time public opinion would demand safe articles.

Dr. PERCY STOCKS believed that general appeals were unlikely to succeed and that each cause would have to be attacked in detail. It was first necessary to obtain good statistics, and the General Register Office was working to that end. Coroners' certificates were providing more detail than hitherto of the circumstances of fatal accidents; a classification both by nature of injury and cause of accident had been grafted on to the International List, which was not designed for morbidity statistics; and the teaching hospitals were being asked to pay more attention to the causes of accidents.

TRANSVAAL HOSPITALS DISPUTE

FROM A SOUTH AFRICAN CORRESPONDENT

THE dispute which has been going on for three months between the South African Medical Association and the Administration of the Transvaal[1] has at length been settled with the help of Mr. Justice De Villiers, appointed by the minister of health to act as mediator.

Since Aug. 1 the Provincial Administration had been adamant in its intention to implement the Hospital Ordinance, allowing free hospital care to all, and the doctors had been just as adamant in their intention not to operate the scheme unless a "means test" was imposed. Towards the end of October it became obvious that the continual statements from each party, having front-page publicity in the press, were disturbing public confidence. When therefore the parties agreed between themselves to have mediation, and approached the minister of health in the matter, they found that the minister, while making immediate arrangements for a judge to act as mediator, also made an earnest appeal that no more press statements should be issued. The sudden cessation of angry statement and counter-statement in the daily press was very noticeable. Discussions behind closed doors continued for several days before a press statement was issued, that "with pleasure and relief we announce the settlement of the dispute between us."

Agreement has been reached that patients unable to pay shall be given free hospital treatment, while "those well able to afford to pay" will be required to do so. This is a statement on very general lines, and further meetings will have to be held to hammer out the details of the scheme. But agreement and cordiality have been reached, and an indication of this treatment would be started with them the next day. They were worried the whole evening, and they slept little at night. In the morning, after nurse had given them each a glass of watery tasteless liquid to drink, they asked anxiously when the course of treatment would begin and whether it would be very painful. They would not have asked if I had not encouraged them to do so. "But you have just taken the first dose," the nurse answered. Nobody had thought of telling them what to expect.

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[1] See *Lancet*, Oct. 23, p. 661.

This failure to inform the patient seemed to be part of the hospital's failure in human relationships. The patient's physical reactions were studied; his mental reactions received no attention until they caused trouble. Even then, a few meaningless soothing words or a sleeping tablet were usually preferred to a sensible explanation. If only doctors and nurses would understand what a humiliating and sometimes frightening experience it can be to be treated like a semi-imbecile at a time when one is physically helpless. I do not believe a doctor loses authority if he says: "I do not know, but I am doing my best to find out." A day or two before my discharge from the second hospital, I tried to get a general explanation of my case from the house-physician, as the specialist had been more or less unapproachable in the presence of students. He answered my questions readily. It may not have been the full truth, but it satisfied me at the time. When he came again the next day, he asked me smilingly: "Any more questions?" The patient who asks questions in hospital is an unusual phenomenon.

NOISE

When a person is ill at home, people walk on tiptoe and talk with subdued voices. Everybody takes for granted that the rest of a sick person is sacred. In hospital it is different. When I entered I longed for peace and complete rest. Immediately on arrival I received a shock. The noise in the ward almost reduced me to tears.

I soon noticed that its main cause was the stone floor. The nurses told me later how hard it was on their feet. It was also hard on patients' nerves. Things were often dragged over it with a thundering, screeching, and rattling which would have drowned the noise of half-a-dozen typewriters and telephones. I do not know how often I was jerked out of a doze by volumes of sound and hid myself under my blankets to escape. Gradually I learned to distinguish between the rattling of the screens being dragged from one bed to another—their metal wheels were not covered with rubber—the screeching of beds pulled from one end of the ward to the other, and the terrific thunder of a heavy trolley, covered with clattering glass and metal containers. The nurses were so used to the noise that they did not even notice its painful effect upon the patients. In this type of ward even the wish to create a quiet atmosphere disappears, and the patients' need for rest is forgotten. Hospital routine is more important, and patients who fall asleep during the day may be wakened without compunction for unimportant purposes. What was needed was a smaller ward, a different kind of floor, differently fitted trolleys and screens, and greater respect for the patients' comfort.

The hospital day began at an unearthly hour. I know that there are too few nurses to change this now, but the custom existed long before the nursing problem reached its present crisis. It should be abolished as soon as possible. Townspeople do not usually rise shortly after 5 A.M. and fall asleep at 9 P.M.; and they cannot easily adapt themselves to this new daily rhythm. Sleeping tablets were often used—I found them generally far too plentiful. More than once I was aroused from my early sleep to take them.

FOOD AND TOBACCO

To see good food turned into badly planned, carele served, uninspiring meals is always a pity. In hospit where meals are important events and should fo part of the patients' treatment, it is felt even m painfully. Everything connected with the meals show lack of interest, and there was a vague atmosphere the poor-law about it. Even the crockery and cutl were so cheap and bad that the patient was not l in doubt about his social status. The food itself either lukewarm or cold; it was served hurriedly probationers with the help of ambulant patients.

The classical hospital dish, I am told, used to be r pudding. Since the war its place has been taken semolina. I had it for dinner as milk pudding on f consecutive days; on one of them it was preced by semolina-cheese which formed the main dish. retrospect, this sounds laughable; at the time it see like an insult. There were no tomatoes, no fresh fr and only one or two lettuce leaves a week, when these things were abundant on the market. The d was clearly built up on the principle that visitors wo provide what was missing.

Most hospitals allow smoking between certain hou but in my hospital the matron "did not like it." Doct seemed to have no influence in the matter. Even on large balcony adjoining our ward, where many patie spent part of their day, smoking was prohibited. O day, a lonely private patient, sitting in the sun amo the others, blew rings into the air, unknowingly arous widespread class antagonism. I still regret that I not take up the cudgels there and then and light cigarette. But hospital discipline is strong, and smokers among the patients chose an easier way o The lavatories, however, had no locks, and the danger discovery was great, though on the whole the cri seemed to be quietly tolerated because little else co be done.

A DIFFERENT KIND OF HOSPITAL

When I was discharged, I felt as a prisoner must f on the day of his release. But my spell of freedo was short. After a few blissful days at home, I had go to another voluntary teaching hospital for observati When I received their printed notification that a be was available, I expected the worst. The form had be signed in different places. It was addressed to m the patient, and it provided for every contingenc including burial costs.

Fortunately, this first impression proved to be entirel wrong. The form had survived, but the spirit th produced it had disappeared. A wave of warmth an friendliness surrounded me the moment I entered th ward. There were nine beds, and the patients welcome me as a new member of their community. I was offere the most comfortable chair by those who were out o bed, and in the presence of a smiling nurse everybod started to tell me straight away what a pleasant hospita it was.

When lunch arrived a table was laid with mats, glasses and cutlery for those who were not in bed; it coul have been a table in a good hotel. A large heated trolley was pushed into the ward and the food was not only well cooked—"We have a chef here, you know"—but also piping hot. Sister herself shared out, with the help of two nurses, and individual wishes were taken into account. The meal was a happy social occasion.

There was a spirit of comradeship among the patients. and if one of them seemed worried or depressed, tactful attempts would be made to help. Visitors' gifts were often shared, and cakes from friendly relatives turned our afternoon teas into a succession of parties. We were convinced that our ward was the happiest in the hospital, but the neighbouring ward made a similar claim. Our ess on behalf of this court our sympathy with the ily of Polonius, and in particular his daughter, who, am sorry to hear, is indisposed as a result of her sad avement.”

Ophelia, poor child, seems to have died of: 1. (*a*) yxia, due to (*b*) Drowning, due to (*c*) Acute schizonia, with 2. Infatuation for Hamlet as runner-up; ict Accidental death. (The coroner for Elsinore is, ourse, aware of the evidence suggesting that the sed met her death at her own hands; he knows, of the parallel case of Catherine Hamlett of Stratford-Avon, who, when William Shakespeare was yet a , fell out of a willow tree while attempting to water es, circumstances which could only be interpreted lo-de-se but which, out of respect for her family, recorded as death by accident.) Gertrude (“ What ling off was there ”) died of: 1. (*a*) Aspirin, or aps barbiturate, poisoning due to (*b*) Anxiety osis; verdict Accidental death.

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is dreadful series of inquests concluded we could p feeling sorry for that principal witness, Horatio, during the play, himself so nearly took a swig at rin. But all these lamentable deaths would have prevented had the first autopsy been more ghly carried out. Will pathologists who read words please remember in future to examine the s of the ears?

* * *

e dining club described by your correspondent of 16 has certain resemblances to mine, which is approaching the age of 25. We started with six dents—four of them medical—sharing “ digs ” in a nsbury Square whose name the club bears: but we added six so-called honorary members, friends relations of the founders. At first four annual tings were attempted, including a summer meeting Bisley where the secretary annually tries to win the ’s Prize—and once nearly succeeded—and a “ pyronic ” provincial meeting in November. (Some years ago a club yacht was purchased, but only the e leisured members patronise this sport.) Now we are all getting older and busier we have settled o a routine consisting of the annual general meeting Town in January and the more hilarious pyrotechnic ting at some small town in the southern half of the ntry. At the latter, the procedure is as follows: 1) 6.20 P.M. arrival of members from divers directions th fines for lateness); (2) dinner; (3) the company ceeds to some local eminence or place of historic terest, where pyrotechnics are exploded; and (4) return to the hotel, where the secretary reads the minutes d we reminisce over the minute-books. Should any ader have heard the sound of pyrotechnics being ploded on a hill above a well-known Thames-side wn last Saturday about 9 P.M. there was no cause r alarm. It was only us.

Letters to the Editor

MEDICAL GROUP PRACTICE

SIR,—The report in your last issue of the activities of a partnership of five who are described as “ general-practitioner specialists ” raises questions of consequence to the public and the profession.

The group is stated to work in a country town of 10,000 inhabitants with a population of 15,000 in the surrounding country district. Fifteen miles away is a city with a large non-teaching hospital. The partners pool income from all sources. “ The division is assessed mainly on two factors: (1) age and seniority in the group; and (2) the recognised higher earning capacity of surgeon-specialists.” The partners are “ a surgeon-obstetrician (F.R.C.S.E.), a physician (M.D., M.R.C.P.), an anæsthetist (M.B., D.A.), an assistant anæsthetist (M.B.), and a second surgeon (F.R.C.S.E.). The five members of the group all have specialist experience, four out of five having served in the war as specialists in the Services: four out of the five are members of the B.M.A. part-time consultants roll. All members of the group undertake general practice: all, except the senior partner, undertook N.H.I. work.” They form five of the seven members of the staff of the local hospital of 50 beds.

The first object of the group is stated as “ to provide a comprehensive medical service for the patient in his own locality.” The group “ heartily endorse ” an American opinion in favour of group practice because “ consultant’s opinion and treatment can be made available without delay and with the minimum of expense.” Again, it is stated: “ When a consultant is required for an opinion or an operation, the patient is free to choose any specialist inside or outside the group.” It is therefore clear that the partners regard themselves as “ consultants ” or “ specialists.” Exactly what they tackle is not so clear. It is said: “ All routine general surgical and gynæcological operations and abnormal obstetric cases are undertaken, except the more uncommon and the most extensive, which are passed on to specialists with greater experience of these departments. Thoracic and cerebral operations and the more specialised orthopædic procedures are not undertaken.” Only two specific cases are mentioned: details are given of how the group’s surgeon operated upon a diagnosed carcinoma of the cæcum. Elsewhere there is reference to “ a difficult diabetic.”

Surely, Sir, such a partnership of “ general-practitioner specialists,” feeding patients to one another and yet financially linked, is bad both professionally and morally.

In modern medical organisation a man should not be both general practitioner and specialist. The attempt leads to his being an inferior and lopsided G.P. and a pseudo-specialist.

One realises that financial gain is not the main initial motive of such a group. The impulse comes more from professional keenness and a mistaken impression that the pure G.P. is in some way inferior to the specialist, which he certainly is not; he is or should be the equal. The true G.P. is the salt of the profession. The hybrid tends to deem himself too good for the doctoring side of his work, which he is always hoping to shed; his pre-occupation with his specialty prevents balanced development of his general medical knowledge.

A consultant or specialist is not just a man with a higher qualification acquired in his younger days. He is a man who genuinely specialises for the bulk of his professional life and who is on the staff of a large hospital. Incidentally, it would be a valuable advance if every intending consultant was compelled to do six months of general practice (not as a “ general-practitioner specialist ”) as part of his training.

The genuine consultant draws his patients at least from scores, usually from hundreds, of doctors, and he spends his whole time within his specialty in which his range of experience and standard of work is inevitably much higher than is attainable by the “ general-practitioner specialist.”

One of the most important functions of the family doctor is to send his patients needing specialist advice to the specialists likely best to help them. In this he should be completely unfettered in his choice. How is the South African Medical Association's intention to operate the ordinance at once while waiting for the administration to amend it. This means that full hospital services are now in operation again, although it will take some time for the Transvaal Administration to ratify their agreement and alter the legislation. It is proposed that those parts of the ordinance offering free hospital treatment to all should be suspended for three years.

The opinion of the average patient would probably be that "the doctors have won." The S.A.M.A. states, however, that it "was full of admiration for the ordinance; our only submission was that it was premature to try to introduce it in full at present." And looking to the future Dr. J. H. Harvey Pirie, chairman of the augmented executive of the S.A.M.A., has said: "Both the Province and the Medical Association regard this as being in all probability a temporary step towards the establishment of a national health scheme."

Medicine and the Law

Swab Left at Operation

ON Nov. 3 *the Manchester City coroner inquired into* the death of a woman of 27 who died at the Manchester Royal Infirmary. Her gall-bladder and appendix having previously been removed elsewhere, she last year underwent an operation at the Royal Infirmary; after which, the surgeon said, her condition improved steadily for a time. But pain and jaundice later returned, with frequent attacks of fever, and when she re-entered hospital last month she was deeply jaundiced and anæmic. The second operation, to join together two ends of the bile-duct, was performed on Oct. 20: it was very difficult and lasted five hours. After it the patient seemed to be settling down nicely, but complications developed. Post mortem a swab was found, but in the surgeon's opinion its presence had no connexion with the woman's death, which, he would say without hesitation, was due to necrosis following leakage from the pancreas and acute liver failure. A pathologist testified that he found the swab when he was removing the liver: it was like a ball 1½ in. in diameter. The clot of blood and gauze was not infected, and in his view had nothing to do with the death. The patient had died from hæmorrhagic necrosis of the duodenum, following leakage of pancreatic fluid, and acute liver failure.

The theatre nurse said that she began with 24 swabs and later added another 24. Still they had not enough; so she had to cut rolls of gauze to provide 84, making 132 in all. She checked the instruments and swabs after the operation and counted 132 swabs. She had not the slightest doubt they were all there. She could only account for the swab being found by the fact that it might have been a loose strip of gauze, which was sometimes found in a roll. Another nurse suggested that the piece of gauze might have been a piece tucked underneath a roll, to make up the weight, or a piece of the gauze might have been torn from another piece as it was being used.

The coroner said that the final operation was clearly a difficult and hazardous one, but it was a last effort to save the woman's life. It was the duty of the theatre staff to check instruments and swabs correctly, and it was unfortunate that a piece of gauze had been overlooked because it made it necessary for an inquest to be held. According to the medical evidence the presence of the swab had not accelerated death in any way, and he must accept that evidence. He recorded a verdict of death from natural causes.

Conviction for Neglect Quashed

In the Court of Criminal Appeal on Nov. 8 the Lord Chief Justice, Mr. Justice Humphreys, and Mr. Justice Lewis allowed the appeal and quashed the conviction of Miss G. E. Sherwood who was sentenced to one day's imprisonment at Hertfordshire quarter sessions last July for neglecting one of the children in her home at Potters Bar (*Lancet*, July 31, pp. 190 and 200).

In England Now

A Running Commentary by Peripatetic Corresponden

It is written: "At the end of an infinite search philosopher finds himself clinging to laughter as the b of human fruit." Meredith is something to cling when running an African hospital in the bush.

A common Sunday afternoon patient is the pic with *scalds of head and neck.* As a gesture of self generosity (or maybe just atavism) they fall into pots boiling soup. The law heartlessly disallows any m piccin soup, so the chop-mammies pull them out bring them here. We used sulphonamide ointment u a nurse was found smearing on sulphur ointment; st then we have preferred penicillin cream as less liable confusion.

The counter-irritant cuts made by the witch doc are sometimes remarkably effective. It would de the professors to see a patient complaining of pa the loin, vomiting, fever, and headaches displayed be students with the precise surface markings of L.2 map out in neat juju scars.

Umbilical hernias are looked on as adornments rarely cause trouble. Indeed they are a valuable alte tive to the rectum for palpating deep in the pe through the thin burnished skin. On arrival my c was promptly christened Umbo and my steward Abdo for conspicuous anatomical reasons. They co not understand what I was laughing at when they me that "quickly" was *tum-tum.*

* * *

The October meeting was over and the doctors, hav dined convivially in the verandah restaurant overlook the Avon, *now sat in ordered composure to* watch final rendering of the Tragedy of Hamlet. White he grey heads, and bald heads contemplated with m admiration the excellent and realistic production; did Victorian whiskers and frock coats seem out of pl in the court of the ignoble Claudius; indeed, we come prepared for the New Look and an autom telephone on the royal desk, but these we were spa It was only right that we, as doctors, should pass ju ment on this appalling tragedy, for was not a do originally to blame for it? Was it not the Patholo Royal at the court of Elsinore who tripped up on all-important autopsy? Had he searched the Ki body meticulously for evidence of the presumed serpe bite? Had he examined the external auditory mea with a hand lens?

We tolerated the tiresome Polonius, the fickle Gertru and the *platitudinous Horatio, in order* to enjoy t philosophical gravedigger who so honourably uph Adam's profession. Each particular hair stood on e as the darkling officers of the guard watched the pal and aphonic ghost fade in the cheerless air of ea dawn: like them we were "distilled almost to jelly wi the act of fear" as this emphysematous spectre pour out a whole packet of trouble for young Hamlet. As t tragedy unfolded and the news of Ophelia's death w told, our sympathies were with the miserable *Prince* Denmark. Two hours later, the compulsion neuro spent and the greed of Claudius rewarded, our sym pathies were entirely with the coroner for Elsinore, f now, our pulses quickened by Robert Helpmann's fin display of athletic histrionism, we viewed a stage litter with corpses and sullen survivors.

On the homeward journey through the Warwicksh *countryside we prepared* depositions and pink certificat for our friend the coroner. The old King's amende certificate now reads: 1. (*a*) Intravascular clotting, du to (*b*) Instillation of cursed hebona into portals of ear verdict of Wilful murder ("most foul") against Claudiu Polonius died of: 1. (*a*) Hæmopericardium, due t (*b*) Cardiac tamponade (sword-wound), due to (*c*) Eaves dropping, with 2. Cerebral arteriosclerosis (he was stupid old man) as a contributory cause; verdict Misadventure, "*and in bringing in this verdict* I should like to say that no blame whatever attaches to His Royal Highness, who was clearly under the impression that *no-one* was hiding behind the curtain. (*Decent chap* this coroner.) At the same time I should like to ress on behalf of this court our sympathy with the ily of Polonius, and in particular his daughter, who, sorry to hear, is indisposed as a result of her sad vement."

Ophelia, poor child, seems to have died of: 1. (*a*) yxia, due to (*b*) Drowning, due to (*c*) Acute schizo- nia, with 2. Infatuation for Hamlet as runner-up; ict Accidental death. (The coroner for Elsinore is, course, aware of the evidence suggesting that the ed met her death at her own hands; he knows, of the parallel case of Catherine Hamlett of Stratford-Avon, who, when William Shakespeare was yet a , fell out of a willow tree while attempting to water ers, circumstances which could only be interpreted lo-de-se but which, out of respect for her family, recorded as death by accident.) Gertrude ("What ling off was there") died of: 1. (*a*) Aspirin, or aps barbiturate, poisoning due to (*b*) Anxiety osis; verdict Accidental death.

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is dreadful series of inquests concluded we could p feeling sorry for that principal witness, Horatio, during the play, himself so nearly took a swig at ison. But all these lamentable deaths would have prevented had the first autopsy been more oughly carried out. Will pathologists who read words please remember in future to examine the ls of the ears?

* * *

e dining club described by your correspondent of 16 has certain resemblances to mine, which is approaching the age of 25. We started with six dents—four of them medical—sharing "digs" in a msbury Square whose name the club bears; but we added six so-called honorary members, friends relations of the founders. At first four annual tings were attempted, including a summer meeting Bisley where the secretary annually tries to win the g's Prize—and once nearly succeeded—and a "pyro- nic" provincial meeting in November. (Some years ago a club yacht was purchased, but only the e leisured members patronise this sport.) Now we are all getting older and busier we have settled , a routine consisting of the annual general meeting Town in January and the more hilarious pyrotechnic ting at some small town in the southern half of the ntry. At the latter, the procedure is as follows:) 6.30 P.M. arrival of members from divers directions th fines for lateness); (2) dinner; (3) the company ceeds to some local eminence or place of historic terest, where pyrotechnics are exploded; and (4) return the hotel, where the secretary reads the minutes d we reminisce over the minute-books. Should any der have heard the sound of pyrotechnics being ploded on a hill above a well-known Thames-side wn last Saturday about 9 P.M. there was no cause r alarm. It was only us.

Letters to the Editor

MEDICAL GROUP PRACTICE

SIR,—The report in your last issue of the activities of a partnership of five who are described as "general-practitioner specialists" raises questions of consequence to the public and the profession.

The group is stated to work in a country town of 10,000 inhabitants with a population of 15,000 in the surrounding country district. Fifteen miles away is a city with a large non-teaching hospital. The partners pool income from all sources. "The division is assessed mainly on two factors: (1) age and seniority in the group; and (2) the recognised higher earning capacity of surgeon-specialists." The partners are "a surgeon-obstetrician (F.R.C.S.E.), a physician (M.D., M.R.C.P.), an anæsthetist (M.B., D.A.), an assistant anæsthetist (M.B.), and a second surgeon (F.R.C.S.E.). The five members of the group all have specialist experience, four out of five having served in the war as specialists in the Services; four out of the five are members of the B.M.A. part-time consultants roll. All members of the group undertake general practice; all, except the senior partner, undertook N.H.I. work." They form five of the seven members of the staff of the local hospital of 50 beds.

The first object of the group is stated as "to provide a comprehensive medical service for the patient in his own locality." The group "heartily endorse" an American opinion in favour of group practice because "consultant's opinion and treatment can be made available without delay and with the minimum of expense." Again, it is stated: "When a consultant is required for an opinion or an operation, the patient is free to choose any specialist inside or outside the group." It is therefore clear that the partners regard themselves as "consultants" or "specialists." Exactly what they tackle is not so clear. It is said: "All routine general surgical and gynæcological operations and abnormal obstetric cases are undertaken, except the more uncommon and the most extensive, which are passed on to specialists with greater experience of these departments. Thoracic and cerebral operations and the more specialised orthopædic procedures are not undertaken." Only two specific cases are mentioned: details are given of how the group's surgeon operated upon a diagnosed carcinoma of the cæcum. Elsewhere there is reference to "a difficult diabetic."

Surely, Sir, such a partnership of "general-practitioner specialists," feeding patients to one another and yet financially linked, is bad both professionally and morally.

In modern medical organisation a man should not be both general practitioner and specialist. The attempt leads to his being an inferior and lopsided G.P. and a pseudo-specialist.

One realises that financial gain is not the main initial motive of such a group. The impulse comes more from professional keenness and a mistaken impression that the pure G.P. is in some way inferior to the specialist, which he certainly is not; he is or should be the equal. The true G.P. is the salt of the profession. The hybrid tends to deem himself too good for the doctoring side of his work, which he is always hoping to shed; his pre-occupation with his specialty prevents balanced development of his general medical knowledge.

A consultant or specialist is not just a man with a higher qualification acquired in his younger days. He is a man who genuinely specialises for the bulk of his professional life and who is on the staff of a large hospital. Incidentally, it would be a valuable advance if every intending consultant was compelled to do six months of general practice (not as a "general-practitioner specialist") as part of his training.

The genuine consultant draws his patients at least from scores, usually from hundreds, of doctors, and he spends his whole time within his specialty in which his range of experience and standard of work is inevitably much higher than is attainable by the "general-practitioner specialist."

One of the most important functions of the family doctor is to send his patients needing specialist advice to the specialists likely best to help them. In this he should be completely unfettered in his choice. How is the South African Medical Association's intention to operate the ordinance at once while waiting for the administration to amend it. This means that full hospital services are now in operation again, although it will take some time for the Transvaal Administration to ratify their agreement and alter the legislation. It is proposed that those parts of the ordinance offering free hospital treatment to all should be suspended for three years.

The opinion of the average patient would probably be that " the doctors have won." The S.A.M.A. states, however, that it " was full of admiration for the ordinance ; our only submission was that it was premature to try to introduce it in full at present." And looking to the future Dr. J. H. Harvey Pirie, chairman of the augmented executive of the S.A.M.A., has said : " Both the Province and the Medical Association regard this as being in all probability a temporary step towards the establishment of a national health scheme."

Medicine and the Law

Swab Left at Operation

On Nov. 3 the Manchester City coroner inquired into the death of a woman of 27 who died at the Manchester Royal Infirmary. Her gall-bladder and appendix having previously been removed elsewhere, she last year underwent an operation at the Royal Infirmary ; after which, the surgeon said, her condition improved steadily for a time. But pain and jaundice later returned, with frequent attacks of fever, and when she re-entered hospital last month she was deeply jaundiced and anæmic. The second operation, to join together two ends of the bile-duct, was performed on Oct. 20 : it was very difficult and lasted five hours. After it the patient seemed to be settling down nicely, but complications developed. Post mortem a swab was found, but in the surgeon's opinion its presence had no connexion with the woman's death, which, he would say without hesitation, was due to necrosis following leakage from the pancreas and acute liver failure. A pathologist testified that he found the swab when he was removing the liver : it was like a ball 1½ in. in diameter. The clot of blood and gauze was not infected, and in his view had nothing to do with the death. The patient had died from hæmorrhagic necrosis of the duodenum, following leakage of pancreatic fluid, and acute liver failure.

The theatre nurse said that she began with 24 swabs and later added another 24. Still they had not enough ; so she had to cut rolls of gauze to provide 84, making 132 in all. She checked the instruments and swabs after the operation and counted 132 swabs. She had not the slightest doubt they were all there. She could only account for the swab being found by the fact that it might have been a loose strip of gauze, which was sometimes found *in a roll.* Another nurse suggested that the piece of gauze might have been a piece tucked underneath a roll, to make up the weight, or a piece of the gauze might have been torn from another piece as it was being used.

The coroner said that the final operation was clearly a difficult and hazardous one, but it was a last effort to save the woman's life. It was the duty of the theatre staff to check instruments and swabs correctly, and it was unfortunate that a piece of gauze had been overlooked because it made it necessary for an inquest to be held. According to the medical evidence the presence of the swab had not accelerated death in any way, and he must accept that evidence. He recorded a verdict of death from natural causes.

Conviction for Neglect Quashed

In the Court of Criminal Appeal on Nov. 8 the Lord Chief Justice, Mr. Justice Humphreys, and Mr. Justice Lewis allowed the appeal and quashed the conviction of Miss G. E. Sherwood who was sentenced to one day's imprisonment at Hertfordshire quarter sessions last July for neglecting one of the children in her home at Potters Bar (*Lancet,* July 31, pp. 190 and 200).

In England Now

A Running Commentary by Peripatetic Corresponden

It is written : " At the end of an infinite search t philosopher finds himself clinging to laughter as the b of human fruit." Meredith is something to cling when running an African hospital in the bush.

A common Sunday afternoon patient is the pic with scalds of head and neck. As a gesture of self generosity (or maybe just atavism) they fall into pots boiling soup. The law heartlessly disallows any m piccin soup, so the chop-mammies pull them out bring them here. We used sulphonamide ointment w a nurse was found smearing on sulphur ointment ; si then we have preferred penicillin cream as less liable confusion.

The counter-irritant cuts made by the witch doc are sometimes remarkably effective. It would de the professors to see a patient complaining of p the loin, vomiting, fever, and headaches displayed be students with the precise surface markings of L.2 map out in neat juju scars.

Umbilical hernias are looked on as adornments rarely cause trouble. Indeed they are a valuable alte tive to the rectum for palpating deep in the pe through the thin burnished skin. On arrival my c was promptly christened Umbo and my steward Abdo for conspicuous anatomical reasons. They c not understand what I was laughing at when they t me that " quickly " was *tum-tum.*

* * *

The October meeting was over and the doctors, ha dined convivially in the verandah restaurant overlool the Avon, now sat in ordered composure to watch final rendering of the Tragedy of Hamlet. White he grey heads, and bald heads contemplated with n admiration the excellent and realistic production ; did Victorian whiskers and frock coats seem out of p in the court of the ignoble Claudius ; indeed, we come prepared for the New Look and an autom telephone on the royal desk, but these we were spa It was only right that we, as doctors, should pass ju ment on this appalling tragedy, for was not a do originally to blame for it ? Was it not the Patholo Royal at the court of Elsinore who tripped up on all-important autopsy ? Had he searched the Ki body meticulously for evidence of the presumed serpe bite ? Had he examined the external auditory mea with a hand lens ?

We tolerated the tiresome Polonius, the fickle Gertru and the platitudinous Horatio, in order to enjoy t philosophical gravedigger who so honourably uph Adam's profession. Each particular hair stood on e as the darkling officers of the guard watched the pal and aphonic ghost fade in the cheerless air of ea dawn : like them we were " distilled almost to jelly w the act of fear " as this emphysematous spectre pou out a whole packet of trouble for young Hamlet. As t tragedy unfolded and the news of Ophelia's death w told, our sympathies were with the miserable Prince Denmark. Two hours later, the compulsion neuro spent and the greed of Claudius rewarded, our sy pathies were entirely with the coroner for Elsinore. now, our pulses quickened by Robert Helpmann's fla display of athletic histrionism, we viewed a stage litter with corpses and sullen survivors.

On the homeward journey through the Warwicksh countryside we prepared depositions and pink certificat for our friend the coroner. The old King's amende certificate now reads : 1. (*a*) Intravascular clotting, d to (*b*) Instillation of cursed hebona into portals of ear verdict of Wilful murder (" most foul ") against Claudiu Polonius died of : 1. (*a*) Hæmopericardium, due t (*b*) Cardiac tamponade (sword-wound), due to (*c*) Eave dropping, with 2. Cerebral arteriosclerosis (he was a stupid old man) as a contributory cause ; verdict o Misadventure, "and in bringing in this verdict I shoul like to say that no blame whatever attaches to His Roya Highness, who was clearly under the impression tha *no-one* was hiding behind the curtain. (*Decent ch this coroner.*) At the same time I should like quantity; indeed, its rapid hydrolysis renders this impossible.

Thirdly, injection in the human of up to 80 mg. acetyl- intra-arterially has not been followed by thrombosis.[4] Wyburn-Mason does not give the authorities for his t that acetylcholine "accelerates" blood-clotting; and Vesselowsky [5] have shown that with high concen- such as 1/1000 to 1/50, clotting was actually slightly

and Stoner [4] found that the intra-arterial injection 0 mg. of acetylcholine in 2 ml. was followed in the ity of cases by "burning," "crushing pain," muscle , and a skin flush—very similar to that of other acci- drug injections—and, be it noted, despite 2% procaine erial infiltration. These effects were attributed to the carine" responses of the acetylcholine, but I am given derstand that the above solution has a pH of about 3·5 this may be the explanation. Pain and other effects were constant feature; as in other accidental drug injections, probably depended, as Wilson and Stoner observed, hether the solution was distributed to skin or muscle. obviously thrombosis has nothing to do with the pain.

Finally, Dr. Wyburn-Mason presents a case which loped the "signs of brachial neuritis" after thio- one injection, and comments: "it is difficult to ain as due to arterial damage." I quite agree. find it even more difficult to interpret as due to local tion around the brachial artery or major nerves. ve never known the brachial plexus to palsy itself sympathetic-gesture to one of its irritated branches. lar "shoulder-girdle syndrome" cases have been ibed following T.A.B. and other inoculations, and enough, after operations. Dr. Wyburn-Mason himself contributed to the subject; the condition been called "neuralgic amyotrophy" by Parsonage Turner.[6] They attribute the effects to brachial- s perineural œdema, and the complications of venous injections may be one of many mechanisms sible for this.

has been well said that an hypothesis, even if wrong, an honourable death if it has provoked thought discussion.

, W.1. SOL. M. COHEN.

RTION, STERILISATION, AND THE LAW

—The letter from Dr. Haire in your issue of 23 provides an opportunity for reference to the ation of abortion law during the trial of Dr. or Bergmann and Dr. Mary Bell Ferguson, who May were acquitted of criminal abortion after a days' hearing at the Old Bailey.

his summing-up the judge quoted the following s from the Bourne case (1938):

> "If the doctor is of opinion, on reasonable grounds and ith adequate knowledge, that the probable consequence of e continuance of the pregnancy will be to make the man a physical or mental wreck, the jury are quite ntitled to take the view that the doctor who, under those ircumstances and in that honest belief, operates, is operat- ng for the purpose of preserving the life of the mother."

And he added: "I fully adopt those words and invite you to bear them very much in mind."

ter on he told the jury:

> "You are not concerned with the question as to whether Dr. Ferguson arrived at the right conclusion; you have not to decide whether Dr. Ferguson did or did not make a mistake. Between medical people there may often be differences of opinion; sometimes it is difficult to assert which of two opinions is to be preferred, but you are not here to weigh up whether Dr. Ferguson was correct or ncorrect in the view that she had formed. You have to be satisfied by the prosecution that she expressed a dis- honest opinion, and that when she advised, if you think she did advise, the termination of pregnancy by her letters in these two cases, you will have to consider whether you are persuaded by the evidence called by the prosecution that that lady gave a dishonest opinion, did not act in good faith, and was therefore advising something that was unlawful."

After this remarkable legal pronouncement, does it not seem unlikely that, on the grounds described by Dr. Haire, a jury would convict a medical practitioner who had "in good faith" performed or advised the operation? And therefore the risk of imprisonment and loss of livelihood by doctors who show courage in relation to the practice of therapeutic abortion, would seem to be now considerably less than formerly.

ALICE JENKINS
Hon. Secretary,
Abortion Law Reform Association.

53, Gloucester Terrace,
London, W.2.

DENTURES AND ANÆSTHESIA

SIR,—Some of your correspondents seem to have difficulty in getting an airtight fit for the edentulous.

A thick piece of 'Gamgee' will mould to fill all except the most hollow cheeks. Clamping a face-piece on without any padding has been condemned in the past for producing nerve palsies; but rubber face-pieces can be moulded slightly in the hands to give a better fit. I have found stuffing the sides of a face-piece less effective and more easily dislodged than the more usual and simpler gamgee with a hole in it for the nose and mouth. As for packing round an air-way or tube, why increase the number of items which can be "left behind," except of course when a pack is essential as for a dental operation? The large masks suggested last week by Dr. Barnard increase the "dead space" in which carbon dioxide and other gases can collect in too large proportions.

Lastly, many of the old and toothless have small and shrunken faces.

Manchester. S. SHUBSACHS.

PROPRIETARY MEDICINES UNDER THE NATIONAL HEALTH SERVICE ACT

SIR,—It was, of course, to deal with such difficulties as borderline cases (which Dr. Forster says I omitted to consider) that I suggested an expert advisory committee to the Minister. I cannot quite see how Dr. Forster can state, as he did in his letter on Oct. 30, that "proprietary articles ordered on N.H.I. and private prescription were all of the truly ethical type," and yet fail to find anything significant in the fact that practitioners were effectively discouraged from prescribing such "truly ethical" preparations. (Average of proprietary medicines prescribed in the three areas quoted by me: private 31·5%, N.H.I. 6·2%.)

Dr. Forster's criticisms of the Chemists Federation would not, I think, have been made had he been better acquainted with its work over the past few years. (The federation, for example, has concerned itself little with price protection.) Following the adoption of a selective policy the standards committee have applied the federation's rules in respect of formulæ, conditions of manufacture and presentation, and claims made on labels and packings and in literature and advertisements. Preparations on the list before the adoption of standards have also been reviewed with the result that much unsound literature has been revised and certain products removed altogether from the list. This work has required the sacrifice of a great deal of time by the members of the standards committee, whose qualifications are pharmaceutical, scientific, and legal. Medical advice, including that of a permanent medical adviser, is readily taken. In addition, specialist medical opinion is sought whenever necessary.

I think it is important to remember that there are two related but distinct problems: (1) to establish the safety of "domestic" proprietaries for use by the public, and (2) to ensure that "ethical" proprietaries have sufficient merit to justify the State paying for them under the National Health Service. An almost complete solution to the first problem may be found in the further development of the work of the Chemists Federation, advertising associations, and other interested bodies, always provided that the services of the pharmacist are fully utilised.

The high standard of the information services provided by the great majority of the manufacturers of "ethical"

Wilson, A., Stoner, H. B. *Quart. J. Med.* 1947, 16, 237.
Harvey, A. M., Lilienthal, J. L. *Bull. Johns Hopk. Hosp.* 1941, 69, 566. Ellis, L. B., Weiss, S. *J. Pharmacol.* 1932, 4, 235.
Zunz, E., Vesselowsky, O. *Arch. int. Pharmacodyn.* 1938, 60, 116.
Parsonage, M. J., Turner, J. W. A. *Lancet*, 1948, i, 973.

can partners in such a group really do this? If they do not send patients to each other, especially to senior and surgical partners, they risk mutual acrimony and incur financial loss since all earnings are pooled.

A significant paragraph reads: "The success of this group has been built on complete freedom of action as a group, and on the much-discussed personal-profit motive. *How greatly it will be affected by restrictions* imposed on part-time consultants practising in groups where some members have G.P. contracts with local executive councils, remains to be seen. Any official attitude which prejudices the free action of the general-practitioner consultant is likely to be fatal to medical group practice." In this particular matter the duty of those responsible for the administration of the National Health Service would seem clear.

The criticisms above are not directed against general-practitioner partnerships, which are obviously desirable because of the advantages of covering duties during periods of leisure and holidays and the sharing of running expenses and practice facilities. Nor is it unreasonable for members of a G.P. partnership to develop, within limits, special bents and to seek higher qualifications. Like most worth-while things in life it is a matter of balance and where the line is drawn.

CONSULTANT.

TUDOR EDWARDS MEMORIAL

SIR,—In June, 1947, you were good enough to publish a letter inviting contributions to a fund for the establishment of a memorial to the late Mr. Arthur Tudor Edwards. The fund was closed on March 31 last and reached £4000, with which the Royal College of Surgeons of England and the Royal College of Physicians have consented to form and administer a trust to found a Tudor Edwards lectureship to be given alternately at the two colleges. It is hoped that the lectures will reflect Tudor Edwards's wide interests, and that they will embrace not only the surgery and medicine of diseases of the chest, but also the allied studies of anatomy, physiology, pathology, and anæsthetics applicable to thoracic surgery.

HORDER
Chairman.
COURTAULD-THOMSON
London, W.1. Treasurer.

SICKLING RAPIDLY DETECTED

SIR,—I have just noticed the statement in an annotation[1] that Singer and Robin[2] have introduced a new test for the presence of the sickle-cell trait.

I should like to point out that this test was introduced by me in 1945.[3]

G. ROBINSON
Medical Research Institute, Accra. Senior Pathologist.

LIFE AND DEATH IN A CONCENTRATION CAMP

SIR,—As my late husband's assistant and companion in Theresienstadt concentration camp may I be allowed to reply to Dr. Juraj Oravec's letter in your issue of Sept. 18?

At Theresienstadt the unboiled potatoes often eaten by the internees were usually already putrified for the most part, and were thus a probable cause of many cases of diarrhœa.

From my own experiences, I disagree with Dr. Oravec's opinion that "nocturia" and "polyuria" are not deficiency diseases, but the consequence of the consumption of considerable quantities of watery soups distributed to the internees as food. During the 2¹/₄ years of my internment I ate no soup and only consumed a moderate amount of liquids. Yet, like many of our comrades, I suffered from this very awkward inconvenience after a certain time during which other symptoms of deficiency had already appeared. Improvement only came after liberation. The same symptom was observed in Germany, especially in 1946–47. It was indeed alarming to see the water balance of many patients so seriously disturbed, some indeed being beyond medical help.

Munich. ELSE WOLFF-EISNER.

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1. *Lancet*, 1948, i, 874.
2. Singer, K., Robin, S. *J. Amer. med. Ass.* 1948, 136, 1021.
3. Robinson, G. *Trans. R. Soc. trop. Med. Hyg.* 1945, 39, 264.

ACCIDENTAL INTRA-ARTERIAL INJECTION DRUGS

SIR,—The theme of Dr. Wyburn-Mason's lette Oct. 2 is that in my article (Sept. 4 and 11) I h "confounded the effects of intraneural and in arterial injection"; that in fact such drug injec was into either the major nerves or the perivasc nerve network, and that the arterial thrombosis other circulatory effects could be adequately expla by such neurological damage. But his reasoning fla some important physiological facts, and it is my to confute him with some vigour.

1. Blood is not aspirated from major nerve or vascular tissues. Yet blood was aspirated, accordin the anæsthetists' reports, in most of the cases.

2. Patients do not fall asleep after injections into perivascular tissues or major nerves, as followed in t cases. Thiopentone may be a general anæsthetic, locally it is a profound irritant; much local p sloughing, or abscess formation are the well-kn effects of such spillage. Distal circulatory patho does *not* follow such *an* accident.

3. Massive limb œdema, blisters, punched sloug ulcers, as in some of the cases, Dr. Wyburn-Mason w have us believe are "familiar to neurologists" "*identical with . . . e.g., in brachial neuritis* causalgia" and the "initial effects of 'Proctoca injection." Such bizarre "neuritic" behaviour of have not, however, been observed by my neurolo friends or myself.

4. It is difficult to account for the complete palsy after such injection by any mechanism other ischæmia. Otherwise, it does mean the separate bloc of the radial, ulnar, and median nerves; even stiletto skill of a Borgia could not achieve that 4 ml. Anæsthetists have a reputation for kindly position to surgical retort and insult, but it is presu too much to suggest that in their search for the me cubital vein they injected the ulnar nerve.

I fail to understand why Dr. Wyburn-Mason i reluctant to accept the effects of ischæmia on n conduction; the uncurtained iron facts are on vie any *Index Medicus*. Nerve conduction is an a metabolic process requiring oxygen, and if blood be interrupted nerve conduction cannot continue.

5. Dr. Wyburn-Mason's concept of such ext gangrene as being of the class of "trophic le comparable to the tabetic ulcer and bedsore, require the imagination of a Salvador Dali. The of course, is that in 1936 the requiem for trophic was sung in the experimental laboratory by Gra and in the human by Lewis and Pickering.[2] T showed that changes ascribed in the past to the in ruption of "trophic" nerve-fibres are in reality second effects to the loss of movement or sensation.

6. The pale hand, the cyanosed fingers, the flus skin, the gangrene Dr. Wyburn-Mason explains ease as simply the effects of irritation of the va constrictor and vasodilator fibres; but we are told how such stimulation paralyses the sensory motor fibres at the same time.

To suggest peripheral vasodilatation as prima responsible for the limb death, implies a strange disordered behaviour of a multitude of physicians surgeons in their management of the ischæmic lim for such is their aim and endeavour.

7. According to Dr. Wyburn-Mason the intraneu injection of thiopentone "stimulates the vasodila fibres, liberates acetylcholine in the blood-vess" th and as "acetylcholine accelerates blood-clotting" t "initially precipitates thrombosis." This is of cou pure hypothesis unbrushed by the lightest touch of wings of fact.

Firstly, peripheral vasodilatation is believed to be du the inhibition of vasoconstrictor impulses; active va dilator fibres (if they exist in human skin), have a very limit functional significance.[3]

Secondly, there is no evidence that *acetylcholine*, even thus liberated, could find its way into the arterial stre

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1. Grant, R. T. *Clin. Sci.* 1936, 2, 1.
2. Lewis, T., Pickering, G. W. *Ibid*, p. 149.
3. Sarnoff, S. J., Simeone, F. A. *J. clin. Invest.* 1947, 26, 453.

in water as a draught statim, and instruct the med parent to make hot tea for herself and the ld. This revives the one and supplies further tannin the other. No untoward results have been brought my notice.

London, N.17. ALFRED JORDAN.

APPLICATION FOR HOSPITAL POST

—Let me hasten to assure your correspondent B." that he is perfectly correct in his letter last when he says: "It would seem that more tact consideration are applied in obtaining the services cook than those of a doctor": and let me add that more tact and consideration have to be applied in ing those services once they are obtained. This of course, only one aspect of the dismal situation g from the inexorable law of demand and supply; and maids are nowadays almost unobtainable, anything from 30 to 70 physicians and surgeons scrambling for every precious vacancy offered in respective specialty. When contemplating the pass-lists for the higher qualifications, one wonders this oversaturation of the market for specialists finally reach its logical conclusion, with holders of M.R.C.P. and F.R.C.S. scrubbing the floors and washing dishes, while the cook-generals and housemaids on house committee dictate the treatment of the tients.

hile on the subject of comparative values, let me by asking what we are to think of the generous s of the Spens reports while certain dentists in the S. are now earning money at the rate of £24.000 ?

PHYSICIAN.

DOSAGE OF SULPHETRONE

—The oral dose of 'Sulphetrone' to be aimed at which gives a blood-level of 7·5–10 mg. per 100 ml. Ewing indicates in his letter on Oct. 30, the oral which is finally administered varies considerably, usually 6–10 g. for adults, or 3–6 g. for children. idence of side-effects is reduced when the gradual of dosage suggested by Madigan is employed.

our view that should absorption be so faulty as sitate daily adult doses in excess of 12 g., or 's doses in excess of 6 g., recourse should be had parenteral route for at least a proportion of the It should be remembered that there is always a al reservoir of drug in the gut, unabsorbed, or eted by the ileum; normally this is lost to ption by passage into the cæcum. This picture is d with stasis, when sudden rises in blood-trations have been observed. It is clearly unwise crease unduly the concentration of drug in the gut, adult oral doses in excess of 10 g., or sometimes 2, daily are not to be recommended.

culosis Chemotherapy Unit,
Hospital, Farnborough, Kent. D. G. MADIGAN
come Research Laboratories,
Beckenham, Kent. GEORGE BROWNLEE.

PHARAOH FACIES

—Expressions such as "facies Hippocratica," oid facies," and "adenoid facies," not to mention sardonicus" and others, have long since received al sanction. I have been wondering how the expres-"Pharaoh facies" would be received if suggested an addition to the list. I believe it fully fits a very -defined clinical entity—the preliminary phase of all of deafness of sudden onset. Thus it is found ally in salicylate poisoning and cinchonism.

My first observation, made over ten years ago in a hospital atient department, was on a patient suffering from the er condition. She was a young girl presenting a picture complete indifference to any attempt at normal unication with her on the part of physician, nursing and orderlies—until finally a question was put to her writing.

is a typical history. During this preliminary she was really out of touch with the world around having had no time to familiarise herself with lip-reading, finger-spelling, and gesture. It was this attitude of almost supreme indifference to all that was going on that recalled to me those historical notes on that government administrator in Ancient Egypt, the Pharaoh who hearkened not to Moses, the founder of public health. I feel sure that anyone who has met deafness of sudden onset, in its early phase, will agree that this simile is quite appropriate.

Pharaoh facies is not seen in patients with deafness of gradual onset, who have had ample time to adapt themselves to changing conditions—for example, those with progressive labyrinthin· deafness or presbyacusis. I believe, however, that colleagues will agree that Pharaoh facies aptly describes the preliminary expression of the patient in noise deafness, concussion deafness, and shellshock deafness, before lip-reading or other devices have been learned, and occasionally in the deafness complicating epidemic cerebrospinal meningitis, measles, mumps, or typhoid fever, and the deafness found in certain forms of drug idiosyncrasy and poisoning, as described above.

London, W.1. S. HALES.

Parliament

Removal of a Mental Patient

IN the House of Commons on Nov. 1 Mr. E. McN. COOPER-KEY drew attention to an "unwarranted intrusion and abuse of power by public servants."

Mrs. Salter, he said, lived with her daughter, a mental deficient, in a basement flat in Hastings. On Oct. 8 Mrs. Salter went shopping, leaving her daughter alone in the flat suffering from gastric trouble. On her return she found two policemen and an official from the Ministry of Health had forced an entry. She ordered the men to leave. They informed her that the entry had been authorised by a high authority and she was asked for her keys. She refused again, and asked the men to leave. They then informed her that her daughter was to be removed to a mental hospital. A police surgeon arrived who produced a roughly drawn certificate to the effect that Mrs. Salter and her daughter were of unsound mind and should be removed to the local hospital. At the hospital Miss Salter was removed to a private room, a justice was summoned, and she was pronounced of unsound mind. At 7.30 P.M. Mrs. Salter was released and told that if she called next morning she would be able to see her daughter. But in fact, her daugher was removed an hour later to Hellingly Hospital.

Mr. Cooper-Key said that the local authorities sought to justify their action under section 14 (1) of the Lunacy Act as amended by the National Health Service Act.

This provided that if a duly authorised officer (*a*) had reasonable grounds for believing that a person was of unsound mind, and (*b*) was satisfied she was not under proper care, he should, not may, within 3 days give notice to a justice.

Mr. Cooper-Key did not complain of the provisions in paragraph (*a*) in this case, but was it seriously suggested that a devoted mother's attention and nursing was not proper care?

Under section 72 of the Lunacy Act, as amended by the National Health Service Act, any patient resident in an asylum should be discharged on application by the appropriate relative. On the following Tuesday Mrs. Salter accordingly went to the asylum and demanded the return of her daughter, who was at once discharged. There had been no question of course of this patient having either homicidal or suicidal tendencies. As the law stands, Mr. Cooper-Key pointed out, local authorities have the power to remove an individual against the wishes of her parent, but the asylum must release her immediately on application by the parent. He submitted this rendered nonsensical the administration of the Act.

Mr. JOHN EDWARDS, parliamentary secretary to the Ministry of Health, in reply, related how, in consequence of information received by the medical officer of health for Hastings, a duly authorised officer visited Mrs. Salter's flat.

He heard peculiar noises coming from a room, but got no response to knocks on the door. Looking through the proprietaries and the specialised knowledge of the doctor reduce the second problem to small dimensions, and there is certainly less reason in this country than in America for the setting up of such a body as the Council on Pharmacy and Chemistry. An advisory committee to the Minister, together with the existing machinery for dealing with excessive prescribing under the Act, would provide, in my view, all the means of control which are required.

Finally, may I suggest that those concerned with the solution of these problems should bear in mind that the vitality of the industry, the professional freedom of the doctor, and the public welfare are all involved, and that the use of "ethical" proprietaries under the National Health Service concerns the lifeblood of the *Pharmacopœia* itself.

London, N.W.10. E. W. Godding.

TESTING ANALGESICS

Sir,—It is interesting to note from their article on Oct. 30 that Dr. Hewer and Dr. Keele in testing analgesics have chosen the method of pain-induction by means of contraction of ischæmic muscles rather than cutaneous pain elicited by heat radiation as described by Hardy and others.

Workers who have used both methods have expressed decided preference for the latter. Thus Jones and Chapman[1] regard the "muscle ischæmia pain" method as less accurate and highly subjective. Similarly, Chapman, Arrowood, and Beecher,[2] in assessing on 15 subjects the analgesic effect of 20% nitrous oxide as equivalent to that of gr. $^1/_4$ of morphine sulphate, say:

> "Two types of pain production have been studied: (*a*) pain arising from heat radiation on the skin of the forehead. Our principal conclusions are based upon those observations. (*b*) Pain arising from muscle ischæmia as a result of exercise of the hand under conditions of vascular occlusion by a cuff tourniquet on the arm. Here, the observations are highly subjective and have been used only as supplementary support for our conclusions."

It seems that the problem of testing analgesics is a thorny one in view of their side-effects—notably that of euphoria. After administration of some drugs (particularly of the opiate group, pethidine, and 'Physeptone') the pain is still discernible but the attitude towards it is changed, inasmuch as the "alarm reaction" is reduced. Thus a question suggests itself: Are the analgesics as such really tested, and can the analgesic and euphoric effects be separated? This vexed question was the subject of a symposium in the U.S.A. in 1943.[3]

London Hospital, E.1. Bernard Kenton.

OVULATION AND THE MENSTRUAL CYCLE

Sir,—In his critical survey last week of the evidence concerning the time of ovulation within the menstrual cycle, based on the study of tubal ova, early embryos, and endometrial histology, Professor Davies describes a case in which ovulation appears to have occurred on the 9th or 10th day of a cycle in a woman whose history indicated regular cycles of normal length (28 days).

It is commonly assumed that if ovulation occurs unusually early in a cycle then that cycle will be an unusually short one; and conversely, if it occurs unusually late then the cycle will be unusually long. Davies criticises this assumption, and submits that there is no conclusive evidence that the duration of activity of the corpus luteum of menstruation is rigidly constant, and that estimations of the length of the postovulatory phase of the cycle based on the above methods are unsafe. The estimation of the time of onset of the next menses in all the cases quoted by Davies is, as stated by him, purely assumption since the cycles were interrupted, generally by hysterectomy.

It is obvious that the determination of the time of ovulation can be more satisfactorily made by some other means, such as the vaginal-smear technique. The results of many years' experience of this technique, using Pasini's stain, have indicated two facts[4]: first, that while it is common for ovulation to occur ab the middle of a cycle of 28 days, variations are freque and secondly, that in the successive cycles of any individual the time of ovulation is remarkably const and is even resumed with the same timing after p nancy. One case showed extreme variation from common condition in that ovulation was deduced to h occurred on the second day of the cycle—i.e., during bleeding phase. That this was so was substantia after a long period of apparent infertility, by pregna based on this information. The cycle length, w had been recorded for many years, was very reg with a duration of about 25 days. During the pe of investigation ovulation occurred regularly about days before the onset of the succeeding menses indicated that the functional life of the corpus lut was of this duration. This is a wide divergence from average of 14 days suggested by the investigators w reports are reviewed by Davies.

A more extended survey of menstrual cycles than yet made would seem to be necessary before deci what may be regarded as normal and as abnorma the time of ovulation within the cycle. At the mom as Davies indicates, there is no certain evidence justify the conclusion that the day of ovulation ca even approximately deduced from the time of succeeding menstrual period.

University of Sheffield. W. S. Bulloug

AN ALLEGED RACKET

Sir,—An ingenious journalist preparing his col for a Sunday paper some weeks ago thought up published a method by which, he said, the public c exchange a National Health Service prescription toilet preparations with an easy-going chemist. chemist would not dispense it, but would be paid by State as if he had. No-one can prove that such a t has never happened among the millions of prescript dispensed under the National Health Insurance Act, certainly I can call no case under that Act to mind du the last twenty years, and the ingenious journalist careful to give no specific instance under the Nati Health Service Act.

The matter might have rested there, as no more t a titbit for Sunday readers, had not one of your P patetic Correspondents given the fable the autho of your columns a week ago. Like the inge journalist, he gave no specific instance, for there instance for him to give, but he started the hare and the papers have taken it up, quoting The Lanc as authority. I trust that on looking at the paragra again you will agree that it is regrettable that t reflection on pharmacy should have been published, ev in lighter vein. It has already hit medicine as w One paper now alleges that some doctors "are handi out prescriptions regardlessly" as their part in t imaginary racket.

Pharmaceutical Society of Great
Britain, 17, Bloomsbury Square,
London, W.C.1.

Hugh N. Linstead
Secretary.

*** Our correspondent, being assured that the abu has happened, hoped that informal publicity might prev its ever happening again. Neither he nor we intend any reflection on a profession which sets and maintai an exemplary standard of conduct.—Ed. L.

DEADLY NIGHTSHADE POISONING

Sir,—As a pharmacist of over twenty years' exper ence, I followed the recent articles on this subject[1] wi keen interest.

The advice given seemed to be to empty the stomac and obtain medical attention. I was very surprise to find no mention of the general antidote to alkaloids— i.e., tannic acid. As, of course, is well known, th forms an insoluble tannate of the alkaloid, and absorptio is retarded.

During my professional life I have several times ha a distracted mother, a child under one arm and a botanical specimen in the other hand, rush into th pharmacy. I invariably give 10–15 grains of tanni

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1. Jones, C. M., Chapman, W. P. *Arch. intern. Med.* 1944, 73, 322.
2. Chapman, W. P., Arrowood, J. G., Beecher, H. K. *J. clin. Invest.* 1943, 22, 871.
3. Fed. Proc. 1943, 2, 187.
4. Bullough, W. S. *Brit. J. Obstet. Gynæc.* (in the press).

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1. *Lancet*, Sept. 11, pp. 423 and 438; *Ibid*, Sept. 25, p 513, *Ibid*, Oct. 2, p. 548.

ich will fall upon the taxpayer ?—Mr. BEVAN: It would very difficult administratively to provide the variety of tteries required in the private sets. It is much easier inistratively to provide the standardised batteries which provided with the Government aid.

Dental Treatment

ir WALDRON SMITHERS asked the Minister how many ple had applied for free dental treatment since the setting of the National Health Service.—Mr. BEVAN replied: ut $1^3/_4$ million.

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Medical Registration: the Foreign List

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Tuberculosis Treatment in Switzerland

r. ANTHONY GREENWOOD asked the Minister whether was aware that regional hospital boards were unable to for the treatment of tuberculous cases in Switzerland was previously the practice of some county and county- ugh councils before the National Health Service Act e into operation; and whether, in view of the deficiency eds in this country for the treatment of tuberculosis, he d make it possible for regional boards to provide treat- t abroad when desirable.—Mr. BEVAN replied: I have power to make it possible for regional boards to do this to authorise expenditure of this kind. Mr. GREENWOOD: der that it may not be possible to say that tuberculosis ents are worse off under the new scheme than previously, the right hon. gentleman consider the possibility of tion at a later stage ?—Mr. BEVAN: I cannot agree ey are worse off. I think that is a gross exaggeration. e are further forms of treatment that can be given in countries the remedy is not to send our people to other ries, but to make that form of treatment available here.

r. JOHN LEWIS: Will the Minister bear in mind that the atic conditions in Switzerland are regarded as a form of tment ?—Mr. BEVAN: That is a matter for medical ion and not for me.

Medical Examination of Food-handlers

r. CHARLES TAYLOR asked the Minister whether he would roduce legislation making it compulsory for handlers of d to be examined periodically to ascertain that they were t carriers of disease such as paratyphoid —Mr. BEVAN plied: I am afraid the very elaborate arrangements which uld be needed are at present impracticable, nor am I ised that the present state of our knowledge would justify em.

Infection from Train Lavatories

Mr. SOMERVILLE HASTINGS asked the Minister of Health ether his attention had been called to the danger of the semination of typhoid fever, infantile paralysis, and other eases, as the result of the lavatories of main-line trains charging directly on to the track: and what action he oposed to take.—Mr. BEVAN replied: I am advised that ere is hardly any evidence at present that disease is spread this way: but my medical officers are keeping in close uch with current research in this field.

“. . . The study of the individual patient as the principal ent of his disease is only just beginning to recover from its glect during the ascendancy of bacteriology. We are rly relearning that the assistance of natural recuperative wers is no less important than the development of specific eatments aimed at the ‘disease entity.’ No treatment can more specific than the resistance of the individual to his disease.”—Dr. IAN P. STEVENSON, *N.Y. St. J. Med.* 1948, 48, 2156.

Obituary

JOHN PERCIVAL HELLIWELL

C.B.E., M.R.C.S., L.D.S.

Major-General Helliwell, who was director of the Army Dental Service in 1935–36 and has since been consulting dental surgeon to the London County Council, died on Nov. 7 at the age of 64. Son of the late James Helliwell, of Manchester, he was educated at Owens College and at St. Mary's Hospital, London, where he qualified in dentistry in 1908. From 1910 to 1914 he worked in India as a civilian in dental charge of British troops, and in 1915 he received one of the first dental commissions in the Royal Army Medical Corps. He was soon promoted to be inspecting dental officer, and when the Army Dental Corps was established in 1921 he became inspector of dental services at the War Office. In 1935 he was promoted major-general and first director of the service which he had done so much to bring to birth. On retirement a task of almost equal magnitude awaited him as a whole-time member of the staff of the L.C.C., which was then expanding its hospital dental service and coördinating this with the school dental service. Both in military and civilian life he showed himself an able administrator, approachable, sincere, and keen-sighted. Outside his administrative work he became a principal exponent of a policy for the dental profession which may yet prevail. Regarding dentistry as essentially a branch of medicine, he at all times opposed the separation of the two professions; he believed that if possible dental surgeons should have a basic medical qualification, and he testified to his belief by taking the M.R.C.S. in 1926 when he had already spent several years at the War Office. His reservations to the final report of the Teviot Committee in 1946 pointed out that “the one great aim of the dental surgeon should be the preservation of the natural teeth and their associated tissues and to prevent as far as possible the need for artificial dentures”; yet it was from dentures that he made his greatest profit. In Helliwell's view the provision of dentures should be entirely in the hands of trained technicians; the dental surgeon should be able to derive an adequate income from the conservative work which is his proper task; and the present large deficiencies in the dental care of the people should be reduced by delegating much of the simpler preventive and surgical work—e.g.. in school and other priority services—to dental ancillaries.

General Helliwell married in 1914. Mrs. Helliwell survives him, with a son and a daughter.

ALFRED WOLFF-EISNER

M.D. TÜBINGEN

Dr. Wolff-Eisner, professor extraordinary at Berlin and later at Munich, died on March 29.

Born in 1877 in Berlin, he followed his medical studies there and at the universities of Kiel and Tübingen where he took his doctorate with highest honours in 1901. As a student he had already published work on the cutis, and in 1902 he became an assistant to Richard Pfeiffer at the Institute of Hygiene at Königsberg. Pfeiffer remained a lasting influence in his life and thought. He returned to Berlin to become director of the bacteriological department at Friederichshain Hospital, a post which he held till 1913. Promotion came to him but slowly, and it was not till 1926 that he received a professorship in Berlin University and was put at the head of his own laboratory at the Charité. He was also sub-chief of the Robert Koch Institute. It was characteristic of him that he refused a full professorship offered on condition that he “changed” his Jewish religious ties. In 1933, under the Nazi racial laws, he was removed even from the appointments he held, and in 1943 he was sent to the concentration camp at Theresienstadt. His account of the deficiency diseases observed there was reviewed in our issue of Aug. 7 (p. 228), and a letter from his widow, who shared his imprisonment, appears in our present issue. On his release he settled in Munich, where, besides his university appointment, he became medical director of the Schwabinger Hospital for Displaced Persons and director of window he saw Miss Salter behaving like an imbecile. The official arranged with the police surgeon, the police, and the St. John Ambulance Brigade to meet him at the house, over two hours after his first visit. While preparations were being made for Miss Salter's removal Mrs. Salter returned home. She refused to open the door and became violently hysterical. The senior partner of the police surgeon on his arrival gave the certificate, on which the officer acted, that mother and daughter were of unsound mind.

The original action taken by the officer, Mr. Edwards explained, was under section 20 of the 1890 Act as amended by the 1946 Act which provides that an officer may remove, without warrant, a person of alleged unsound mind to a hospital for 3 days pending proceedings. When Miss Salter arrived at St. Helen's Hospital she was in a dirty condition and thin to the point of emaciation. She could only walk with a little support and had to be assisted with her feeding. Later in the evening Mrs. Salter and her daughter were seen by a justice of the peace and the partner of the police surgeon who did not consider Mrs. Salter then to be certifiable. She was allowed to leave the hospital, but the justice signed the order for Miss Salter, who was removed to Hellingly Mental Hospital. The medical superintendent certified that Miss Salter was suffering from chronic schizophrenic dementia, but he had no alternative but to allow her to leave the hospital in conformity with a direction given by her mother under section 72 of the 1890 Act, as he was unable to certify that she was both dangerous and unfit to be at large.

As to the forcible entry into the flat, Mr. Edwards pointed out that the authorised officer had a statutory responsibility to discharge and he would have been negligent if he had not tried to do something about it. He (Mr. Edwards) had also been asked about legal changes necessary to get rid of the inconsistencies in the administration of the Act, but he would not be in order to go into that matter.

Gifts to Hospitals

In the House of Lords on Nov. 2 Lord SALTOUN asked whether the removal of hospital collecting-boxes from railway stations was not contrary to the Government's expressed wish that private subscriptions to hospitals should continue.

Lord SHEPHERD, in reply, said that the Minister of Health and the Secretary of State for Scotland hoped and were confident that private generosity, which had done so much for the hospital service in the past, would not now come to an end. But they did not consider it proper that the new governing bodies of hospitals, which were public bodies financed from public funds and were no longer dependent upon private charity, should themselves appeal for funds. Appeals made by independent voluntary organisations on behalf of the hospital service, or of particular hospitals, for money to provide extras and amenities outside the ordinary running of the service, were, of course, a wholly different matter.

More Fats and Sugar

Mr. JOHN STRACHEY, Minister of Food, announced in the House of Commons on Nov. 2 that the weekly domestic ration of cooking fat would be increased from 1 oz. to 2 oz. from Dec. 5 to March 26, 1949, and of sugar from 8 oz. to 10 oz. from Dec. 5. The sweet ration would be 1 lb. for each four-week period from the same date. The rationing of jam and marmalade would end on Dec. 5.

QUESTION TIME

Cost of National Health and Insurance Services

Sir WALDRON SMITHERS asked the Chancellor of the Exchequer if he would state in terms of pence per £ in income-tax what was the cost to the taxpayer of the National Health Service and the National Insurance scheme, respectively.—Sir STAFFORD CRIPPS replied: The National Health Service and the National Insurance schemes will have been in force for the last nine months of the current financial year. It is estimated that during this period the cost to the taxpayer of the former will be equivalent to an income-tax of about 1s. 0½d., and that the contributions of the Exchequer to the latter will be equivalent to one of about 8½d.

Health Service Registrations

Replying to a question, Mr. ANEURIN BEVAN stated t 18,105 general practitioners, 8343 dentists, and 93·1% the population had joined the National Health Service.

Basic Salary

Mr. JOHN RANKIN asked the Minister why it had t decided that new entrants to the general practice of medi were not to receive the basic salary as of right.—Mr. BE replied: To meet the wishes of the medical profes themselves.

Mr. SOMERVILLE HASTINGS asked the Minister in how m cases applications for basic salary had been received executive councils in England and Wales; and in how m cases this had been granted.—Mr. BEVAN replied: Pr figures are not available but I understand that more 1000 applications have been granted. Mr. HASTINGS: the Minister give any idea of the proportion of the applicat which have been granted?—Mr. BEVAN: I cannot giv details at the moment. This is primarily a matter for executive councils. Unless appeals are made at this I would not have the information.

Dr. S. SEGAL: Does not the Minister agree that the atte on the part of the medical profession to impose a m test upon doctors who apply for a basic salary is reall effort to defeat the whole object of a basic salary?— BEVAN: It would be undesirable for me to make a comm upon the representations of the medical profession. I deal with the representatives of the profession. If doc have individual complaints they ought to make them to their profession, so that I may hear them through profession.

Medical Supplies

Sir ERNEST GRAHAM-LITTLE asked the Minister whe he was aware that under the National Health Se (Scotland) Act, 1947, medical practitioners are permitte obtain without restriction medical supplies for their pers use in their practices upon presentation of their own pres tions; that under the National Health Service (Engl Act, 1946, medical practitioners are for this purpose gra only 2s. 6d. per annum per 100 patients; and whether in public interest he would make the same concession to Eng practitioners as is made to Scottish practitione Mr. BEVAN replied: I see no reason to alter the arrangem which, incidentally, was in force before, under the National Health Insurance scheme.

Local Hospital Committees

Mr. DOUGLAS MARSHALL asked the Minister whether was aware that the press is not now admitted to meeti of the local hospital committees west of Bristol or in Cornw and, in view of the fact that these local hospital commit were provided so that they would form a liaison with public, he would take action to remedy this grievance Mr. BEVAN replied: The function of hospital managem committees is the day-to-day control and managemen their hospitals; and while I hope they will take o opportunity of keeping the closest contact with public opin the admission of the press to their meetings is a matter their own decision.

Hearing-aids

Lieut.-Commander CLARK HUTCHISON asked the Mini whether, in view of the fact that the standard Medr hearing-aid supplied under the National Health Se does not suit all deaf persons, he would allow such pe a grant to assist them to purchase alternative equipment m suited to their individual needs.—Mr. BEVAN replied: answer is, "No, Sir." Lieut.-Commander HUTCHIS Does not the Minister appreciate that the same typ aid does not necessarily suit every person who suffers f deafness, and will he give further consideration to this matt —Mr. BEVAN: Further investigation is proceeding as to proportion of deaf people who cannot be properly fitted the instrument which we are supplying. At the mom that percentage is unknown, and until further investiga has taken place we think it would be very unwise to ext the facilities.

Mr. A. C. M. SPEARMAN: Does not the Minister think if free batteries are allowed to holders of Government and not to owners of commercial types, it is a direct encour ment to the latter to throw away their aids and unnecess require Government aids, thereby increasing the expendi ich will fall upon the taxpayer ?—Mr. Bevan: It would very difficult administratively to provide the variety of tteries required in the private sets. It is much easier ministratively to provide the standardised batteries which provided with the Government aid.

Dental Treatment

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Born in 1877 in Berlin, he followed his medical studies there and at the universities of Kiel and Tübingen where he took his doctorate with highest honours in 1901. As a student he had already published work on the cutis, and in 1902 he became an assistant to Richard Pfeiffer at the Institute of Hygiene at Königsberg. Pfeiffer remained a lasting influence in his life and thought. He returned to Berlin to become director of the bacteriological department at Friederichshain Hospital, a post which he held till 1913. Promotion came to him but slowly, and it was not till 1926 that he received a professorship in Berlin University and was put at the head of his own laboratory at the Charité. He was also sub-chief of the Robert Koch Institute. It was characteristic of him that he refused a full professorship offered on condition that he “changed” his Jewish religious ties. In 1933, under the Nazi racial laws, he was removed even from the appointments he held, and in 1943 he was sent to the concentration camp at Theresienstadt. His account of the deficiency diseases observed there was reviewed in our issue of Aug. 7 (p. 228), and a letter from his widow, who shared his imprisonment, appears in our present issue. On his release he settled in Munich, where, besides his university appointment, he became medical director of the Schwabinger Hospital for Displaced Persons and director of window he saw Miss Salter behaving like an imbecile. The official arranged with the police surgeon, the police, and the St. John Ambulance Brigade to meet him at the house, over two hours after his first visit. While preparations were being made for Miss Salter's removal Mrs. Salter returned home. She refused to open the door and became violently hysterical. The senior partner of the police surgeon on his arrival gave the certificate, on which the officer acted, that mother and daughter were of unsound mind.

The original action taken by the officer, Mr. Edwards explained, was under section 20 of the 1890 Act as amended by the 1946 Act which provides that an officer may remove, without warrant, a person of alleged unsound mind to a hospital for 3 days pending proceedings. When Miss Salter arrived at St. Helen's Hospital she was in a dirty condition and thin to the point of emaciation. She could only walk with a little support and had to be assisted with her feeding. Later in the evening Mrs. Salter and her daughter were seen by a justice of the peace and the partner of the police surgeon who did not consider Mrs. Salter then to be certifiable. She was allowed to leave the hospital, but the justice signed the order for Miss Salter, who was removed to Hellingly Mental Hospital. The medical superintendent certified that Miss Salter was suffering from chronic schizophrenic dementia, but he had no alternative but to allow her to leave the hospital in conformity with a direction given by her mother under section 72 of the 1890 Act, as he was unable to certify that she was both dangerous and unfit to be at large.

As to the forcible entry into the flat, Mr. Edwards pointed out that the authorised officer had a statutory responsibility to discharge and he would have been negligent if he had not tried to do something about it. He (Mr. Edwards) had also been asked about legal changes necessary to get rid of the inconsistencies in the administration of the Act, but he would not be in order to go into that matter.

Gifts to Hospitals

In the House of Lords on Nov. 2 Lord SALTOUN asked whether the removal of hospital collecting-boxes from railway stations was not contrary to the Government's expressed wish that private subscriptions to hospitals should continue.

Lord SHEPHERD, in reply, said that the Minister of Health and the Secretary of State for Scotland hoped and were confident that private generosity, which had done so much for the hospital service in the past, would not now come to an end. But they did not consider it proper that the new governing bodies of hospitals, which were public bodies financed from public funds and were no longer dependent upon private charity, should themselves appeal for funds. Appeals made by independent voluntary organisations on behalf of the hospital service, or of particular hospitals, for money to provide extras and amenities outside the ordinary running of the service, were, of course, a wholly different matter.

More Fats and Sugar

Mr. JOHN STRACHEY, Minister of Food, announced in the House of Commons on Nov. 2 that the weekly domestic ration of cooking fat would be increased from 1 oz. to 2 oz. from Dec. 5 to March 26, 1949, and of sugar from 8 oz. to 10 oz. from Dec. 5. The sweet ration would be 1 lb. for each four-week period from the same date. The rationing of jam and marmalade would end on Dec. 5.

QUESTION TIME

Cost of National Health and Insurance Services

Sir WALDRON SMITHERS asked the Chancellor of the Exchequer if he would state in terms of pence per £ in income-tax what was the cost to the taxpayer of the National Health Service and the National Insurance scheme, respectively.—Sir STAFFORD CRIPPS replied: The National Health Service and the National Insurance schemes will have been in force for the last nine months of the current financial year. It is estimated that during this period the cost to the taxpayer of the former will be equivalent to an income-tax of about 1*s.* 0½*d.*, and that the contributions of the Exchequer to the latter will be equivalent to one of about 8½*d.*

Health Service Registrations

Replying to a question, Mr. ANEURIN BEVAN stated 18,165 general practitioners, 8343 dentists, and 93 1% the population had joined the National Health Service.

Basic Salary

Mr. JOHN RANKIN asked the Minister why it had decided that new entrants to the general practice of medi were not to receive the basic salary as of right.—Mr. B replied: To meet the wishes of the medical profes themselves.

Mr. SOMERVILLE HASTINGS asked the Minister in how m cases applications for basic salary had been received executive councils in England and Wales; and in how m cases this had been granted.—Mr. BEVAN replied: Pr figures are not available but I understand that more 1000 applications have been granted. Mr. HASTINGS: the Minister give any idea of the proportion of the applicat which have been granted?—Mr. BEVAN: I cannot give details at the moment. This is primarily a matter for executive councils. Unless appeals are made at this I would not have the information.

Dr. S. SEGAL: Does not the Minister agree that the atte on the part of the medical profession to impose a m test upon doctors who apply for a basic salary is reall effort to defeat the whole object of a basic salary?— BEVAN: It would be undesirable for me to make a com upon the representations of the medical profession. I deal with the representatives of the profession. If do have individual complaints they ought to make them to their profession, so that I may hear them through profession.

Medical Supplies

Sir ERNEST GRAHAM-LITTLE asked the Minister whe he was aware that under the National Health Se (Scotland) Act, 1947, medical practitioners are permitte obtain without restriction medical supplies for their per use in their practices upon presentation of their own pres tions; that under the National Health Service (Engl Act, 1946, medical practitioners are for this purpose gra only 2*s.* 6*d.* per annum per 100 patients; and whether in public interest he would make the same concession to En practitioners as is made to Scottish practitione Mr. BEVAN replied: I see no reason to alter the arrangem which, incidentally, was in force before, under the National Health Insurance scheme.

Local Hospital Committees

Mr. DOUGLAS MARSHALL asked the Minister whethe was aware that the press is not now admitted to meet of the local hospital committees west of Bristol or in Cornw and, in view of the fact that these local hospital commit were provided so that they would form a liaison with public, he would take action to remedy this grievanc Mr. BEVAN replied: The function of hospital managem committees is the day-to-day control and management their hospitals; and while I hope they will take ev opportunity of keeping the closest contact with public opini the admission of the press to their meetings is a matter their own decision.

Hearing-aids

Lieut.-Commander CLARK HUTCHISON asked the Minis whether, in view of the fact that the standard Medre hearing-aid supplied under the National Health Serv does not suit all deaf persons, he would allow such perso a grant to assist them to purchase alternative equipment m suited to their individual needs.—Mr. BEVAN replied: T answer is, "No, Sir." Lieut.-Commander HUTCHISO Does not the Minister appreciate that the same type aid does not necessarily suit every person who suffers fro deafness, and will he give further consideration to this matter —Mr. BEVAN: Further investigation is proceeding as to t proportion of deaf people who cannot be properly fitted wi the instrument which we are supplying. At the momen that percentage is unknown, and until further investigatio has taken place we think it would be very unwise to exten the facilities.

Mr. A. C. M. SPEARMAN: Does not the Minister think th if free batteries are allowed to holders of Government aid and not to owners of commercial types, it is a direct encourage ment to the latter to throw away their aids and unnecessarily require Government aids, thereby increasing the expenditur

Notes and News

AID TO HOSPITAL ADMINISTRATORS

For some time past King Edward's Hospital Fund for lon has afforded information and advice to voluntary itals and other organisations interested in hospital work. h the aim of coördinating and extending this service Fund has established a division of hospital facilities h comprises an information bureau, an advisory service, rary of hospital books, journals, and plans, and an index ospital literature. The director of the division, which n work last Monday, is Captain J. E. Stone, to whom quiries should be directed at the fund's offices, 10, Old y, London, E.C.2.

PARPANIT

our last issue Dr. Dunham and Dr. Edwards recorded l at the *National Hospital, Queen Square*, of '*Parpanit*,' thetic antispasmodic with atropine-like activity, first ibed two years ago in Switzerland. From Italy, V. Davini A Borellini[1] report using it in 10 cases of extrapyramidal ramidal lesions, where the dose was gradually increased maximum of 0·2 g. daily. In those patients who were ly receiving atropine, the dose of atropine was gradually ed to find out at what dosage symptoms began to ear; at this point parpanit was given in increasing whilst the doses of atropine were still being reduced. g to supply difficulties, long courses of parpanit were possible; but these workers claim that their results m the report of Grünthal and of Hartmann in Switzerland, parpanit goes a long way to restore normal movement kinsonian spasm, but that it gives much less benefit her forms of spasm, tics, and chorea. Untoward effects noted in two cases: one patient had slight palpitations giddiness; the other was so upset that he refused to ue the treatment. The drug seemed to begin to take 15-30 days after the start of the course, probably to the time taken to reach the effective dose. Two s said that their limbs felt strangely light, as if made ter or immersed in water; and that they were unable l exactly where the end of a limb was. They also that their muscles were not so easily tired and that movement was made much easier.

REGIONAL ORTHOPÆDICS

e effective the orthopædic service should be linked other services in the region and with the doctors and als of the neighbourhood. In a brochure prepared for Central Council for the Care of Cripples, Mr. G. R. stone, F.R.C.S., has reviewed the possible arrangement e service on lines which will allow for early discovery rompt treatment of cases, education of crippled children, aftercare and vocational training. He points out that rge region there may be several orthopædic organisations, serving a district of manageable size, and all coördinated the regional hospital board. Arrangements for "cold" pædics, he thinks, must differ from those made for cases ute disease of bone and joint. "Cold" orthopædics—things as locomotor disorders and deformities correctable xercise—can be managed, he finds, by staff centred in main hospital and working through a radiating service of s. Acute cases and compound fractures, however, must n the care of the orthopædic and accident staff of the n, working not only in the central orthopædic hospital in the general hospitals of outlying towns. At each of hospitals a surgeon should be appointed to take charge the unit with the help of adequate resident staff—a strar and a house-surgeon. These surgeons should not k in isolation but should be visited regularly by a senior ber of the central hospital staff on clinic days, and should nd clinical conferences at the central hospital once or e a week. If a large region offers special difficulties, this association may not be possible; but at least frequent ical conferences and an agreed system of records should arranged.

ome members of the regional orthopædic team will work y in the central hospital; others, including surgeons d orthopædic physiotherapists—better called "aftercare ers"—will work partly at the centre and partly outlying hospitals and clinics. But the team embraces re than surgeons and sisters: it includes all who are working in the wards, theatres, workshops, and special departments of the hospital. The clinics will best be housed in local hospitals, or, failing that, in any quarters which give adequate space and equipment for removal and application of plasters, examination of patients on the couch, and study of gaits and movement. The local clinic is specially important for the diagnosis of chronic and insidious disorders, since a mother will often consent to bring her child there when she would hesitate to take him, perhaps some distance, to the central hospital. Physiotherapy at the clinics takes the form of simple remedial exercises; more elaborate physiotherapy must be undertaken at the central hospital, where such things as warm swimming-baths and other modern equipment must be provided. This hospital should be placed, if possible, in or near a university town with a teaching hospital. The senior staff in the orthopædic and accident units will also be on the staff of the orthopædic hospital. Most of their out-patient work will then come to the teaching hospital, while the orthopædic hospital will be almost entirely inpatient. Hospital workshops will enable the orthopædic hospital to supply all the splints, boots, and appliances needed in the region, and will also offer training and employment for some disabled boys and men. Vocational guidance and training during treatment can be so effective, he finds, that the vast majority of patients can go into full employment at normal rates of pay in skilled trades, even though they are badly disabled.

Mr. Girdlestone ends his little treatise with a plan for an orthopædic hospital and some practical notes on its equipment. All he says is telling and instructive, but some will feel the heart of his message is concerned with other things than buildings and tools: "This care," he says, "is indeed needed day by day, or week by week, and often year after year. . . . Only explanation and the maintenance of an obvious and lively interest by surgeon and aftercare sister all through active treatment, and far into the final stages of convalescence, can assure success. . . ."

LOUDSPEAKER UNDER THE PILLOW

A NEW small extension loudspeaker suitable for placing under the pillow has been introduced by Messrs. Philips Electrical Ltd., under the name 'Pillotone.' This comprises a bimorph crystal drive unit mounted flexibly in a plastic case, about 4 in. in diameter and 1 in. thick at the centre. The advantages claimed for such a unit are that it provides more comfortable listening than earphones, and, unlike the ordinary loudspeaker, does not impose noise on those who do not wish to listen.

University of Cambridge

On Oct. 30 the following degrees were conferred:

M.D.—R. A. D. Crawford,* J. N. Milnes, J. S. Heller, P. D. Samman.

* By proxy

University of Aberdeen

On Oct. 27 the degree of M.D. was conferred on H. McL. Raffan.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Nov. 2, with Dr. W. *D. D.* Small, the president, in the chair, the following were elected to the fellowship:—

G. A. H. Gumley (Dunfermline), S. Thiambiah (Vepery, Madras), Ernest Bulmer (Birmingham), J. D. Ross (Kingskettle), A. W. Branwood (Edinburgh), H. J. S. Matthew (Edinburgh).

The diploma of membership was conferred upon the following:—

L. M. Comissiong, E. G. L. Mark, G. A. Rall, T. G. Wilson, H. C. Falcke, Israel Kessel, W. R. Lang, C. C. Foote, Solly Lopis, W. A. B. Campbell, J. W. Nelson, M. S. Fraser, A. F. J. Maloney, E. N. Moyes, Joan E. Spicer, J. D. T. Steele, J. C. Mehta, A. T. Macqueen, W. N. M. Lyon, P. B. Fox, J. S. Robson, Mary K. MacDonald, J. A. Loraine, Wickramaratchyge A. Karunaratne.

The Hill Pattison-Struthers bursary in clinical medicine was awarded to Dr. David Bull.

Royal Faculty of Physicians and Surgeons of Glasgow

At the annual meeting of the faculty on Nov. 1, the following office-bearers were elected: president, Dr. W. R. Snodgrass; visitor, Mr. W. W. Galbraith; treasurer, Mr. Matthew White; librarian, Dr. A. L. Goodall; representative on the General Medical Council, Mr. Andrew Allison; other councillors, Dr. Stanley Alstead, Dr. Thomas Anderson; Dr. G. B. Fleming, Dr. J. Gibson Graham, Dr. D. McKay Hart, Mr. A. B. Kerr, Mr. T. Murray Newton, Dr. E. G. Oastler, Dr. Charles Read, Mr. G. H. Stevenson, and Dr. G. M. Wishart.

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[1] *Minerva med.* 1948, 39, 432.

the serological laboratory of the university clinic for nervous diseases. The state of his health prevented his accepting appointments offered to him in Venezuela and Bolivia.

Wolff-Eisner regarded it as his life's work to prove that Pfeiffer's discoveries on lytic immunity and the endotoxins apply not only to typhus and cholera but also to many other diseases in men and animals—especially tuberculosis. His *Handbuch der experimentellen Serumtherapie* was published in 1910. He was the friend of Ehrlich and Calmette, and his relationship with the latter was unclouded by their rival claims for priority in the discovery of the cutaneous and conjunctival reaction for tuberculosis.

In the memorial printed at his death a colleague stresses as his outstanding quality—" seine unbestechliche Wahrheitsliebe, ein absolutes Gefühl für Recht, das ihn zwang, überall dort in die Schranken zu treten, wo er glaubte dass Recht bebeugt würde, auch wenn er sich . . . selbst sehr oft damit geschadet hat."

Public Health

Insurance against Industrial Diseases

EARLY last year a committee was set up by Mr. James Griffiths, Minister of National Insurance, with instructions to advise on the principles which should govern the selection of diseases insurable under the National Insurance (Industrial Injuries) Act, 1946. In its report[1] the committee expresses the opinion that the tests which the Samuel Committee of 1906 recommended for application before a disease was scheduled are no longer appropriate. The present committee recognises that for a disease to be selected for insurance, particular cases must normally be attributable with reasonable certainty to the nature of employment. Subject to this overriding test, the primary consideration should be whether the disease is specific to an occupation, or, if not specific, whether the occupation causes special exposure to risk of the disease; incidence alone is not a conclusive test of risk. A condition which can be treated as an accidental injury should not be selected for insurance as a disease, unless it can be more suitably dealt with in this way. The committee also recommends the appointment of a small standing committee to investigate proposals for adding to the list of selected diseases, to review periodically the existing list, and to suggest subjects for research.

Diphtheria in Scotland

The capacity of inoculation to protect against diphtheria and to reduce fatality is well known. There is, however, less evidence of the difference in the characteristics of the illness in the inoculated and the uninoculated; and in Scotland a subcommittee of the Department of Health's scientific advisory committee has undertaken an investigation[2] to fill the gap.

The subcommittee, under the chairmanship of Prof. J. W. McNee, investigated the records of 4272 of the 9340 cases admitted to hospital in 1942. Of these 4272 cases 58·5 % were in females, and over the age of 15 almost 75 % were in females—a finding attributed to this sex's greater attachment to the home and closer contact with children.

Of the 3187 cases in which the type of organism was recorded 2219 (69·6 %) were of the gravis type. Altogether 1746 (40·9 %) of the patients developed some complication; and the incidence of toxic complications was appreciably higher in patients under the age of 10. The over-all fatality-rate was 2·97 %—a low rate in view of the preponderance of gravis infections. Over half the deaths were in patients with circulatory complications. In uncomplicated cases the fatality-rate was 0·75 %. With tonsillar diphtheria gravis infection was six times more fatal than intermedius and mitis, whereas with pharyngeal and multiple sites gravis infecti was only twice as fatal.

Counting all the 1023 with a history of inoculation " inoculated," the fatality-rate in the inoculated 0·68 %, while in the uninoculated it was 3·69 %. W regard to the incidence of complications, the inoculat fared little better than the uninoculated. Of all inocula cases, 2·16 % developed nervous complications, 7· circulatory complications, and 0·3 % a combination these two; for the uninoculated the comparable figu are 4·05 %, 4·8 %, and 0·77 %. However, in inocula patients there were significantly fewer toxic compli tions than in the uninoculated of the same age-grou In the inoculated who developed nervous complicati there were no deaths, while in the inoculated w circulatory complications the fatality-rate was 0·4 for the uninoculated the fatality-rates were respecti 5·26 % and 27·88 %. Compared with the uninoculat the inoculated had a significantly higher proportion gravis infection (suggesting a less solid immunity t against intermedius and mitis). They also had significantly higher proportion of tonsillar infections significantly less pharyngeal and multiple infecti On admission toxæmia was significantly less.

Poliomyelitis in British Zone of Germany

The peak of the poliomyelitis outbreak in the Bri zone of Germany was reached between Sept. 18 and with 267 cases and 34 deaths. Totals for the montl September were 937 cases and 67 deaths. A Bri film on early diagnosis and treatment, completed ea this year, has been shown, " dubbed " in German, be large medical audiences in Berlin and Hamburg.

Notification of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended Oct				
	2	9	16	23	
Cerebrospinal fever .. .	28	31	36	31	
Diphtheria	114	112	141	153	
Dysentery	58	84	114	99	
Encephalitis lethargica ..	1	1	1	1	
Measles, excluding rubella ..	3546	4061	4536	5303	62
Ophthalmia neonatorum ..	65	63	55	53	
Paratyphoid fever	6	13	9	4	
Pneumonia, primary or influenzal	402	421	479	426	4
Polioencephalitis	5	7	7	4	
Poliomyelitis	83	79	81	76	
Puerperal pyrexia	97	111	100	115	11
Scarlet fever	1234	1273	1519	1389	13
Smallpox	..	..	..	..	
Typhoid fever	40	18	12	13	
Whooping-cough	2204	2073	1949	2163	20

" . . . In qualifying the measures of child care as most arbitrary, I refer to the fact that only a very few of the measures, outside the *actual chemical composition* of the fo of children, are actually based on the welfare of the infan They are instituted for all sorts of extraneous reasons facilitating a normal social life for the mother by rigid adhe ence to a feeding schedule; making matters easier for th nursing personnel in the obstetrical hospitals by advisin against nursing *and for bottle-feeding* infants; segregatin newborn infants in a separate room without contact wit their mothers, for the purpose of making the control o infections easier; and many others. The strangeness o these measures will strike you immediately if you try t apply them to the grownup."—Dr. RENÉ A. SPITZ, *Medical in the Postwar World*. New York and London, 1948; p. 38.

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1. Ministry of National Insurance: Report of the Committee on Industrial Diseases. Cmd. 7557. H.M. Stationery Office. 4*d*.
2. Department of Health for Scotland. Diphtheria: Report by the Infectious Diseases Subcommittee of the Scientific Advisory Committee. H.M. Stationery Office. Pp. 31. 6*d*.

PARENTHOOD AND SOCIAL CHANGE*

RICHARD M. TITMUSS

I

It is precisely one hundred and fifty years since Malthus published the first edition of his *Essay on the Principle of Population.*[1] There was nothing particularly original in his hypothesis concerning the relationship of people to food resources; his most important argument, as he took pains to state, had already been advanced in part by Hume and Adam Smith and by other writers in the past. His place in history is due not to originality, but to the fact that he was the first to elaborate and document the argument, and the first to have any real influence on public opinion.

Malthus addressed himself to philosophers like Godwin and Condorcet who believed that poverty and disease were eradicable nuisances. He did so in an age—not dissimilar after all from the present century—when the mind of Europe was heavy with a sense of wrong, when custom, with its magic that takes the sting out of injustice, was in retreat, and when the future of mankind appeared to depend on (in Malthus's words) "that stupendous phenomenon the French revolution, which, like a blazing comet, seems destined either to inspire with fresh life and vigour, or to scorch up and destroy the shrinking inhabitants of the earth."

Malthus, in 1798, saw one great obstacle to an improvement in the condition of society. Beginning with two simple postulates, which he came to regard as immutable laws, "that food is necessary to the existence of man," and "that the passion between the sexes is necessary, and will remain nearly in its present state," he arrived at the following thesis: that population is necessarily limited by the means of subsistence, that population always increases when the means of subsistence increase unless it is prevented by such checks as famine, war, plague, or moral restraint. In short the theory was that the fecundity of humanity was sufficient, if unchecked, at least to double the population every twenty-five years, and that an increase in food-supplies could not possibly keep pace with such an increase in the number of people to be fed.

This pessimistic doctrine, and the fears of economists like Ricardo who had been profoundly moved by the [illegible] menace of overpopulation and famine, were not borne out in the Western world. The first reply to Malthus came in dramatic fashion. In 1825 Parliament passed a Bill enabling locomotives to be used on the Stockton and Darlington railway, and two years later the first steamboat crossed the Atlantic. The development of steam transport by land and sea opened up the granaries of the New World, and allowed the means of subsistence to increase much more rapidly than the increase of population in Britain. Yet the rate of population growth was phenomenal; in England and Wales numbers doubled between 1801 and 1851 from 9 to 18 million—despite the filth, the cholera, and the "low and grovelling mode of living" which accompanied the unrestricted growth of an industrial society.

Godwin had pointed out that the answer to the problem of more food lay in calling in the resources of the new world. "Three-fourths of the habitable globe are now uncultivated. The parts already cultivated are capable of immeasurable improvement."[3] Malthus [illegible] these possibilities, and rejected the idea that Godwin's "beautiful system of equality" could be sustained from the products of the plains of the new world. He refused to believe because he did not wish to believe. He was intent on controverting the idea that social justice was either possible or desirable, and he was successful in proving his case to the satisfaction of the great majority of the governing and middle classes. His teaching fell upon willing pupils: it was delivered at a receptive moment in history: it was the response to the challenge of the new philosophies.

Fifty years later it was not the answer to the revolutionary ferment of 1848. The idea that human fecundity would outrun food-supplies had withered away. But, in England at least, it long exercised a powerful influence on economic and political thought. From this doctrine the inference was drawn that charity and social services were futile, tending only to increase the numbers of destitute by increasing births and postponing deaths. One practical effect of the diffusion of this belief was to assist the movement for repressive administration of the poor-law, and to prepare the way for one of the harshest Acts ever placed on the statute-book—the Poor Law Amendment Act of 1834. This Act, which inaugurated the famous doctrine of less eligibility, a theory that throughout the 19th and into the 20th century controlled the approach of English Government to the relief of destitution, "announced to the World," said Disraeli, "that in England poverty is now a crime."[4] It did more than that, according to a Conservative candidate at Bradford who denounced it as a Bill which "separates those whom God had joined together."[5]

In applying a penal discipline, the new poor-law broke up the family, assigning its members to different parts of institutions, it separated husbands from their wives and mothers from their children, and implicitly condemned procreation. Although it was vigorously attacked by John Walter of the *Times*, by Thomas Wakley of the *Lancet*, and by a large body of opinion in the country, the influence of Malthus was dominant and the Bill became law. If poverty was a personal and public crime, then the failure to save was likewise evidence of wrong. As children increasingly became a financial burden instead of a financial advantage, it was only a short step from this precept to the realisation that smaller families were not only socially respectable but were the means of avoiding poverty.

This is only a fragment of the story of the fate of the family under the impact of the industrial system; a system which led in the course of time to the disappearance of the family as the main unit of economic production, to a transformation in the protective and educative functions of the family, and, ultimately, to the liberation of marriage from the authority of childbearing. The Malthusian doctrines cannot be held responsible for these changes; many social, economic, and psychological forces were combining in the 19th century to elevate the individual and modify the characteristics of parenthood. The reasons for the emergence of the small-family habit have to be sought in the nature of the civilisation and culture which accompanied the growth of modern industrial society. But these doctrines did shape the form and they did influence the administration of the first, and in longevity the greatest, of England's social services for the relief of distress. Therein lies their particular relevance to the argument of this paper, for we see that the first intellectual approach in Britain to the problems of population policy had consequences which were detrimental to the family. Basically, these consequences sprang from a fear of overpopulation; from too many, rather than too few, births.

II

The past hundred years have witnessed a profound change in the problems affecting parenthood and family

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* Being the Lloyd Roberts lecture for 1948 delivered at Manchester on Oct. 28.

Guild of St. Luke, SS. Cosmas and Damian

The following officers have been elected for the forthcoming year: Master, Dr. W. B J. Pemberton; secretary, Dr. W. J. O'Donovan; treasurer, Dr. Patrick Corridan.

University College, London

On Wednesdays, Dec. 1 and 8, at 5.15 P.M., in the physiology theatre of the college, Gower Street, W.C.1, Dr. J. W. Trevan, F.R.S., will lecture on Statistics from the Standpoint of a Pharmacologist.

Ling Physical Education Association

The association is holding a conference from Dec. 29 to Jan. 1 at Chelsea Polytechnic, Manresa Road, London, S.W.3, on health education in schools. The speakers will include Dr. Dora Cadman, Dr. J. L. Dunlop, Dr. Robert Sutherland, and Dr. Marjorie Wilson.

Empire Rheumatism Council

A weekend course will be held by the council at the Apothecaries' Hall, Black Friars Lane, London, E.C.4, on Nov. 26, 27, and 28. Further particulars may be had from the secretary of the council, Tavistock House (N), Tavistock Square, W.C.1.

Owing to unforeseen circumstances Dr. Pedro Belou will be unable to give his lectures at the Royal College of Surgeons on Nov. 12 and 17 and at the Royal Society of Medicine on Nov. 15.

Mr. J. Burke Ewing, surgeon to the Wigan Infirmary, has been appointed professor of clinical surgery at Ottawa University and surgeon-in-chief to the Ottawa General Hospital. Mr. Ewing is a graduate of Queen's University, Ontario.

Flight-Lieutenant Alexander Mather, M.B., R.A.F.V.R., has been appointed M.B.E. for distinguished service in Palestine.

The insignia of the fourth class of the Brilliant Star of Zanzibar has been conferred by the Sultan on Dr. C. E. Roberts, O.B.E., specialist officer in the health department of Zanzibar.

Appointments

ABELES, F. M., M.D. Frankfurt, F.F.R., D.M.R.: radiologist, West Middlesex Hospital, Isleworth.
BIRNIE, C. R., M.D. Lond., M.R.C.P., D.P.M.: physician superintendent, St. Bernard's Hospital, Southall, Middlesex.
CARSON, M. B., M.B. Lond.: surgical registrar, M.R.C. burns unit, Birmingham Accident Hospital and Rehabilitation Centre.
EDWARDS, T. A. W., B.A., M.B. Camb., M.R.C.P.: physician, Clare Hall Hospital, South Mimms, Herts.
LESSLIE, JANE, M.A., M.B. St. And., D.P.H.: senior asst. M.O., maternity and child welfare, Wolverhampton.
PARKIN, THOMAS, M.B. Edin., M.R.C.P.E.: registrar, department of dermatology, Royal Sheffield Infirmary and Hospital.
SWINNEY, JOHN, M.C. Durh., F.R.C.S.: surgeon i.c. urological department, Newcastle General Hospital.

Births, Marriages, and Deaths

BIRTHS

BELL.—On Oct. 30, at Claygate, the wife of Mr. A. O. Bell, F.R.C.S.—a son.
BENNETT.—On Oct. 29, the wife of Dr. N. O. Bennett—a daughter.
DORNHORST.—On Nov. 3, the wife of Dr. A. C. Dornhorst—a daughter.
HARLAND.—On Nov. 3, at Kachhwa, India, to Dr. Grace Harland, the wife of the Rev. R. P. Harland—a son.
HUMPHREY.—On Oct. 31, the wife of Dr. Leslie Humphrey—a daughter.
KAULA.—On Oct. 27, the wife of Dr. Charles Kaula—a son.
LASK.—On Nov. 3, at Ascot, the wife of Dr. J. P. Lask—a daughter.
PATON.—On Nov. 2, in London, the wife of Dr. Ian Paton—a son.
ROSE.—On Nov. 5, at Bushey Heath, to Dr. Muriel Rose, the wife of Mr. Frederic Campbell Rose—a son.
SMITH.—On Oct. 31, at Wiggington, near Banbury, the wife of Dr. T. H. S. Smith—a son.
STEPHENS.—On Nov. 3, in London, the wife of Dr. F. D. Stephens, D.S.O.—a daughter.
TAYLOR.—On Oct. 30, at Woking, the wife of Mr. Lionel Taylor, F.R.C.S.—a daughter.

MARRIAGES

BARLAS—COUTANCHE.—On Oct. 30, at Hildenborough, Kent, John Alexander Barlas, M.B., to Pamela Honor Coutanche.
CAHILL—SHERRY.—On Oct. 9, at Esh Laude, Durham, John Cahill, M.R.C.S., to Kathleen Sherry.
PILCHER—SMEDLEY.—On Oct. 30, at Crich, Derbyshire, Richard Pilcher, M.C., M.R.C.S., to Elizabeth Margaret Smedley.

DEATHS

HEALEY.—On Nov. 4, at Lower Hellesdon, Norwich, Frederick Henry Healey, M.D., B.SC. Birm., D.P.M.
HELLIWELL.—On Nov. 7, John Percival Helliwell, C.B.E., M.R.C.S., L.D.S. R.C.S., major-general, retd. aged 61.

Diary of the Week

NOV. 14 TO 20

Monday, 15th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Prof. Robert Platt: Ætiology and Surgical Treatme Hypertension. (Part I.)
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. A. Schweitzer: Reflex Control of Blood-pre and Heart-rate.
5 P.M. Dr. B. D. Pullinger: Cell Multiplication in Adult Tis
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Q Anne Street, W.1
NOON. Prof. A. M. Claye: Use of Analgesic Drugs in Labo
5. P.M. Mr. H. H. Evers: Postmenopausal Hæmorrhage.
HUNTERIAN SOCIETY
8.30 P.M. (Apothecaries' Hall, Black Friars Lane, E Dr. W. J. O'Donovan, Miss Arnot Robertson, Dr. Ch Hill, Miss Bronwen Lloyd-Williams: That the Pr of Instructing the Layman in the Nature and Treat of Disease is being Carried to Excess.

Tuesday, 16th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Professor Platt: Ætiology and Surgical Treatme Hypertension. (Part II.)
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Schweitzer: Measurement of Cardiac Outpu Factors Influencing It.
5 P.M. Dr. Pullinger: Cell Multiplication in Adult Tissues.
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
NOON. Prof. H. J. D. Smythe: Induction of Labour.
5 P.M. Dr. E. Rohan Williams: X-ray Pelvimetry.
UNIVERSITY OF LONDON
5 P.M. (Westminster Medical School, Horseferry Road, S. Dr. Charles Swan: Rubella in Pregnancy as an logical Factor in Congenital Malformations and Still
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.

Wednesday, 17th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. D. H. Brinton: Intracranial Aneurysm. (Part
ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. Geoffrey Keynes: Portraiture of William H
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
NOON. Prof. R. A. Lennie: *Obstetric Operations in Di* Labour.
5 P.M. Dr. J. E. Morison: Establishment of Extra-u Respiration.
HARVEIAN SOCIETY OF LONDON
8.15 P.M. (26, Portland Place, W.1.) Prof. Ian Aird: Va a Tumour Clinic in a General Hospital.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. C. W. McKenny: X-ray Technique.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Po Place, W.1
Dr. P. G. H. Gell: Food and Resistance to Disease.

Thursday, 18th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. Robert Coope: Tuberculous Enlargement of In thoracic Lymph-nodes, and its Aftermath. (Mitch
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. Henry Barcroft: Blood-flow in the Limbs.
5 P.M. Dr. C. Keith Simpson: Blunt Head Injury.
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
NOON. Mr. J. E. Stacey: *Obstetrical Damage and Repair.*
5 P.M. Mr. S. G. Clayton: Endometriosis.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
5 P.M. Mr. J. Johnston Abraham: Victorian Doctor.
HONYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh Royal Infirmary.) Prof. W. C. Wil Blood-volume in Surgical Disorders.
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Dr. F. Gardner: Angiocardiography as an Ai Diagnosis of Cardiac Abnormalities. Dr. J. M. We Wells: Cardiac Anatomy as Demonstrated by An cardiography.

Friday, 19th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. E. B. Strauss: Affective Psychoses, includ Cyclophrenia.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Barcroft: Blood-flow in the Limbs.
5 P.M. Dr. Keith Simpson: Death from Vagal Inhibition.
ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
NOON. Dr. A. G. Wrigley: Dysmenorrhœa.
5 P.M. Dr. A. W. Spain: Symphysiotomy.
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's I Road, W.C.1
4.30 P.M. Mr. Walter Howarth: The End of an Era.
FACULTY OF RADIOLOGISTS
2.15 P.M. *Diagnosis Section.* (Royal College of Surgeon Dr. T. H. Hills: Angiocardiography in Congenital He Disease.
BRITISH TUBERCULOSIS ASSOCIATION
3.30 P.M. (Royal Empire Society, Northumberland Aven W.C.2.) Dr. Percy Stocks: Tuberculosis—Some Statisti Problems. Prof. B. W. Windeyer: Radio-sensiti Thoracic Tumours.
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. *Dr. J. R. B. Hern*: Asthma.
ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh
8 P.M. Sir Francis Fraser: Medicine in the New Social Order

of over four years, with so many social and economic blems which were not envisaged when they were born. Throughout this period of fifteen years, during which birth-rate theoretically constituted an important cial question, the status of the family did not ove. The accent in social policy did not shift in [illegible]. In the hierarchy of values displayed by ty parenthood continued to give place in choice esteem to other goals, other pursuits, and alternative es of living.

ne of these generalisations must now be supported facts and figures. I wish, in particular, to direct tion to certain economic matters which illustrate broad trend of public opinion and policy during the decade or so. Although these examples relate to ial standards their real importance lies in the light throw on contemporary attitudes to the family.

III

t, there is the central fact that the industrial n of reward for labour, which pays no regard to ly responsibilities, continues to command approval. tedly, during the inter-war years, one after another l survey, in York, in Bristol, in Birmingham, and ny other cities, was forced to draw attention to sequences of this system. Children were shown the primary cause of poverty, and few families, st income levels, escaped relative degrees of hard- n some shape or form. In any economic group, vel of living of a family is seen in relation to other es in the same group, and equality is lost when en are born. For most people, the level of living is more dependent on size of family than on income. troduction of family allowances for all but the child has done something to alleviate this disability. so, has the great extension in the provision of milk meals at school. It needs to be remembered, , that the child allowance has not the value when the demand for 5s. a week developed years ago. In terms of the price level of the is doubtful whether the allowance is, today, much more than about 2s. a week, less income-tax. nificant that all the pressure for more money the last few years to meet the rising cost of living entrated exclusively on wage-rates and salary . It is tacitly assumed that the controversy children and poverty is at an end; the gesture en made, the 5s. granted.

widespread and unquestioned is this assumption judged by the reception given to the Government's of policy in 1945 concerning the pay and allowances cers and men of the Armed Forces. All the tax-llowances and special grants for children and other ants which, by 1945, had reached standards lly appropriate to a wide diversity of family stances in comparison with those ruling in 1939, swept away.† In their stead, the industrial n of reward was adopted. "The Government," said, "regard the present system as unsatisfactory at the resulting family allowances, particularly case of large families, constitutes an unduly large tion of the emoluments of the married man, by arison with the pay of the batchelor." "The new gement will avoid the present disparities between married man and another of the same rank."[11] udy of the results of the change in pay suggests all Servicemen (officers and other ranks) with two more children experienced a reduction in income allowance is made for the improvements in basic , and the addition of the allowance of 5s. a week cond and subsequent children. Those who gained, and gained substantially in comparison with their fellows, were bachelors and married men without children. Childlessness was rewarded, and disapproval was shown to those with more than two children. The system now works as an economic device for discouraging parenthood among the fit.

There may well be strong reasons for adjusting Service pay to industrial conditions; it is so much simpler to ignore the family, the complications of dependency, the immense variety of circumstances, the economic crises which beset most families on the occasion of birth, illness, and death. The primary object, however, of this incursion into the question of Service pay is to make certain observations on the theme of parenthood. While on the one hand, we still shower respect on the family, with, as Alva Myrdal has said, "a whole system of verbal generalities, taboos and moralities,"[10] we continue, on the other hand, to act as though it was not in need of constant reinforcement. The anthropologists tell us that "the persistence of customs depends upon their rewarding value."[3] They are neither self-perpetuating nor self-destroying; they are not arbitrarily accepted or rejected; rather, they are habits strengthened by social rewards or weakened by a lack of them. What, in fact, is remarkable about this particular story of Service pay is the entire absence of public protest about a policy detrimental to family life.

IV

A second example of the trend of public policy in running against the interests of the family relates to the problem of income-tax and the cost of living. The Oxford Institute of Statistics recently estimated that the weekly cost of Seebohm Rowntree's "human needs" diet for a family of five persons was 83% higher in March, 1948, than at the end of 1936.‡ For families on a less austere standard the increase is probably greater. Nevertheless, it must be noted that the income-tax allowances for a child (£60) and for a married couple (£180) are precisely the same today as they were before the war. On the other hand, the allowance for a single person has risen from £100 to £110. Greater disparities in the incidence of taxation between those with and without children have been created by the rise in the allowance on the earned income of married women. The maximum has grown from £45 in 1938 to £110 in 1948 plus reduced rate relief.

The effect of these changes can be shown quite simply. On a total earned income of £500 a year, the married man with a wife at home and two children now pays £22 in tax, or nearly as much as the childless married couple who are both working, whose tax (if the wife earns £3 a week) is £25. If we take instead an income of £1000, the man with a wife and two children pays £180 against £184 for the childless couple who are both working. And if the wife earns £8 a week instead of £3 the tax falls to £145. The man with £1000 a year and three children is now paying £30 more tax than before the war, whereas the working couple without any children are paying less. This man with a wife and three children to keep pays only £112 a year less tax than the single man or woman earning the same amount. These four dependants are thus allowed only about 11s. a week a head, or in terms of pre-war purchasing power about 6s.

These illustrations relate, of course, to middle-class families. The economic struggle today of those below the taxable line to maintain two or more children on an income of less than £7 a week must be very hard. The estimated rise since before 1939 of about 80% in

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1939 the allowances for children of men in the ranks ranged to 4s. a week; by the end of the war the allowance 12s. 6d. a week, tax-free, for each child.

‡ See *Bulletin* of the Institute, May, 1948. This broadly agrees with the estimate by Prof. R. G. D. Allen that the price rise for food, clothing, rent, fuel and light, and other items was about 60–65% for the period 1938 to mid-1947. *Bulletin* of the London and Cambridge Economic Service, 1947, no. 111.

life. Children are no longer the inevitable accompaniment to marriage. This check to population growth—a check which has banished a vast amount of distress and which represents one of the major blessings of the 20th century—has followed from the collective decisions of men and women to limit the size of their families. Stimulated by neo-Malthusian propaganda, aided and abetted by an emulative culture born of economic individualism, strengthened by the emancipation of women from the 19th century authority of men, and impelled by the growth of a new sense of values in which the material has been dominant, the practice of birth control has found favour among an increasing number of married couples. This voluntary process, this apparently rational act based on a host of often irrational hopes and fears, has led for seventy years in one direction only—in the direction of smaller families. Between the 1870s and the outbreak of war in 1939 the birth-rate for England and Wales fell by nearly 60%. The average number of children born to married women which, in the 19th century, was over five, with many mothers bearing ten or more, had fallen by the 1930s to about two.

In 1923 the net reproduction-rate—an index which shows the number of potentially fertile women who, in the succeeding generation, will replace a woman now passing through the fertile period—fell for England and Wales below the point necessary for replacing the population. It continued to be insufficient for twenty-three years until 1946, the first year to gather in the post-war babies of the second world war. Expressed more simply the change appears more striking. Thus, $4^1/_4$ million women aged fifteen to forty-five in the 1850s produced more babies each year than 10 million women of similar age during the 1930s. This has had far-reaching effects on living standards, for it is probably true to say that the rise in the approved cost of living for children at most income levels has been much greater than that for adults and higher still than the rise in real wages. Nevertheless, these are effects which from time to time we forget. When we congratulate medicine, ourselves, and the Government on the good health of our children during the recent war, we do well to remember that the country had 2 million fewer of them (a number larger than the total child population of Australia) to feed, clothe, and house in 1939 than in 1914. Had this not been so we might all have been desperately short of milk.

Three observations can be made about this change in the reproductive habits of the British people. First, the strength and consistency of the trend towards the smaller family, regardless of prosperity or slump, war or peace, and seemingly unaffected throughout this period by the rise of the modern social service State. Secondly, the speed at which this revolution in attitudes to childbearing has been accomplished. Thirdly—and what is important to the theme of this paper—the fact that these changes have taken place without producing any demand insistent enough to influence social policy in favour of counter-measures. Nothing resembling in power the effects of the Malthusian doctrine in moulding opinion and legislative action can be discerned among all the forces which have determined social values and guided national policies during the last seventy years. On the contrary, in many respects the social environment, reflecting and informing the conscious and unconscious motives that underlie thought and behaviour, has become increasingly inimical to the family. We may well ask why the fear of too many people is so much more powerful than the fear of the consequences of a population declining in numbers, ageing in composition, and disinclined to replace itself.

Many decades passed before much notice was taken in this country of the possible effects of a declining birth-rate. And when they did begin to attract discu the essential problems of family life were obscured other issues. An insular preoccupation with questi of the different birth-rates of different social grou their levels of intelligence, and their inherited qualit came naturally to a country with a strong caste syst steeped in traditional values and accustomed to asse social merit by social position. This preoccupat confused the problem. It did so by suggesting t assistance to the family—for instance in the form child allowances—would encourage the breeding of unfit. No such concern about the differential birth- arose in Australia, New Zealand, the United State in Sweden and other countries faced with similar quest of a declining birth-rate.

Attention was thus diverted in this country from the fundamental problems to associated, subsidiary, questions about the reproductive habit social worth of two relatively small groups in soc Concern about the 10% at rest at the foot of the temporary scale of economic and cultural values —by contrast—about the 10% poised at the top, tracted attention from the 80% who determine future of the birth-rate and the quality of family In this controversy, at all events, the ends have domin the mean.

Other events during the past thirty years likewise prevented us from thinking clearly and as the right questions. We have continually shifted gaze at the bidding of recurring national crises. first signs of concern about the birth-rate during 191 which arose as a result of war losses and a man-p shortage, soon evaporated in the immediate post years. Some half a million extra babies in tw three years were sufficient to make many people t that they had been mistaken about the population tr They led the late Lord Keynes, for instance, to sug in 1922 that the devil of Malthus had once again unchained, and they contributed to the plannin grandiose schemes for moving millions of British p to the Dominions.

These schemes soon foundered on the rocks of ployment and economic depression. The Austral whatever they may think now, only wanted immig when trade was good and not when it was bad. as unemployment rose and the depression deepene became increasingly unrealistic in Britain to talk a too few babies. Such talk did not make sense to man in the street when the allowance for the child of the unemployed was less than 2*d.* a day.

The population question certainly attracted m attention from economists and social scientists dur the 1930s than at any time since the beginning of 19th century. Nevertheless the debate made li impression on the public mind. The individual— contrast to the family—continued to dominate the val and the morality of the period. The social problem this period, the problem of mass unemployment, seen as a problem of the economically disposses individual, and not as a crisis in the lives of famili And with the growth of autocracy in Europe, all c troversy centred round two governing poles of inter —the State and the individual. For these and oth reasons, many deeply rooted in the history of politi philosophies, the trade unions and the Labour Par in Britain took no interest in the problems of populatio The demand for child allowances, led by independe radicals like Eleanor Rathbone, increasingly acquir the character of a plea for the relief of distress.

It was against this background that a Royal Con mission on Population was unexpectedly appointed b the Coalition Government in 1944. Few Royal Com missions can have come to life with so little publi stimulus, and few can have found themselves, after th the number of fourth and subsequent births in fell by 18%.[12] I believe that the report the Royal Commission on Population will record a diminution in family size—particularly among class families—for the whole of Britain.

population question for this country today is not deciding whether it would be better to have a larger smaller population. We can rule out the possibility future of expanding numbers. The choice lies a population of about the present size, not too weighted with old people, or (in the words of the Commission) "the ultimate threat of a gradual out of the British people."[13] Sir John Orr has of the problem of world food resources and population continually growing in size. This can be of no service to the world, and particularly Eastern world, by allowing its population to enter of decline, by growing steadily older, and by less equipped for productive work. A few million people in Britain will not solve the world food, but such a change could confront us with social and economic consequences. We should be less able and less willing to make our contribution work of international coöperation. Nor will it anyone to move a substantial section of our young to Australia or elsewhere. We cannot solve the of not enough food by shifting people about, or by approving a process whereby the family disintegrates for want of encouragement and the grows steadily older in years and in mental

the situation of the British people today is not to that which confronted Malthus one hundred years ago. The wheels of a revolutionary which began to affect the institution of the in the 19th century are still turning.

now time that we recognised in our social policies the family is not what it used to be. Although maller in size, its responsibilities and its anxieties ater. "We now expect," said Margaret Mead. to achieve alone what no society has ever an individual family to accomplish unaided."[8] upon it to be responsible for the personality ment of children; for their socialisation and ation. We expect their nutritional needs to be it is no longer sufficient to simply provide them enough food. We expect the working of their and their bodies to be understood today to a extent than at any time in the past. And we all this from an inexperienced family which has lost or has been deprived of the support and formerly bestowed by custom, by religion, community life.

medicine, and in education too, the trend of today is looking away from egocentricity and sociality: towards considering the individual social being; to thinking of him as a member family, a group, living in a particular environment, working in a particular setting. It is in this way the family, still happily a tough institution, can helped to discharge its heavy responsibilities. We that this attitude should penetrate and inform social policy. Already we have a part of the frame- to hand. If the National Health Service, the ation Act, and the housing programme are con- guided, administered, and inspired by this sophy, family life will be strengthened, providing this is the core of the matter—there are no mental contradictions in social policy as a whole. attempted to show in this paper that the area of diction and conflict stretches over much of our social economic policy, not because we do not care about family but because we do not think about the family.

References at foot of next column

CLINICAL ASSESSMENT OF PERIPHERAL NERVE INJURIES

TINEL'S TEST

W. R. HENDERSON
M.B. Edin., F.R.C.S.
NEUROLOGICAL SURGEON, GENERAL INFIRMARY, LEEDS

THIS paper is concerned with two aspects of diagnosis in peripheral nerve injuries: (1) the value of Tinel's test, when it is interpreted according to his original description, which differs from present-day usage, in helping to decide whether to resect established lesions; and (2) the simplicity of routine quick exclusion of damage to nerve-trunks at any time after injury. It is based upon experiences in treating over 400 nerve injuries in prisoner-of-war hospitals in Germany during 1940–45. About 60 nerve sutures were performed. In some hospitals operations could not be done, for reasons outside British control, until after two years, and sometimes not at all; but in others there was no such hindrance. This enforced delay afforded an opportunity of studying all degrees of spontaneous recovery and of correlating it, and the appearance of the lesion at operation, with Tinel's test, the value of which was first appreciated in cases operated on at a late stage. Histological examinations could not be made. Detailed observations cannot be given, because the notes were lost in Germany.

Tinel's Test

After a nerve injury each axon that was damaged sufficiently to break its continuity degenerates distally, whether or not its individual sheath (endoneurium) was also broken. Axons sustaining milder trauma, without being broken, do not degenerate, though there may be temporary loss of function which, however, recovers quickly and completely within a few days or weeks (neurapraxia). The distal segments of broken axons undergo Wallerian degeneration, whereas the proximal ends regenerate and may re-establish peripheral connexions after a few months. This outgrowing of the proximal ends begins after a latent interval of perhaps two or three weeks, and those fibrils which are inside endoneural sheaths advance along the nerve at a rate of about 3 in. a month, whereas others that cannot find distal sheaths remain coiled up inside the neuroma.

The first few inches of the advancing young sensory axons are unmyelinated and sensitive to mechanical stimulation. Hence their position along the nerve can be detected clinically by percussion, which produces a tingling sensation referred to the cutaneous distribution of the nerve (and not to the region percussed). This tingling response disappears in a few months after the fibres, in the process of maturation, have become covered and insulated with myelin. This fact has long been used for demonstrating the presence of growing fibres and their rate of advance, either after suture or during spontaneous recovery, and it formed the basis of Tinel's

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MR. TITMUSS: REFERENCES

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4. Godwin, W., quoted by Malthus (op. cit., p. 180).
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their cost of living may indeed understate the real change, for these families can no longer buy the cheap alternatives, the secondhand clothes, and the cut-price articles. Rationing, by standardising price and quality and by largely abolishing the cheaper substitutes, has in one sense worked against those who have need to count every penny every week.

Does it not seem, in face of all this, that the causes of inflation in recent years—of too much money pursuing too few goods—have been misunderstood? Is it not possible that the demands for luxury and semi-luxury goods and services—for holidays, abroad, for beer, cigarettes, cinema seats, wireless sets, and so on—have largely come, at all income levels, from single people and married couples without children or without dependent children? If this is so, and if the different circumstances of those with and without dependent children have not been appreciated because the economists have forgotten the family, then it follows that measures taken to counter inflation will penalise parenthood at all income levels, and will not effectively remove purchasing power. Food *subsidies, said the Economist without distinguishing* between these differently placed groups, "are the main source of the colossal sums spent by working people on beer and tobacco."[2]

V

The situation today can now be more easily misunderstood because of the introduction in June, 1947, of a new cost-of-living index based on expenditure by an "average" working-class family or household containing only one child under 14 years of age.[8] This index was constructed on the Ministry of Labour's cost-of-living inquiry in 1937–38 relating to average expenditure by a family of $3^3/_4$ persons of whom $1^3/_4$ earned wage or salary. It was an elderly family, and one which, in *biological terms, was not replacing itself. It was a* family which, out of its weekly expenditure of £4 6s. 3d. spent not much more than one-third on food. Nearly as much was spent on tobacco, drink, entertainment, newspapers, household equipment, and other miscellaneous items. The whole budget reflected adult patterns of spending and social habits.

This new index, now to govern many plans and policies on economic matters, wage and price levels, replaced an index modelled on working-class budgets collected in 1904.[1] In most respects this index was out of date, but it had the grace and reality to give prominence to the costs of children. It related to an average family of 5·6 persons, of whom 3·6 were under fourteen years old.

The sociologist will observe that while the first inquiry approached the problem of the cost of living in terms of the family, the second, although using scientific method such as random sampling and taking advice from expert economists and statisticians, was based on the concept of the average household—a concept which has not been defined and is largely an economic abstraction. This change, adopted, it seems, without conscious thought, is of fundamental importance.

The detail of these indices differs in the following ways. Of total expenditure, the old index gave a proportionate weight of 72% to food and clothing. The new index gives only 44%. Children's clothing and footwear accounts for only one-fifth of all clothing expenditure in the new index. It is astonishing to find that the "average" working-class family of today is expected to spend more on its weekly butter ration of 3 oz. a head than on children's clothing and footwear, and twice as much on wines and spirits (excluding beer) as on children's shoes. This is, indeed, a remarkable British working-class family.

In terms of economic policy, the inference to be drawn from all this is reasonably clear. Price controls, for example, can be removed, and the cost of childre clothing and footwear can soar to unparalleled heigh but the nation's cost-of-living index will remain unmov and insensitive. Similarly, changes in the cost of f will now have much less effect on the index than forme Conversely, increases or decreases in the price of b cigarettes, cinema seats, and other miscellaneous ite will now exert a powerful influence. If food subsi were cut, and simultaneously the tax on beer or cigare was appropriately reduced, the index might well rem *at about the same point.* The pressure for wage incre might thus be damped down, the individual worker- an isolated individual—would not be much worse the single person or childless couple would be better but the family—the family with several children—w be heavily punished.

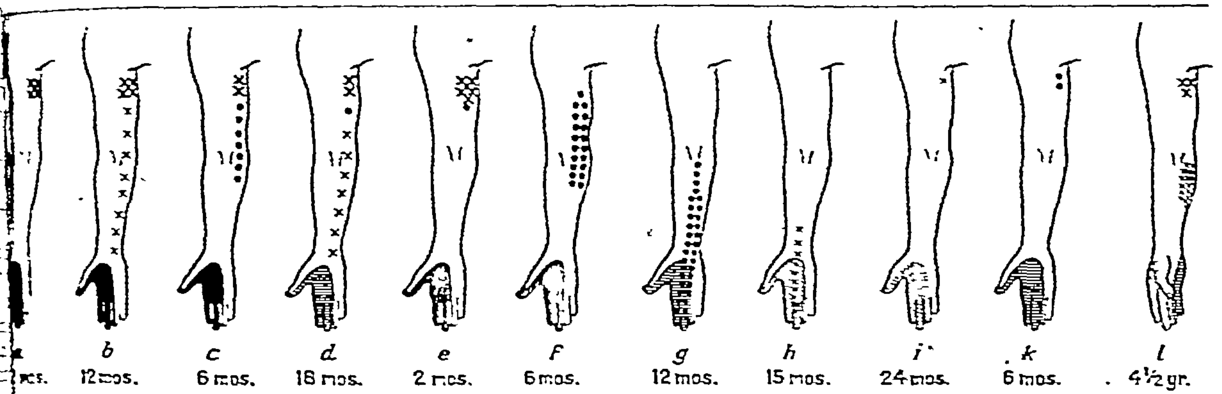
VI

It is not my purpose to discuss here the relation between the cost of living, the level of wages and sal and the economics of home-making. It is a big prob *requiring much research, and* I hope the Royal C mission on Population will provide us in its re with up-to-date information. For the truth is that comparison with the 1930s—the period of the S Survey and the family budget inquiry—we know t very little about the reality of economic life as it af the family. That, to me, is symptomatic of an all prevalent contemporary attitude. We see aroun evidence of inflation, of high expenditure on tob entertainment, and so on, and we assume that all is with economic standards. We do so, I suggest, bec we are acquiring the habit of considering the natio a collection of individuals and not of families.

We have not, in the attitudes we adopt and in policies we sanction, deliberately set out to attack *family. We have not agreed that this institution-* device well suited to its purpose through countless of *trial* and error"[14]—has failed. Some of the deve ments in our social and economic life are the resul acts of policy aimed at other objectives. We h manipulated the instrument of taxation, for instan to induce more married women to work. Wheth has produced the desired result I do not know, what I do suggest is that this policy has been pu without conscious thought for the interests of family. It need not have involved harming the fa

My purpose in discussing the problems of Service and the cost-of-living index was to give force precision to the general argument of this paper. T examples show that the debate about the popula question during the last fifteen years has made li impression on public policy. They demonstrate some of the characteristic ideas of our age still rev round the individual. And we note the absence *strong protesting voices.* This must mean approv at least unconscious approval by that section of *community who play such a large part* in focusing influencing public opinion. By contrast, the profo effects of the first intellectual approach to the populat problem in the age of Malthus and his followers striking.

I do not think that the relatively high birth-rate the last few years—a rate which is now declining again has been responsible for the lack of interest in the subj of population, or in the wider aspects of the situati of the family in modern society. While the trend the birth-rate since about 1943 may *have* confu some people—as it did in the early 1920s—we mu remember that this is not a trend in *favour* of lar families. By and large, it is the result of more a earlier marriages and the birth of more first and seco children. The number of large and medium famil has continued to decline. Between 1939 and 1945,



MPLETE SENSORY LOSS ☐ SLIGHT SENSORY LOSS • MEDIUM RESPONSE
DERATE ▪ " × STRONG RESPONSE × MILD "

's test: a no regeneration; b negligible regeneration; c and d, stages during partial regeneration; e, f, g, h, stages during complete eration; i, almost complete regeneration; k partial lesion without regeneration; l, severe lesion with poor recovery, axonal sion and sensory fibres ending in the long flexor and interossei muscles.

: these later fibres produce only slight further y of the more simple muscle actions or cutaneous ity (figs. c and d). There is less disproportion n the neuroma and nerve responses than in the groups, which sometimes makes the test difficult s, especially when the lesion is deep. The decision or not to resect depends broadly on (1) the ed proportion of fibres in the first wave—i.e., er they represent the majority, half, or a minority fibres in the nerve—and (2) how much recovery, ly in distal functions, the surgeon thinks would ace after suture. If it is accepted that axonal n is, in general, less after a lesion in continuity after suture, few cases in this group require

IV : *Complete Regeneration.*—When all the aths are intact, percussion of the dense wave elinated axon tips advancing simultaneously e nerve produces as strong a sensation as the response does in groups I and II. There is a one or two months before this advance is le, and then it progresses about 3 in. a month). The sensation from the lesion is for a time o, but not stronger than, that from the nerve; becomes weaker and finally disappears within ths of injury, after the zone of response has completely into the distal segment (fig. f). This vances like a wave some 6–12 in. long, and behind nerve no longer responds to percussion. It is sumed that not more than 12 in. of a regenerating and possibly much less, is sensitive to mechanical ation before it is effectively insulated by myelin. maturation is not necessarily yet complete. advancing wave from an upper-arm lesion, for ple, reaches the distal forearm before the long muscles begin to contract; when it reaches the rea, sensibility returns rapidly (fig. g), and recovery l advanced as its tail disappears (fig. h). If y is not quite perfect, the tail of the wave may ngthened by a few straggling fibres; and, after it disappeared, slight tingling may persist from the ma, showing that a few fibres are permanently up—this is reflected in slight residual sensory ment, probably confined to the digits, and perhaps al muscular weakness, though this is more difficult tect (fig. i). In such cases a permanent fusiform ing of the nerve can sometimes be palpated, en during late operation on neighbouring nerves.

COMMENTS

peripheral reference of the tingling to the cutaneous ution must be verified, especially when several ed nerves lie together, since it indicates which is responding—e.g., whether ulnar, median, or internal cutaneous in an upper-arm injury.

Transmission of stimulus is negligible, except sometimes through an extensive thick scar or from a percussed insensitive nerve to a nearby sensitive one—e.g., between median and ulnar in the forearm—but this is recognised from the peripheral reference of the tingling.

The *strength of response* is modified by the depth of the nerve and whether it lies on firm or soft structures. Stronger percussion or deep pressure is required in muscular regions, especially when a fracture has distorted the anatomy. Tendons covering the nerve should be relaxed as in the distal forearm: it is always difficult to obtain a response from the peroneal nerve behind the biceps tendon. The ulnar nerve should be percussed close to the dorsal border of the ulna and not on the anterior aspect of the forearm. Before percussion is repeated, tingling must be allowed to subside, which may take 10–15 sec.; and percussion should begin on the distal insensitive portion of the nerve. With experience it soon becomes possible to assess the strong disagreeable and the weaker not unpleasant sensations, and to estimate good or poor regeneration from examination of the peripheral segment alone when the lesion is inaccessible, as in the axilla. The test is generally easier in the upper extremity.

Interval after Injury.—Tinel's test has no value during the first two months. After that one quickly suspects which cases must have resection (groups I and II) and which are showing good spontaneous regeneration (group IV). This can be confirmed at the latest by three or four months when the lesion is superficial, and from four to six months when it is deep, because by then fibres held up in the neuroma have made it more sensitive, while those in the nerve have advanced several inches. Group III cases, in which the nerve tingling is not so strong, and that from the neuroma not so weak, as it should be for good recovery, may require another month or two for the wave to travel further and facilitate comparison of the responses.

The *rate of advance* could not be observed at sufficiently regular intervals for obtaining accurate data. It seemed, however, that, as others have stated, the initial latent period before axons begin advancing down their own intact sheaths is shorter, perhaps by several weeks, than when they must find new channels; but that, once they have started, there is little, if any, difference in the rate of advance. There is not sufficient difference in distances covered in a given time after injury to indicate the type of damage, more especially as the wave may be mixed. For this reason we assess Tinel's test entirely from the relative strengths of the sensations and not from the rate of advance nor, as already stated, test. It appears to have been generally assumed, after Tinel (1917) had described the test, that any response at all from the distal segment could be regarded as a good prognostic sign; but it was soon found that, though some cases with a (presumably strong) response subsequently had good functional recovery, others with a (presumably weak) response had none. The test consequently fell into disrepute and was neglected as being unreliable in prognosis, which it undoubtedly is when interpreted solely on the presence or absence of response from the distal segment alone (usually referred to as Tinel's sign), because it seems that very few stray fibres—too few for useful recovery—can produce tingling. But all regenerating sensory axons are sensitive, whether they are advancing along the nerve or are held up in the neuroma; hence the situation of most of the fibres can be determined by comparing the strength of the sensations induced by percussing the distal segment and the neuroma. If the test is interpreted in this manner it is believed to be more helpful than any other method of assessing the amount of regeneration that is taking place before motor or sensory recovery appears, and of determining the absence of satisfactory spontaneous regeneration. It was relied on almost entirely in deciding whether to operate (and resect) after about the fourth month, and it is believed that the test is sufficiently useful and important to warrant an account of its application which, as has been discovered, is similar to that described by Tinel.

PATHOLOGICAL TYPES OF FIBRE DAMAGE

The test is concerned only with regenerating sensory axons, and it is the damage to individual fibres and their sheaths that matters; the naked-eye lesion, whether complete division of the nerve or lesion-in-continuity, is unimportant. Three degrees of fibre damage may be recognised as regards its effect on recovery.

Type I.—Both the axon and its sheath are broken, and the sprouting axon is prevented by scar or wide separation from entering the distal segment of the nerve. All such axons coil about inside the neuroma and make it increasingly tender (as happens in amputation stumps).

Type II.—Both axon and sheath are broken, but the young fibre succeeds in entering a distal channel. The fibre may enter its own sheath if the ends remain together but, if they are displaced, as must usually happen, it is more likely to find another channel. Greater displacement or obstruction causes a further delay of weeks or months before the fibre finds a Schwann tube (or it may never do so as in type I); hence there is likely to be a continuous small stream of delayed fibres passing down the distal segment of the nerve for a long time after the first wave. This type of lesion, which probably occurs in its purest form after a good suture, inevitably leads to much axonal confusion and wastage through fibres entering wrong channels, and the degree of recovery is influenced by the similarity or diversity of functions subserved by the nerve (cf. radial and median). For clinical convenience each sprouting axon is referred to as a single fibre, though it actually divides into many thin branches or fibrils which may enter many sheaths; each sheath at first contains up to a dozen branches, probably from different fibres, but only one survives and matures (Young 1942).

Type III.—The fibre sheath remains intact, with the result that the broken axon regenerates inside it and must reach its own end-organ. If all fibres are thus affected (axonotmesis), functional recovery is complete.

As regards the nerve lesion as a whole, the types I, II, and III of individual fibre damage, followed respectively by no recovery, partial recovery, and complete recovery of nerve function, may occur alone or together, though a pure type II is hardly possible, because some axons inevitably remain stranded in the neuroma. In mixed lesions, therefore, some fibres may be perm nently held up, others find channels of any kind af various delays, and the remainder regenerate quicl and correctly. Pure types I and III lesions can be d tinguished clinically (groups I and IV below) by Tin test after three or four months, but mixed lesions sh such well-marked variation in functional recovery tl they have been subdivided into two clinical gro (groups II and III).

These three pathological types differ slightly fr the classification (Seddon 1944) of nerve injuries i neurotmesis (which includes types I and II), axonot (type III), and neurapraxia (in which there is no ax degeneration, and, being of no importance in rela to Tinel's test and operation, is not considered here).

CLINICAL GROUPS

On the basis of Tinel's test, nerve injuries fall four clinical groups. It is assumed in the follo description that there has been sufficient time for fi to grow at least several inches along the distal segm

Group I: No Regeneration.—Tapping on the n lesion (pathological type I) produces tingling whic mild during the first few weeks and then beco stronger when the sprouting axons are more exp inside the neuroma. (The reverse of this is seen in almost complete disappearance of response at the su line immediately after resection of a tender neuro In striking contrast, and of equal importance, is absence of tingling on percussing the distal seg (fig. *a*). This response does not differentiate bet complete division of the nerve and a complete lesio continuity, nor does it matter; it shows that all fi are held up at the lesion and it is an absolute indica for resection.

Group II: Negligible Regeneration.—In many so (mixed) lesions, which to the naked eye resemble th in group I, a few stray fibres succeed in passing obstruction in a lesion-in-continuity, or in bridgin gap of several inches. The sensation from the neur is virtually as strong as in group I, but tingling also be obtained from the distal segment, though i weak. Some fibres are therefore regenerating along nerve, but the well-marked difference in the stren of the sensations shows they are few and insufficient useful recovery (fig. *b*). There is never more th slight improvement of sensibility on the palm or s resulting mainly from the encroachment of fibres fr neighbouring normal nerves, but none on the dig and only rarely slight action in the proximal musc principally those of the tendo Achillis. The persisten strong neuroma response is a more important progno sign than is the weak tingling from the periph segment. This response also is an absolute indicat for resection.

These cases might well be included in the next gro but they have been segregated to emphasise the f that a weak nerve response, which is sometimes refer to as a false Tinel's sign, has no significance for recove It was, no doubt, this group that brought the test in disfavour. The importance of differentiating groups and III was first appreciated in cases operated on at late stage.

Group III: Partial Regeneration.—These intermedia cases show a wide range of partial recovery, varyi from slight to good. All three types of fibre dama may be present (and perhaps also fibres undamag or originally affected by neurapraxia). There is like to be a preponderance of type III (axonotmesis) aft a slight injury, whereas more severe lesions contai only types I and II, as after suture. The advancin wave may therefore be strong or weak, and long aft it has reached the digits the nerve remains sensitiv showing that other fibres are continually leaving th

Quick Exclusion of Nerve Injuries

llent descriptions of the essential minimal examin for quick routine exclusion of damage to nerveks are available (Russell and Harrington 1944). y rightly include an account of trick movements, some are difficult to identify without careful examinawhich may be prevented by an extensive wound, ure, or covering plaster. Further, the possibility abnormal innervation of intrinsic hand muscle or of e to muscular branches may cause uncertainty. eous sensory fibres are on the whole less vulnerable trauma than are motor fibres. Pain sensibility is ore relied on for the three principal mixed nerves, use it gives a better indication of the minimum of s damage than does muscular paralysis; also it re easily tested in ill patients, in whom reflex ment of a limb in response to pain is more readily ed than voluntary movement.

e main nerves to the limbs are concerned chiefly sensation and movement of the digits, which are ys affected as much or more than proximal functions. integrity of the nerve-trunk can therefore be ed by examining the digits. Additional information other muscles are paralysed is of no immediate rtance; for, if there is an isolated muscle paralysis, eans damage either to the muscle or to its nerve h, the repair of which is rarely practicable.

tests recommended, no matter how trivial or severe the wound or injury to the limb, are (1) if ck sensibility on the ends of the index and little s and the great toe is normal or nearly so (in son with the corresponding area on the opposite), there is no serious damage to the median, ulnar, tibial nerves; and (2) extension of the thumb, carpophalangeal extension of the fingers (the chief ion of the radial nerve is to open widely the hand), extension of the great toe exclude damage to the and peroneal nerves, the sensory functions of which portant.

simple tests are not hindered by a properly limb plaster. They supply essential early ation that the nerves are functioning either ., partially, or not at all, which is valuable hers who may have to consider operation later. last two groups require constant attention to the ty of digital joints, repeated examinations at y intervals to exclude possible neurapraxia, and neurological examination when conditions allow. al additional information may be obtained even n the limb is in plaster—e.g., the strength of the muscles to the digits and of the intrinsic muscles. e following tests must also be made at the first ortunity: (1) biceps action by *palpating* the muscle g elbow flexion—musculocutaneous paralysis is y missed, since the elbow can still be flexed (similarly, high sciatic lesions the hamstring tendons must palpated, because the knee can be flexed by gracilis); deltoid contraction to exclude injury to the upper al plexus or to the axillary nerve—damage to the r roots would have shown in the digital examination partial brachial-plexus traction lesion (usually C5–6) y be present in addition to more obvious gunshotand nerve injuries; and (3) quadriceps femoris ion in extending the knee.

SUMMARY

Attention is drawn to the great value of Tinel's test assessing the amount of regeneration after about the urth month following injury or suture, provided it is terpreted by comparing the sensations from the lesion d the distal segment. The occurrence of tingling om the distal segment alone is unreliable, because it ay result from the presence of too few regenerating bres for useful recovery.

The simplicity of routine quick exclusion of damage to nerve-trunks immediately after injury or later is emphasised.

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SAFETY OF INTRAPERITONEAL AND INTRATUBAL PENICILLIN

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Frisk and Westman,[1] investigating the absorption of penicillin instilled into the fallopian tubes, recovered 51% from the urine as against 61% of intramuscular penicillin. From the fallopian tubes and the pelvic peritoneum, however, penicillin was less rapidly absorbed than when it was injected intramuscularly. Consequently, its concentration in the blood was lower, and a longer time elapsed before it was excreted in the urine. This has also been found to be the case with intrapleural penicillin.

If 20,000 units of penicillin or more is instilled every twelve hours into the fallopian tubes, a stable bacteriostatic concentration is maintained for a considerable time in both the fallopian tubes and the pelvic peritoneum. This must be of great practical value not only in combating salpingitis and pelvic peritonitis but also in preventing infection after salpingography. But it is important to ascertain whether or not penicillin has an irritant effect on the pelvic peritoneum or on the tubal mucosa; for such an effect might bring about adhesions or the agglutination of the mucosal folds in the oviducts, and the treatment would then do more harm than good.

This question does not seem to have been studied previously. This is not surprising, because penicillin is usually administered when inflammation is already present which will mask any possible irritant effect of the penicillin. To determine this question we made experiments on animals and on women.

EXPERIMENTS ON ANIMALS

The experiments were made on rabbits. Earlier experience has shown that peritoneal adhesions often form after abdominal operations on rabbits. These animals are therefore particularly suitable for the experiments to be described. In all cases a small incision was made through the skin, muscles, and peritoneum in the midline immediately below the xiphoid process. Through this opening a predetermined dose of penicillin was introduced with a cannula fixed to a syringe and gently worked into the pelvic cavity. The rabbit was held upright so that the penicillin solution remained fairly long in the lower part of the abdominal cavity.

The effect of the penicillin was assessed by the macroscopical and microscopical findings in the pelvic organs and the peritoneum, and by function tests made by mating the animals after the administration of penicillin and observing the migration of the ovum. (In rabbits the follicles rupture after coitus.)

Experiment 1.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injections to each of two rabbits. Necropsy three days later showed that a small quantity of the penicillin solution was still in the pelvic cavity; there was no redness or other sign of irritation either in the pelvic peritoneum or in the reproductive organs. Microscopically the tubal peritoneum and mucosa were normal.

Experiment 2.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injection to each of

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[1] Frisk, A. R., Westman, A. *Lancet*, 1946, ii, 118.

simply from the presence or absence of tingling from the distal segment.

Partial Lesions.—A third factor, in addition to the sensations from the lesion and the peripheral segment, must be taken into account—i.e., any cutaneous sensibility which remains after injury, because it represents undamaged fibres in a partial lesion and the greatest obtainable tingling is correspondingly less. When the residual sensibility is considered adequate, or not likely to be improved by operation, absence of regenerating fibres is not then an indication for operation (fig. *k*). The test cannot distinguish between a diffuse partial lesion and a clean partial division of the nerve.

The Significance of the Advancing Wave.—A strong advancing wave in group III, or after suture, does not, by itself, have the same good prognostic significance as in group IV, in which all the fibres are going to correct end-organs. In the latter all fibres are in the peripheral segment and the tingling is of maximal intensity, which it cannot be in group III, since some axons are held up. It is impossible to say from the strength of the tingling whether or not it is maximal; a strong wave merely indicates that many fibres are regenerating, without any clue about whether they are in right or wrong channels, for, before becoming myelinated, they appear to be sensitive in either. It is the persistence after a few months of some response from the lesion that shows the damage is not purely axonotmesis, if at all, thus making incomplete recovery a certainty, and its strength is a measure of the deficiency. A strong peripheral response merely proves that many fibres are growing distally, probably as many as there would be after suture; and there is always the possibility that some are in their own unbroken sheaths, which should not be sacrificed by resecting the lesion unless recovery is likely to be improved.

Multiple Lesions of One Nerve.—When a nerve-trunk is injured in several places, the test demonstrates, after sufficient interval, the situation of a complete block and of partial injuries proximal to it, but it does not exclude more distal injuries which might prevent recovery after resection of the complete lesion.

Brachial-plexus Injuries.—Many plexus injuries, mostly of the traction variety caused by parachute, were seen. A strong response was often obtained at the posterior border of sternomastoid muscle, which was assumed to indicate the site of the lesion. In some cases the response zone progressed downwards across the axilla and along the nerves in the arm, where the sensation was strong and was referred to the correct skin areas; unfortunately, the patients could not be kept long enough for distal function to return, but good recovery was already taking place in proximal muscles and sensation. In others there was no extension of response to the arm and no recovery. After a few severe injuries, percussion did not elicit tingling anywhere and there was no recovery (but the cases were not observed for longer than twelve months); the lesions may have been very high, near the intervertebral foramina and inaccessible to percussion, but the important prognostic sign is the absence of response above and below the clavicle. These observations are incomplete, but it is believed that Tinel's test can be of great value in assessing the prognosis of brachial-plexus injuries after a few months.

Axonal confusion can be demonstrated by Tinel's test after severe injuries. It was first noted about $1^1/_2$–2 years after upper-arm lesions with only slight spontaneous recovery. Weak tingling from the peripheral segment showed that a few axons were still growing distally, but it was considerably stronger in the proximal half of the forearm, where it should be weaker because of the overlying muscle, than elsewhere. This stronger sensation was obtained from a wide area corresponding
to the bellies of the muscles *supplied* by the n
and was therefore regarded as evidence of se
fibres having regenerated along motor channels int
muscle where they remained excitable. The same
was observed after severe sciatic injuries.

A clearer demonstration was seen, for example, in a
with a severe unoperated lesion-in-continuity of the
nerve near the axilla, $4^1/_2$ years *after* being wound
May, 1940. There had been only a little spontaneous rec
as shown by slight action of the flexor carpi ulnari
flexor profundus muscles, much wasting and paralysis
intrinsic muscles, a little poor-quality sensibility in the
area, and a tender neuroma indicating a large hold
fibres. Percussion along the nerve to the elbow and i
distal forearm elicited no sensation, but over the
carpi ulnaris muscle and on the dorsal interosseous s
especially the first, it produced considerable tingling re
always to the little finger (fig. *l*); this tingling disapp
during procaine block of the ulnar nerve at the elbo
was concluded that the sensory fibres, including the
motor channels, had become myelinated, except their
which remained sensitive within the muscles.

This late response from the muscles can hardl
confused with a strong advancing wave prec
good recovery, because it appears some m
later, is associated with signs of a severe lesion,
persists.

This observation seems to show that fibres in w
channels do not atrophy in spite of failing to esta
a functional connexion, important though that ap
to be for full maturation (Sanders and Young 1
neither do sensory fibres ending blindly in a neu
atrophy. In rabbits the terminal ramifications of
directed sensory axons have been demonstrated in
connective tissue between muscle-fibres at least tw
months after their arrival (Gutmann 1945), but
not clear where the myelin ends.

Relationship between Sensory and Motor Reco
—Since there is no method of demonstrating regenera
motor axons, it is necessary to consider the rela
damage sustained by sensory and motor fibres
their recovery. Motor fibres are more vulnerable
injury than cutaneous sensory fibres and may be
only fibres affected (by axonotmesis which recov
completely), but injuries that tear the fibre shea
seem to affect both kinds of fibres more or less equa
Therefore the end-result, whether good or bad, to
expected from spontaneous regeneration, as indica
by Tinel's test for sensory fibres, may also be infer
for the motor fibres; it is impossible to have an abund
correct regeneration of sensory fibres and none of mo
fibres, or vice versa.

In conclusion, nerve recovery should be thought
not as the recovery of one nerve but of innumera
nerves within it. The aim in treatment is to ob
maximal regeneration of axons in the hope that
many as possible will reach correct or reasona
appropriate end-organs. It is believed that Tin
test, which is a quantitative test, is the best availa
method of assessing the volume of down-growing ax
The decision about resection is easy when the test sho
clearly either good or poor regeneration, but in bord
line cases the surgeon's attitude will be influenced
which nerve is concerned and whether the lesion
high—i.e., above the proximal muscles, which are
only ones likely to recover—or low. The tende
should be towards conservatism, and even a mino
of intact fibres should not be sacrificed, especially wh
sensation is important. Tinel's test entails waiting
several months after injury, which is *often* necess
for other reasons; and it will be interesting to lea
when the final follow-up results appear from the ner
injury centres, what effect *delayed suture*, within
reasonable time, say, six months, has on recover
especially of proximal as compared with distal muscl

nosed definitely if nasal biopsy shows a typically rgic mucosa with its characteristic feature of eosinoil infiltration, and cure can only be claimed if this ucosal pattern returns to normal as the result of atment. It is well known that many non-specific uences may play a part in the aggravation of this order, not the least of which is the psychological one. ause of this any study designed to estimate the tency of a new preparation in chronic rhinorrhœa st be carefully controlled.

Conditions of the Experiment.—We used anthisan ause it is the most specific anti-histamine drug. We ose 37 patients all of whom had had the typical mptoms of rhinorrhœa, sneezing, and nasal blockage at least six months and on nasal biopsy showed the racteristic histology. Cases with sepsis and large ypi were excluded. The series consisted of 16 males 21 females aged 10–53 years. Before treatment with hisan was begun, every patient was given dummy lets of similar appearance for two weeks. This was e to assess, if possible, the emotional factor in the dition, and it also trained the patient to take the lets regularly. During this period we rejected cases in ich nasal biopsy did not show an eosinophilia sufficient warrant the diagnosis of allergy.

The results were as follows:

	Inactive tablets (*cases treated* = 37)		*Anthisan* (*cases treated* = 35)
plete relief, with reversion of mucosa to normal	2 = 5%	..	19 = 54%
me relief"	13 = 35%	..	12 = 34%
lief	22 = 60%	..	4 = 12%

ring the control period 35% of patients had "some ef," though the appearances of the nasal mucosa e unaltered on inspection. Such are the vagaries of motor rhinorrhœa that 2 patients, both females, erienced complete relief of symptoms while taking tive tablets and subsequent biopsy revealed a normal mucosa. The remaining 35 patients were then anthisan 0·6 g. in the day in divided dosage. me there was improvement with as small a dose g. in the day, whereas 4 patients required 0·8 g. for complete relief. The treatment was continued four weeks. Two control biopsies were done, one ediately after completion of treatment and one a nth later. The tabulated results show that 54% of tients obtained complete relief of symptoms, with version of the nasal mucosa to normal, and that % had "some relief," without significant alteration the nasal histology. It is considered that these latter es must be disregarded in the therapeutic assessment this preparation because of our experiences with dummy" tablets. Only 4 cases obtained no benefit.

None of the patients who obtained complete symptoatic relief and histological "cure" have reported in past six months for further treatment, though it s impressed on them to do so if symptoms recurred. ost of those who experienced "some relief" continue attend the department.

Side-effects developed in the same frequency as reported Hunter and Dunlop.[3] In no case were they severe ough to interfere with treatment.

Conclusion.—This experiment establishes that over alf the cases of perennial vasomotor rhinorrhœa may at least temporarily cured with anthisan. Some 35% patients in our series experienced "some relief" with nthisan, but the use of control periods and nasal biopsy oth suggest that this effect may be psychological.

We are indebted to Dr. R. F. Ogilvie and Dr. A. C. P. ampbell for their reports on the nasal sections; and to Prof. D. M. Dunlop and Dr. I. Simson Hall for advice and riticism. Anthisan tablets and control tablets were provided by Messrs. May & Baker Ltd.

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MYANESIN IN TETANUS

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WEST MIDDLESEX COUNTY HOSPITAL

The favourable effects of 'Myanesin' in two cases of tetanus reported by Belfrage (1947) prompts us to publish a third case of tetanus in which myanesin apparently gave much benefit.

On May 8, 1948, a man, aged 62, was working in a garden shed when a glass jar fell from a shelf and made a cut about $^1/_3$ in. long on the left occipitoparietal region of his bald head. Bleeding was insignificant, and a dressing was applied without any cleansing. It is noteworthy that the patient's 5-year-old grand-daughter had played with this jar in the garden, where horse manure had been piled the previous year.

On May 12, while shaving, the patient noted that the left side of his face felt tight, and on looking in the mirror he saw that that side of his mouth seemed to be drawn up, and his left eye was watering and difficult to open. Next day he developed prickling sensations lasting a few seconds, starting in the lumbar region and spreading to the abdomen and waist. They occurred every hour or so and were so unpleasant that he was afraid to touch the skin during them. In the next few days these symptoms became more severe, and his mouth became difficult to open, so that he could not wear his false teeth or eat comfortably. By the 19th his mouth was so difficult to open that he could not eat at all, and his left eye was almost completely closed, so he attended a hospital.

On May 23, eleven days after the first symptoms, he began to have spasms of pain. At first the pain was not very severe; it started in the lumbar region and spread to the abdomen, and then up to the chest and armpits and down to the hips and feet. He described it as like a severe cramp; it came about every hour at the start and lasted only a few seconds, during which his body tended to straighten out. These paroxysms became gradually longer, more severe, and more frequent, and he found that they were induced by a slight cough, so that he became afraid to drink lest he should choke and so precipitate a spasm. On the 27th he was admitted to the West Middlesex County Hospital as an abdominal emergency.

On admission he was having obvious attacks of pain. The sheet on which he was lying was soaked with sweat. In every spasm beads of sweat broke out on his body, his face was contorted, the muscles of the neck stood out, his limbs stiffened, especially his legs which flexed at the hips and knees, and his abdominal muscles became rigid, showing clearly the intersections of the recti. These attacks came on every 5 min. if he were not disturbed, but they were precipitated by the slightest movement or the gentlest examination. His temperature was 99°F, respirations 20 and pulse-rate 92 per min., weight 123 lb. The left eye was partially closed in repose but could be opened fully; there was presumably spasm of the orbicularis oculi. His left cheek felt stiff, and his mouth was drawn up on that side from spasm of the facial muscles; he could open his mouth only about $^3/_4$ in. There was no neck-rigidity. His bald head showed a small completely healed scar in the left occipitoparietal area, which was not tender. The abdominal muscles were tense. All four limbs were stiff, the legs more so than the arms. Reflexes were all brisk, especially in the legs, which showed bilateral unsustained ankle clonus and right patellar clonus. The plantar reflexes were flexor. No other abnormality was found in the central nervous system. The heart showed a triple rhythm, the blood-pressure was 230/100 mm. Hg, and the vessels were arteriosclerotic. Tetanus was diagnosed.

Treatment.—During the first night the patient was given two injections of morphine gr. $^1/_2$. Next morning, May 28, to enable a lumbar puncture to be done, anæsthesia, or at least relaxation, was necessary; so myanesin, 1 g. in 10 ml. of water, was diluted with an equal quantity of water, and was injected intravenously. This dilution was used in all subsequent intravenous injections except one. The immediate effect was complete relaxation from all spasms, and it was decided to two rabbits. Necropsy two weeks later showed nothing abnormal either macroscopically or microscopically.

Experiment 3.—Penicillin 200,000 units in 30 ml. of solution was given by intraperitoneal injection to each of two rabbits. Necropsy two weeks later showed no change.

Experiment 4.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injection to each of two rabbits. Necropsy ten months later showed no change.

Experiment 5.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injection to each of two rabbits six hours before coitus. A normal pregnancy ensued.

Experiment 6.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injection to each of two rabbits twenty-four hours before coitus. A normal pregnancy ensued.

Experiment 7.—Penicillin 20,000 units in 20 ml. of solution was given by intraperitoneal injection to each of two rabbits seven days before coitus. A normal pregnancy ensued.

STUDIES IN WOMEN

Penicillin was instilled via the fallopian tubes into the pelvic cavity with the instruments used in salpingography at different times before a predetermined laparotomy. Patients were selected whose past history and condition warranted the assumption that neither old nor fresh pelvic inflammation was present. The material obtained at operation was examined microscopically, special attention being given to the fimbriæ of the tubes, which are particularly sensitive and respond readily to the slightest irritation. The mucosa also was carefully examined. In none of the following cases were there any microscopical evidence of a reaction.

Case 1.—Operative sterilisation. Penicillin 20,000 units in 15 ml. of solution was instilled on the day before operation. At operation a small amount of bloodstained fluid was found in the pouch of Douglas. There was no microscopical evidence of changes either in the peritoneal covering or in the mucosa of the tubes.

Case 2.—Myomectomy. Penicillin 20,000 units in 20 ml. of solution was instilled two days before operation. At operation a small amount of bloodstained fluid was found in the pouch of Douglas.

Case 3.—Operative sterilisation. Penicillin 20,000 units in 20 ml. of solution was instilled three days before operation.

Case 4.—Operative sterilisation. Penicillin 200,000 units in 60 ml. of solution was instilled daily for four successive days before the day preceding operation. At operation a moderate amount of bloodstained fluid was found in the pouch of Douglas.

Case 5.—Operation for ovarian cyst. Penicillin 40,000 units in 40 ml. of solution was instilled six and five days before operation.

Case 6.—Myomectomy. Penicillin 20,000 units in 20 ml. of solution was instilled daily eleven and ten days before operation. At operation a small amount of slightly bloodstained fluid was found in the pouch of Douglas.

Case 7.—Operative sterilisation. Penicillin 200,000 units in 60 ml. of solution was instilled thirteen and twelve days before operation.

DISCUSSION

In the experiments on animals penicillin was directly injected into the pelvic cavity. The powerful suction which takes place in the fallopian tubes, particularly in connexion with the rupture of the follicles,[2] justifies the assumption that a fairly large amount of penicillin is thereby introduced into the oviducts.

In the experiments on women penicillin was instilled via the fallopian tubes and thus came directly into contact with their mucosa.

In some cases a comparatively large dose of penicillin was given. In most of the experiments on animals 20,000 units of penicillin in 20 ml. of solution was administered (in the third experiment 200,000 units of penicillin was given). The average weight of the rab
being about 3000 g., this dose was comparati
large. Some of the women were given a larger
than has hitherto been administered by instilla
into the fallopian tubes. In the fourth case 800,
and in the seventh case 400,000, units of penicillin
given in 4 and 2 days respectively. In all these c
the microscopical examination was made fairly
after the treatment with penicillin, the longest inte
being 13 days (case 7). For practical reasons it
impossible to lengthen the interval between the treatn
with penicillin and the operation. On the other h
I have observed several cases where the patients bec
pregnant one or several years after an operation
occlusion of the tubes and postoperative treatn
with penicillin. These observations strongly sug
that the possibility of penicillin therapy having
effects may be ruled out. In experiment 4 there
no evidence of changes either in the pelvic cavit
in the tubes despite the fact that 10 months ela
between the penicillin treatment and necropsy.

The experiments on animals and on women
yielded identical results. Microscopically, there wa
evidence of changes in the pelvic peritoneum or in
peritoneal covering or in the mucosa of the fallo
tubes attributable, to an irritant effect of penic
irrespective of whether the microscopical examina
was made soon or long after its administration.
function tests in rabbits have shown that penicillin
not interfere with the mechanism controlling migr
of the ovum.

This study has produced evidence that penicillin
not cause either toxic or chemical damage interfe
with migration of the ovum, and that it can be s
used in the local treatment of inflammation in
reproductive organs. This opens up new therap
possibilities of combating salpingitis and its sequelæ

SUMMARY

Before using penicillin in the prophylactic and th
peutic treatment of the fallopian tubes and the p
cavity it was important to ascertain whether penic
causes any irritation which might bring about adh
or any other damage interfering with migration
the ovum.

Experiments on animals and observations in wo
have shown that penicillin does not cause any
change.

ANTHISAN IN PERENNIAL VASOMOTO RHINORRHŒA

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It is generally agreed that the administration
anti-histamine drugs improves some cases of perenn
vasomotor rhinorrhœa (allergic coryza), but publish
reports show that there is considerable variation in t
response to treatment with different preparatio
Feinberg[1] found that only 15% of cases responded
treatment with 'Benadryl,' whereas 64% were improv
with 'Pyribenzamine,' some of the cases which did n
respond to benadryl being much benefited by pyribenz
mine. Calder[2] treated 38 cases of vasomotor rhinorrhœ
with 'Anthisan' and found that 76% of them we
improved.

For the purpose of experimental work we consid
that perennial vasomotor rhinorrhœa can only

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[2] Westman, A. J. Obstet. Gynæc. 1937, 44, 821.

[1] Feinberg, S. M. J. Amer. med. Ass. 1946, 132, 702.
[2] Calder, A. G. S. Lancet, 1948, i, 863.

CONCLUSION

The beneficial effect of myanesin in this case was so vious that it is hoped that it may be given an extended al in further cases, including its exhibition by mouth well as by intramuscular and intravenous injection.

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ACUTE TOXIC ENCEPHALOPATHY OF NKNOWN ÆTIOLOGY IN TWO BROTHERS

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ACUTE toxic encephalopathy of unknown ætiology is e, and I have not been able to find any other report the simultaneous affection of two members of a usehold.

CASE-REPORTS

The brothers, A.B. and C.B., aged 17 and 12, had not viously had any serious illness. On Dec. 13, 1947, A.B. eloped acute tonsillitis and was confined to bed. His diet sisted of fluids only until the 16th, when he had a cereal h milk in the morning and in the afternoon felt well ugh to want solid food. At this time C.B. was in his usual d health. Their mother prepared a soup from stock made o days previously, and a stew from meat which had also n cooked two days previously and had contributed to the k, with potatoes, onion, carrots, and a proprietary vouring and colouring agent. This meal was eaten at P.M. The parents and both boys had the soup, but the , apart from a taste taken by the mother, was eaten only boys, each of whom had a large helping. C.B. then went eturning in a few minutes with some sweets, which he d with his brother.

ut an hour after the meal the father felt dizzy—"as nk"—for about 5 minutes. The mother felt no ill effects. is time A.B. complained of headache and nausea and a later went to bed. He did not actually vomit. At 8 P.M. B. returned home and said he had vomited at a friend's e, and felt "rotten." He went straight to bed.

The boys' illness was so fulminating that at no time after s could the parents communicate with them. During the ceeding hours the boys were restless and groaning. Their ents visited them several times and noted that each boy s clasping his abdomen as if in pain; but since they did reply to questions they were assumed to be asleep and be restless owing to some simple abdominal upset.

At about 3 A.M. on Dec. 17, however, the parents heard a turbance in the boys' room and found both boys out of d, standing stiffly erect with jaw dropped, frothing at the uth, and with arms held flexed at the elbows and pronated. ey resented interference, and much difficulty was experi- ced in removing them to the Manchester Royal Infirmary, ich they reached at 6 A.M. on the 17th.

On admission, A.B. was comatose and lay quietly unless turbed. Temperature 97·6°F, pulse-rate 106, and respira- ns 26 per min. Examination was violently resented and led screaming and vigorous movements. The eyes were closed: ismus, photophobia, and neck-rigidity were present, and ttempts to open the eyes or mouth or to flex the neck forwards ain produced screams and violent movements. The pupils ere moderately dilated but reacted to light; the eyes spontaneously moved freely in all directions. No defect was detected in the remaining cranial nerves, so far as they could be tested. Power in all limbs was good, reflexes were brisk, and plantar responses flexor. Kernig's sign was negative. No abnormalities were detected in the heart. After sedation with thiopentone 0·5 g. intramuscularly the fundi were examined and found to be normal, and relaxation of trismus allowed inspection of the tonsils, which were large and hyperæmic but no exudate was present. Lumbar puncture was then performed. It was impossible to estimate the pressure owing to continuing restlessness. The fluid was clear and colourless and flowed freely: it contained 10 leucocytes per c.mm. (6 lymphocytes and 4 polymorphs) and protein 30 mg. per 100 ml. Unfortunately the fluid was not examined in more detail. A blood-count showed red cells 5,350,000 per c.mm., Hb 104%, and white cells 17,400 per c.mm. (polymorphs 91%, lymphocytes 6·5%, large mononuclears 2%, eosinophils nil, basophils 0·5%).

C.B. on admission also lay quietly unless disturbed and was apparently comatose. Temperature 97°F, pulse-rate 100, and respirations 20 per min. During examination, however, he opened his eyes and said "I can't see anything." Neck-rigidity, trismus, and photophobia were present, and he resented interference like his brother. The pupils were not dilated and reacted to light; spontaneous ocular movements were full in each direction. Power in all limbs was good; reflexes were brisk, and plantar responses flexor. Kernig's sign was weakly positive. The throat appeared healthy, and no abnormality was detected in the heart, lungs, or abdomen. Lumbar puncture after sedation revealed a clear colourless fluid containing 3 lymphocytes per c.mm. and protein 25 mg. per 100 ml. A blood-count showed red cells 4,450,000 per c.mm., Hb 86%, and white cells 14,200 per c.mm. (polymorphs 86·5%, lymphocytes 11·5%, large mononuclears 2%).

The patients presented a strikingly similar picture of meningeal and cerebral irritation, though C.B. was not so deeply unconscious as A.B., the moderate dilatation of the pupils was present in A.B. only, and C.B. had a weakly positive Kernig's sign. It was thought likely that the cause was some exogenous poison, and the findings indicated that A.B. was the more seriously affected. The signs did not suggest poisoning with belladonna or other alkaloid, and the early onset of unconsciousness ruled out botulism. There had been little vomiting and no diarrhœa, but abdominal pain had apparently been present, and heavy-metal encephalopathy appeared to be a possibility. Treatment was therefore begun with dimercaprol (B.A.L.), A.B. receiving 120 mg. four-hourly, and C.B. 80 mg. four-hourly. Penicillin 30,000 units three-hourly was given to A.B. because of the throat infection, and both patients were given rectal saline. Sedation was continued with small doses of paraldehyde per rectum.

Progress

The illness developed in the two patients along almost identical lines. Throughout the day of admission cerebral irritability remained the dominant feature. Both boys showed an increasing neck-retraction, which became extreme towards the end. During the morning of admission clonic jerking of the arms and legs and nystagmus were present at rest and with vertical and horizontal ocular deviation.

Dr. Fergus R. Ferguson, who saw the patients, could not recollect having seen two similar cases at the same time, and he thought that the presumptive diagnosis was acute toxic encephalopathy probably due to an exogenous toxin.

On the day after admission both boys were quieter and no longer responded excessively to stimuli. Trismus was not now in evidence, but A.B. had developed a right-sided facial paralysis. Conjugate upward deviation of the eyes was present in both cases, and the pupils were moderately dilated and reacted sluggishly to light. C.B. showed rhythmical movements of his head and opening and closing of his lower jaw. The reflexes remained equal, and the plantar responses flexor. Both boys were incontinent of urine, but the bowels were not opened. A further lumbar puncture did not reveal any change in the findings.

Respiration became shallow, but the rate was not increased, and cyanosis appeared. Oxygen was given by B.L.B. mask, and electrical suction was used to aspirate mucus from the upper respiratory tracts. After progressive deterioration A.B. died at 5.15 P.M., and C.B. at 10.50 P.M. There was a rise in temperature before death, in A.B. to 103°, and in C.B. to 100·4°F.

Necropsy Findings (Dr. William Susman)

In A.B. both lungs were distended and showed hypostatic congestion and œdema. The mucosa of the œsophagus, stomach, duodenum, jejunum, and upper ileum was acutely congested, with a large amount of adherent catarrhal exudate. There was a brownish tinting of the gastric mucosa, suggesting breakdown of blood pigment, and there were scattered hæmorrhagic erosions on its surface. Six ulcers about 3 mm. in diameter were present in the first part of the duodenum. The remainder of the small intestine and the large intestine showed patchy acute congestion and passive congestion. The liver continue myanesin as a therapeutic agent. An initial intramuscular injection of 200,000 units of antitetanic serum was given, and penicillin 30,000 units was injected four-hourly from May 28 to June 8. The full sedative treatment was as follows:

Date	*Time*	*Sedatives*
May 27	10 P.M.	Morphine gr. 1/3
May 28	6 A.M.	Morphine gr. 1/2
	11 A.M.	Myanesin 1 g. I.V.
	8.45 P.M.	Myanesin 1 g. I.V.
May 29	4.30 A.M.	Myanesin 1 g. I.V.
	5.30 P.M.	Myanesin 0·5 g. I.V., and 0 5 g. I.M.
	9 P.M.	Myanesin 1 g. I.V.
	10 P.M.	Pentobarbital sodium gr. 1 1/2
May 30	2 A.M.	Myanesin 1 g. I.M.
	4.30 A.M.	Morphine gr. 1/4
	2 P.M.	Myanesin 1 g. I.M.
	9 P.M.	Myanesin 1 g. I.V.
	10 P.M.	Pentobarbital sodium gr. 1 1/2
May 31	2 A.M.	Morphine gr. 1/4
	3 P.M.	Myanesin 0·5 g. I.V., and 0·5 g. I.M.
	11 P.M.	Pentobarbital sodium gr. 1 1/2
	11.45 P.M.	Myanesin 1 g. I.M.
June 1	6 A.M.	Myanesin 1 g. I.M.
	11.30 A.M.	Myanesin 1 g. I.M.
	8.15 P.M.	Myanesin 1 g. I.M.
June 2	1.30 A.M.	Myanesin 1 g. I.M.
	5.15 A.M.	Myanesin 1 g. I.M.
	1.45 P.M.	Myanesin 1 g. I.M.
	11 P.M.	'Sodium amytal' gr. 3
	11.05 P.M.	Myanesin 1 g. I.M.
June 3	8 A.M.	Myanesin 1 g. I.M.
	4.30 P.M.	Myanesin 1 g. I.M.
	11 P.M.	Sodium amytal gr. 3
June 4	12.45 A.M.	Myanesin 1 g. I.M.
	2.30 A.M.	Myanesin 1 g. I.V.
	10.30 P.M.	Sodium amytal gr. 3
June 5	10 P.M.	Myanesin 1 g. I.M.
June 6	2.50 A.M.	Sodium amytal gr. 3

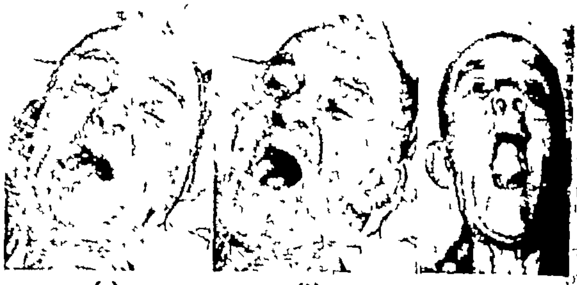
The total amount of myanesin given in nine days was 22 g. (7 g. intravenously and 15 g. intramuscularly.)

Progress.—After the last injection of myanesin on June 5 recovery was uninterrupted. There were no further spasms, and the patient could open his mouth wide enough to insert his false teeth and take a solid diet. Previously he had been fed entirely on fluids, and after the first day, when he drank little, his intake was always more than double his output. The tone of his limbs appeared normal, though that of his abdominal muscles was still a little increased and remained so for a further week. His reflexes were still brisk, but the clonus had gone. His general condition was good, his blood-pressure had fallen to 200/104 mm. Hg, and his triple rhythm had vanished. The last sign to disappear was the spasm of the orbicularis oculi on the left, which was still present until June 23, more than six weeks after it had first developed.

EFFECTS OF MYANESIN

The injections of myanesin caused no objective sensory change, but there was a feeling of a hot and pleasant flush sweeping over the body. There was no loss of voluntary power. The rigidity of the muscles was greatly reduced, and the abdomen could be palpated comfortably. The patient could open his mouth twice as wide (see figure) and he could drink in comfort and without fear. The spasm of the left side of the face became much less, and his left eye was more opened. The reflexes remained brisk, and the ankle clonus persisted. The only mental change was an emotional lability shown by two attacks of weeping, one 2 min. and one 10 min. after an injection of myanesin. Myanesin relieved the spasms and made feeding and nursing easy. Its effect lasted for about twelve hours when it was given intravenously; when it was given intramuscularly its effect lasted for only half the time. The result of giving half the dose intravenously and the other half intramuscularly was also less successful.

Hæmoglobinuria was looked for both microscopically and macroscopically but not seen, and a red-cell fragility curve done on June 1, after a total of 12 g. of myanesin had been given, was completely normal, in contradiction to the findings of Wilson and Gordon (1948). A total of 8 g. of myanesin was given intravenously in eight days and no intravascular thrombosis occurred until, unfortunately, in the early morning of June 4 myanesin was given undiluted in error, and, after some difficulty had been experienced in getting into a vein, a local venous thrombosis developed.



Effect of myanesin on lockjaw in tetanus: (a) fullest extent to wh patient could open his mouth at 11.30 a.m. on June 1 before injecti of myanesin; (b) same three minutes later, immediately after intr venous injection of myanesin 1 g.; (c) same on June 18 after recover

DISCUSSION

Severity of Tetanus.—In considering the efficiency myanesin it is necessary to assess the severity of t tetanus in this case. The early conception that t prognosis depended on the time between the infecti and the first symptom, which in this case was only fo days, suggested that this would be a severe illne Later, however, Cole (1938) stated that the time betwe the first symptom and the first spasm was more imp tant. This was long (eleven days) and, but for the clini picture, would place the case in the relatively m category. Vener and Bower (1941) put the mortality patients over the age of 40 at 50%, and stated that it w the exception for anyone over the age of 60 to survi *Not only was this patient over the age of 60* but also had hypertension and an impaired coronary circulati as shown by electrocardiography.

Sedation.—After the first night myanesin was the o drug used to control the spasms, other sedation bei insignificant. The patient was freed from pain for lo periods and yet remained fully conscious and able drink, *owing to the relaxation of the masseter* musc Nursing was made easy and was carried out with trouble in a busy general ward.

Advantages of Myanesin over Curarine.—Cases tre with curarine have been described by Mitchell (1 and West (1936). Mitchell gave curarine by in muscular injection, West by continuous intravenous dr With curarine, however, there is the danger of respirato paralysis, since the margin between the dose cau freedom from the muscular contractions and that causi respiratory failure is small. Myanesin in the doses giv has no effect on respiration, and Mallinson (1947) stat *that the dose affecting* the vital *centres* in animals w ten times that causing muscular relaxation. Furth patients given curarine are paralysed and therefore mo difficult to nurse, and the difficulties of maintaining intravenous drip for nine days are great.

Complications.—It is interesting to *note the* comple absence of complications from the use of myanesin long as it was diluted; no signs of intravascular hæmolys were seen, and the fragility of the red cells was unaffecte The accidental giving of an undiluted injection w followed by thrombosis. Pugh and Enderby (194 suggested that this complication depended entirely o *the concentration.*

Site of Action.—Berger and Bradley (1946) suppose that myanesin acted on the synapses of the cord, bu Stephen and Chandy (1947) produced evidence *to* sho its action was on the basal ganglia, since it relieved pai of thalamic origin and reduced parkinsonian tremor an rigidity. Hunter and Waterfall (1948) stopped epilepti attacks in 30 sec. by injecting myanesin. In our case too, there is some evidence that there was a centra effect, in view of the spontaneous weeping and the fact that the spasms ceased *though the* reflex activity remained brisk and clonus persisted.

HROMBOSIS OF THE ABDOMINAL AORTA

APPARENTLY CAUSED BY PRESSURE FROM A VERTEBRAL OSTEOPHYTE

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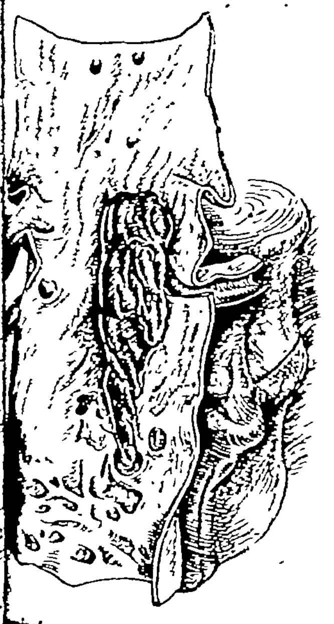
INCE the condition was first discussed by Graham 14), many cases of thrombosis and embolism of the a have been reported. Greenfield (1943) collected cases, including 5 of his own. Banowitch and Ira 8), who give an extensive bibliography, emphasise most of the cases are associated with chronic cardiac arterial disease, and that in fully half of these there history of mitral stenosis and auricular fibrillation. mbosis due to syphilitic infection is described by nfield (1943) and by Ronald and Leslie (1940), and aortic occlusion is a very rare complication of specific fever such as typhoid and influenza.



al aorta opened to show clot in distorted by vertebral osteophyte.

Of 73 cases of thrombosis of the abdominal aorta reviewed by Hesse (1921) 3 were due to external pressure—from a uterine fibroid, a uterine carcinoma, and a neoplasm of the 2nd and 3rd lumbar vertebræ. In the last case the aortic wall was invaded by the tumour.

In the case described below the cause appeared to be pressure on and distortion of the wall of the abdominal aorta by a large osteophytic rowth from the 2nd and 3rd lumbar vertebral

man, aged 81, was admitted to the Royal Masonic pital with a severe pain in the left calf of sudden onset ours before admission. Two weeks previously he had had attack of bronchitis, and a week before admission a rt attack."

xamination the left leg below the knee was cold and d; and, though the femoral pulse was easily palpable, lsation could be felt distally. The right leg was normal. heart rhythm was regular, and there were no signs of ac failure, but in view of the history it was thought ble that the popliteal embolus had come from the

ration.—The patient was seen by Sir Heneage Ogilvie, decided to attempt embolectomy. After administration travenous heparin the left popliteal artery was opened; though a length of soft clot was removed, no circulation d be established in the artery. The incision was closed and the patient returned to the ward, where he died some sixteen hours later.

Necropsy Findings.—Heart normal; no mural thrombi. When the abdominal aorta was exposed, a large osteophyte was seen projecting forward from the junction of the 2nd and 3rd lumbar vertebræ compressing the vessel from the left side. When the aorta was opened it was found to contain a thrombus which about half-filled the lumen, and over the indentation caused by the osteophyte there were small tags of organised clot from which masses had clearly broken away. At the aortic bifurcation a saddle-shaped thrombus lay, with prolongations extending a short way down the common iliac arteries on each side: the tail of that on the left side had broken off. There was moderate atheroma of the aortic wall but no calcification. No evidence was found of any occlusion of the mesenteric and renal vessels, which were clear of the thrombotic process. The left femoral artery was obstructed from 3 in. below the inguinal ligament, the clot becoming increasingly solid down to the adductor canal.

In view of these findings the doctor who had sent the patient to hospital was asked for further details of the "heart attack," which proved to have been one of complete heart-block. It thus seems probable that slowing of the blood-flow through the distorted aorta had led to the deposition of the thrombus within it.

It is interesting to compare these cases of aortic thrombosis due to external pressure with those of brachial occlusion due to cervical rib or crutch pressure described by Lewis (1936).

I am indebted to Sir Heneage Ogilvie for permission to publish this case. The drawing is by Miss Barbara Nicholson.

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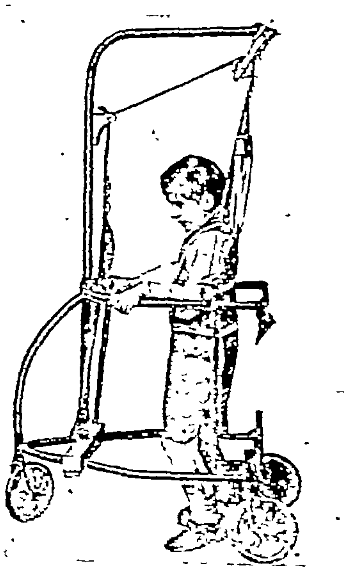
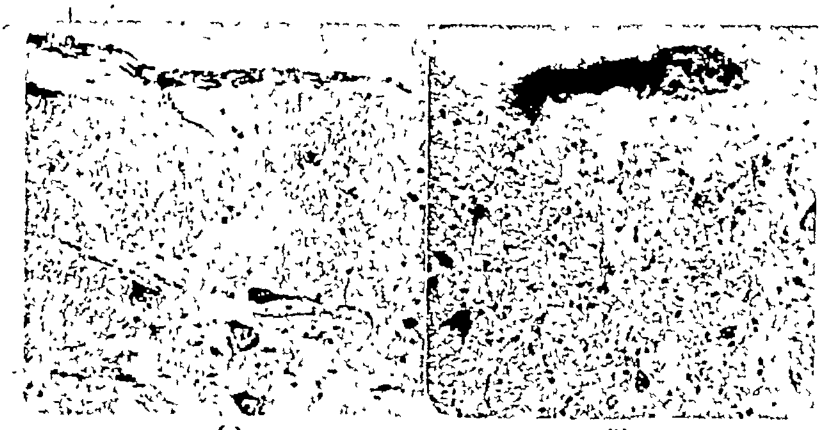
New Inventions

A WALKING-CHAIR FOR SPASTIC CHILDREN

TEACHING spastic children to walk is difficult and slow. Those who can do exercises with fair coördination while lying on their backs regain their spasticity as soon as the leg muscles take the weight of the body. The children need hours of walking practice, but neither nurses nor physiotherapists can be spared to support these children and lead them slowly round the ward for so long. The apparatus described here helps to overcome this difficulty. It consists of a walking-machine in which the child is suspended by a harness and counterbalancing springs adjusted to take any desired proportion of the child's weight.



The machine is improvised from standard hospital equipment; a more elaborate model is being designed. The post of a bed-gallows is lashed to the front of a standard walking-chair, and the lower end fixed to a wooden crossbar. A spreader to which the patient's harness is attached is hung from the gallows by a cord passing over a pulley. The cord is attached to two springs. By using different springs at different extensions the "lift" on the patient is adjusted. At first a "lift"



Sections through reticulate substance of medulla, showing increased vascular cellularity, cerebral œdema, and degeneration of nerve-cells: (a) in patient A.B., and (b) in patient C.B. (× 125.)

was passively congested with scattered areas of fatty degeneration. The spleen showed passive congestion and the malpighian bodies were prominent. The pia-arachnoid was acutely congested. The cerebral convolutions were flattened, and cerebellar and tentorial pressure cones were present. The brain was extremely œdematous. The grey matter was acutely congested, except the basal ganglia.

In C.B. large purpuric hæmorrhages were present over the lower lobes of both lungs; otherwise the post-mortem findings were identical.

Neurohistological Report (Dr. Eugen Pollak)

The neurohistological findings were the same in the two cases. There were no signs of an inflammatory lesion. Some of the blood-vessels in the cerebral cortex showed an increase of endothelial and adventitial cells. There was no perivascular cuffing; nor were any hæmorrhages seen. The most prominent feature was severe affection of the nerve-cells, which were swollen, with disorganised cytoplasm. Nissl bodies were only occasionally and faintly seen. There were signs of fatty infiltration of the nerve-cells, some of which were mere shadows. These changes were present throughout the brain, but the large cells in the reticulate substance of the medulla oblongata were most severely affected. There was a slight pericellular glial reaction.

Public Analyst's Report (Mr. Harri Heap)

Examination of the stomach and intestinal contents and of the liver in both cases revealed no evidence of barbiturate, chloral, sulphonal, alkaloid, or any poisonous metal.

Bacteriological Report (Dr. H. R. Cayton)

The material submitted for examination consisted of a bowl of meat and vegetable hash and a packet of "gravy maker." From both of these, samples were subjected to bacteriological examination, aerobic and anaerobic methods of cultivation being used. From the sample of hash bacteria were isolated only after enrichment methods, and those isolated were common air-borne saprophytes.

In an attempt to incriminate the hash as the poisonous vehicle, feeding experiments were tried, but the results were inconclusive, since only small portions of the food were eaten, and one animal died of starvation. A representative sample was then minced and a crude filtrate prepared. Four guinea-pigs were inoculated intraperitoneally with the extract, one pair receiving 1 ml. and one pair 5 ml. All the animals survived.

DISCUSSION

The simultaneous onset in two brothers of this acute illness and its identical progress suggested exogenous poisoning. The signs were not those of any alkaloidal poisoning, but the view that a heavy metal might have been responsible was strengthened by the finding of severe gastro-enteritis at necropsy. The restricted diet of A.B. before the onset of symptoms facilitated investigation of this point, since it appeared that the meal of hash was the only food which could have contained a poison. However, neither the remains of the hash nor the contents of the patients' gastro-intestinal tracts contained any poisonous substance. A month after their death it became known that the boys had eaten sweets after the hash, but investigation of the sweets did not seem likel to be profitable after such a delay, sinc no-one else appeared to have bee affected.

A.B. had a throat infection when was taken ill, but C.B. was in goo health, so an endogenous bacterial toxi could not have been to blame.

The cases occurred at the end an epidemic of poliomyelitis, but th simultaneous onset of poliomyelitis two brothers was thought improbable nor were the findings in the cerebrospin fluid in favour of this diagnosis. Fulmi ating polioencephalitis could not, ho ever, be excluded clinically, and it worth noting that a clinically similar ca which occurred at another hospital in th area during the same week was prov histologically to have been a typical case of poli encephalitis.

There remains for discussion the acute toxic encephal pathy of unknown ætiology first described by Anders (1923) and later by Brown and Symmers (1925), Bra and Hunter (1929), and Baker (1935). This diagno can only be finally established histologically. The his logical differentiation of non-suppurative encephalitis infectious origin and of toxic encephalopathy is discus by Hassin (1921), Grinker and Stone (1928), and L (1930), and the following criteria are laid down:

(1) In infective cases there is infiltration with mesoderm elements, producing perivascular cuffing and perhaps par chymatous infiltration, whereas in toxic cases there is no su infiltration.

(2) In toxic cases there is a proliferative reaction of t local vascular system. There is new vessel formation a stimulation of endothelium, with obliteration of ma capillaries—the so-called endarteritis productiva.

(3) In toxic cases there is particularly severe affection the ganglion cells which commonly takes the form of se liquefaction. Severe neuronal change may, however, seen in polioencephalitis, but it is then accompanied mesodermal infiltration.

The changes in toxic encephalopathy are sim whether the condition is caused by bacterial toxins, in diphtheria, pneumonia, septicæmia, erysipelas, scar fever, and dysentery (Ford 1937), by heavy metals, suc as lead, arsenic, and manganese, or by unknown toxi

The essential neurohistological findings in the prese cases are the absence of mesodermal infiltration and th presence of cellular liquefaction and slight vascul proliferation. These findings exclude polioencephalit or any other form of non-suppurative encephaliti Since the analytical and bacteriological reports did no reveal any known neurotoxin, the diagnosis is acut toxic encephalopathy of unknown ætiology.

SUMMARY

An acute cerebral illness developed simultaneousl in two brothers, aged 17 and 12, who died within forty eight hours.

Histological examination showed features characteristic of acute toxic encephalopathy.

The responsible toxin was not traced.

It seems that no report has previously been published of acute toxic encephalopathy of unknown ætiolog occurring in one family or in one household.

I wish to thank Prof. Crighton Bramwell, under whose car the patients were admitted, for his help and guidance in the preparation of this report; Dr. Fergus R. Ferguson, who examined the patients in consultation; Dr. W. Susman, for the necropsy; Dr. Eugen Pollak for neurohistological, Dr. H. R. Cayton for bacteriological, and Mr. Harri Heap for analytical report

References at foot of next page

THE LANCET

LONDON: SATURDAY, NOV. 20, 1948

A Symbol Reborn

HE intrinsic instability of human society is so ming that every community is obliged to develop e means whereby the forces of cohesion are brought a focus. In this country the focal point, which taken centuries to evolve, is a constitutional archy. We in England may take pride both in Royal Family and in our attitude towards it. In King we have a representative of a father, a father grown-up family, who receives the affection we owed on our own father in childhood and the ect we pay him in our adult years—a father who s up with his children. With us he is no distant re in shining armour, nor is he cut off from us by e cordons and armour-plate glass as other leaders cent years have been. Both he and we live within framework; we are constitutional subjects as he constitutional monarch. Both he and we are tied nds of family relationship: and a family is not group which can give the highest expression tisfaction to the sentiments of affection; it a bridge over the generations—a bridge that the chasm of the grave and thus performs a function no less important than the biological. the Royal Family we find a nucleus for our onal sentiments; being in an equal relation to it can all identify ourselves with each other in the mon direction given to our good regard. That ily is also a model we can copy, and in its human pleteness we can find some compensation for failures. It is refreshing that in a world split into ological camps, divided by forceful though usually llow doctrinal views on the pre-eminence of the nomic basis of human associations, we can without ying the importance of these issues discern their ted relevance, and feel our way to a wider under- ling of our personal and social life. Party factions go on to the end of time; by the wisdom or lance of the people, Governments will continue fall and be replaced by others, destined in their n to be dismissed; and a healthy discontent will s find outlet for our divided feelings towards the tral authority. But always we have in our Throne outlet for affection, which, while untouched by rty strife, touches our profoundest feelings.

With our King and our Princess we rejoice in the rival of a new generation in Our Family. Four erations now span the slowly changing customs our time, and a new arch has been added to the idge that joins our past to our future.

Maternity

A SURVEY of the social and economic aspects of pregnancy and childbirth, produced jointly by the Royal College of Obstetricians and Gynæcologists and the Population Investigation Committee,[1] draws attention to the uneven working of our maternity services—to variations in antenatal care and in care during confinement, to shortcomings in some nursing-homes and hospitals, to the cost of attendance and of baby-clothes and equipment, and to unnecessary and unrelieved pain. It is based on an inquiry made by the health visitors of 424 maternity and child-welfare authorities (92% of all such authorities in England, Wales, and Scotland). The mothers of all babies born during the week March 3–9, 1946, were visited eight weeks after delivery, and interviews were completed with 90% of them. In all, 13,687 mothers helped by answering questionaries, 7287 of them on the availability and use of the maternity services, and 6400 on the medical and other costs associated with the birth of their children.

All sections of the community, it seems, make use of antenatal clinics, and the pregnancies of no less than 73% of women were supervised under local-authority schemes—54% at clinics, 5% by general practitioners working for local authorities, and 14% by municipal midwives. But "even in the most favourable conditions" less than half the mothers attend during the first three months of pregnancy, when antenatal supervision should begin if it is to have its best chance of preventing premature births and neonatal deaths, and of promoting breast-feeding. The committee regret that few local authorities take much trouble about advertising their antenatal services or encouraging women to attend early; and women may be actively discouraged by unsuitable premises for the clinic, and by the lack of an appointments system, which makes a visit awkward for multigravidæ who have to find someone to mind their children in their absence. Further, the standard of antenatal care is by no means always high. The committee points out that, if a doctor is consulted at every visit, the abnormal side of pregnancy may be emphasised; moreover, the midwife is deprived of the interesting part of her work at the clinic and loses authority when she comes to deliver the mother. But a more serious objection is that the doctor's examination—doubtless because he has other things waiting to be done—is apt to be hurried and inadequate. At one clinic visited the doctor had seen 29 women in 80 minutes, and at another he was over an hour late. In this second clinic the waiting-room was small and overcrowded and equipped with wooden benches. One mother complained that it is very trying, towards the end of a pregnancy, "to sit on a hard chair in an antenatal clinic for $2^1/_2$ hours waiting to be seen."

The difficulty of finding someone to look after the older children may prevent a mother from going to hospital to have her baby, even though her own home is unsuited to the purpose. "Many confinements," the committee found, "take place in appalling conditions of overcrowding." This does not appear to increase the actual risks of delivery, and of about two-thirds of the body-weight is used; this is lessened as coördination improves. The harness is made of 1 in. lamp-wick, the joins being sewn with linen thread, and buttons and holes being used for fitting. Three bands pass round the body—at the chest, waist, and hips—and are joined by two vertical ones at the front and two at the back, prolonged below to make groin straps and above to fasten to the spreader. This harness is buttoned over the clothes and can be worn for a long time with comfort.

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[1] Maternity in Great Britain, London: Oxford University Press. 1948. Pp. 252. 12s. 6d.

Experience suggests that the device is of most value in the first walking exercises and in the more severe cases; in the milder cases the only advantage is that the child is more confident, since he cannot fall and hurt himself. The very severe cases, which would otherwise be bedridden (the child in the photograph was one), can use the device to walk about unattended, visit other children, and take the air in the hospital grounds. The difference which this makes to such a child can well be imagined.

I am grateful to the medical superintendent, Cherry Knowle Emergency Hospital, and Mr. D. G. W. Brown, visiting orthopædic surgeon at this hospital, for encouragement in developing the device, and to Sister D. Armin, who made the harnesses and spends many hours a day teaching the children to walk.

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Darlington.

Reviews of Books

Textbook of the Rheumatic Diseases

Editor: W. S. C. COPEMAN, O.B.E., M.D., F.R.C.P., physician to the rheumatism department, West London Hospital. Edinburgh: E. & S. Livingstone. 1948. Pp. 600. 50*s*.

Now that the rheumatic diseases are increasingly recognised as a suitable basis for special practice, and also as a subject urgently needing more special study, the appearance of a new and authoritative textbook is welcome. As editor of this volume, Dr. Copeman set out "to collect and collate modern knowledge of the rheumatic diseases from the best sources," and the resulting symposium, representing as it does the combined efforts of 24 contributors, can be regarded as a success. Modestly restricting his own contribution to chapters on non-articular rheumatism and chorea, the editor sets a high standard which is well maintained by his collaborators. The chapter on rheumatoid arthritis by Prof. L. S. P. Davidson, those on gout and the rarer arthritic syndromes by Prof. Henry Cohen, and Dr. Ernest Fletcher's account of osteo-arthritis, are in themselves sufficient to justify the book. The two chapters by Dr. J. H. Kellgren on pain, and that by Dr. Percy Stocks on statistics, although primarily for research-workers, are of general interest, while the essay on rheumatic fever by Lord Horder is a model of graceful writing. It is much to the credit of the editor that in a book that includes contributions from specialists in neurology, psychiatry, physical medicine, orthopædic surgery, and pædiatrics, as well as from general physicians, there is hardly any overlapping. There is, moreover, a striking uniformity of approach: large gaps in our knowledge of the ætiology of almost all the rheumatic diseases are frankly admitted, while the current empirical treatments are critically assessed. The book is well printed and lavishly illustrated, and its value as a work of reference is enhanced by an excellent index.

Congenital Malformations

(2nd ed.) DOUGLAS P. MURPHY, M.D., F.A.C.S., assistant professor of obstetrics and gynecology, University of Pennsylvania. Philadelphia and London: J. B. Lippincott. 1947. Pp. 127. 30*s*.

A SURPRISINGLY high proportion of pregnancies terminate in malformed offspring. Gynæcologists have become more interested in the subject since more has been learnt about some of the fœtal pathological states—such as icterus neonatorum, and the effects of maternal rubella. But a large proportion of fœtal abnormalities remain unaccountable. Professor Murphy was one of the pioneers in this field, in the early 1930s, and a summa of the results of his Philadelphia surveys on the incide of causes of malformations was first published in 19 This enlarged edition, now easily available to Brit readers, is welcome. He finds that the frequency gross malformation is 0·5% of all births, being higher white than in coloured populations; and his analysis the incidence in relation to maternal age and par reveals a significant excess among the later birth though the description of the statistical methods u is far from clear. No relationship was found betw maternal ill health or nutrition and fœtal dise though the data are remarkably abundant. The j position of cases of known recessive diseases with m formations of quite different origin, and the cr treatment of the problems of familial incidence, n trouble genetically minded students; and the failure discriminate between these different groups makes s of the generalisations unsound, especially those rela to prognosis for subsequent pregnancies. But the so what dogmatic approach may have the effect stimulating readers to make further inquiries in hitherto neglected field; for Professor Murphy's acco is not so much a textbook as a concise account of pio researches. Two brief new chapters on mate pelvic irradiation and on maternal rubella add to usefulness.

Reid's Practical Sanitation

(24th ed.) Revised and rewritten by JOHN J. BUC M.D., D.P.H. London: Charles Griffin. 1948. Pp. 300.

"Reid" appeared first in 1892, and between that and 1937 achieved 23 editions. This new one has entirely rewritten by Dr. J. J. Buchan, formerly me officer of health for Bradford. Reid wrote his boo sanitary inspectors; but it was, and is, also pre-emine suitable for medical students of hygiene, since two-th of it deals with practical sanitation and the remai third with sanitary law. This edition contains littl what Reid said 50 years ago, but justly retains his n because it retains his object—to provide an introduc to the study of sanitary science.

Principles and Practice of Modern Cosmetics (Vo Cosmetic Materials. London: Leonard Hill. 1946. Pp. 35*s*.).—Mr. Ralph G. Harry, dealing with the subst employed in pharmaceutical and toilet preparations, co a wide range of drugs and inorganic and organic mat giving synonyms, formulæ, molecular weights, occurr nature or method of manufacture, physical and ch properties, *B.P.* standards, method of use in toilet prep tions, and dermatological action. He has a compreh knowledge both of chemistry and of modern literature dermatological topics, and his opinions are stated with ambiguity or confusion. The book can be strongly rec mended as a work of reference for those interested in cosmet

Vaccination par le B.C.G. par scarifications cutan (2nd ed. Paris: Masson. 1947. Pp. 115. Fr. 180)—T monograph, by Dr. L. Nègre and Dr. J. Bretey, of Pasteur Institute, Paris, opens with a short historical rev of Calmette's earliest work on B.C.G. vaccination from 1 onwards; and this is followed by an experimental laborat study, on guineapigs, rabbits, calves, and a chimpanzee, modern methods of application of the vaccine by the multi puncture and skin-scarification techniques, as introduced Rosenthal and as studied in detail by Birkhaug and others Scandinavia. These techniques avoid, to a great extent, t annoying cold-abscesses which resulted from subcutane inoculation. The book ends with a short clinical review prophylaxis in man, including a summary of the well-kno work of Heimbeck and others. The microscopical study sections of the skin of animals after the application of t puncture and scarification techniques is instructive; the show agglutination of the bacilli in the subcutaneous tissu within a few hours, followed by exudation of plasma a phagocytic reaction. In laboratory animals these reactio resulted in positive Mantoux reactions in 1–4 weeks. The is little new in the monograph; indeed, it would be diffic to be very original nowadays on this subject; but it is a cle presentation written with the usual French lucidity, and a tribute to the work of the authors' late colleague and teach Albert Calmette.

others, has strongly deprecated the introduction regional training councils to look after the training nurses, and the removal from regional boards and nagement committees of all direct responsibility, ministrative or financial, for such training. Never- less the advantages of separate financing of cation have long been obvious,[1] and we welcome Government's move in this direction, which is doubtedly wiser than any attempt at sudden orm of the nursing curriculum. It must be recog- ed, however, that the whole conception of student tus, which has so long dominated serious discussion, pends on the hospitals being able to recruit and in enough trained staff; for otherwise the dents' training is likely to be modified to meet er needs. The facts about loss of trained staff ch King Edward's Hospital Fund has collected, which we lately published,[2] show that much e attention will have to be given to this part of problem.

heir Lordships were right in thinking that fficient remuneration is not a primary cause of the sent difficulties. Nevertheless the pay of the ined nurse is still on the agenda, and the recent ision of the arrangements for student nurses erlines the necessity for a new approach to the ngements for those whose training is complete. the nurses state their own case with enough our? The Royal College of Nursing has been sulting its branches; and the salary it now gests for the newly qualified staff nurse, says the sing *Times* of Nov. 6, "is £260 per annum, g by £15 to £320, while the newly appointed sister starts at £310 per annum and rises by nnually to £430, and can by subsequent long- increments, reach £470." At first glance this seem reasonably satisfactory; but it appears after residence and other statutory deductions been taken into account, the staff nurse's initial income will be but £115, and that of the ward sister . The *Nursing Times* optimistically hopes that "will enable them to enjoy those cultural and re pursuits so necessary for the balanced and able citizen of today, and will help to lessen the r of financial anxiety on retirement." Of course, the nurses do not ask for more, it is improbable t they will get it; but those in other professions surely wonder whether it is enough. As a corre- ondent argued in these columns some time ago,[3] n the student nurse needs £100 a year, over and ve residence, to meet her current outgoings on hes, a modest allowance for holidays, and so on. Government have since advanced towards this w: an allowance of about £200 per annum is now de to the student nurse as to various other tegories of resident trainees, and after the deduction residence, superannuation, income-tax, and other ligatory payments, she has about £75 a year for her rsonal expenditure. The question arises whether, the trainee is recognised to need £75 for this purpose, is sufficient to start the qualified staff nurse at figure that will give her only £40 more. She is now qualified and skilled worker, earning her own living, ho ought to be in a position to give a little help at home if necessary and put a few pounds in the savings bank. True, her salary will slowly rise; but if she continues to work as a staff nurse, is she never to get more than £320 gross, which is £10 less than the newly qualified almoner who starts at £330? Something has surely gone wrong with the way in which these figures have been worked out: perhaps the picture has been confused by an attempt to keep the hospital nurse in relation with the non-resident health visitor or industrial nurse. The outsider would suppose that the staff nurse should receive at least £100 a year more than the trainee, and the ward sister more in proportion. It would be a pity if the prospect of getting and keeping more trained nurses were to be seriously prejudiced by too conservative and too self-effacing an approach on the part of the nurses themselves.

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[1] *Lancet*, 1947, i, 803, 835.
[2] *Ibid*, Aug. 14, p. 266.
[3] *Ibid*, 1947, i, 190.

Annotations

THE PLACE OF ELECTRO-ENCEPHALOGRAPHY

As soon as the electro-encephalograph was accepted as a useful tool in the hands of the clinician, it was introduced into departments of neurology and psychiatry throughout the United States. Now, with a lag determined by our conservatism, lack of opportunity, and the war, the same thing is happening here. Of course, every neurological or pyschiatric unit in this and every other country should have access to an electro-encephalograph, and, if it can employ it fully, should have its own; for there is no doubt that the apparatus can give information which is not to be had otherwise. With it, for instance, the different forms of epilepsy can be recognised, and treatment consequently determined. With it, also, the area of abnormal brain can be assessed, and even the severity of brain damage judged in patients who have local brain lesions. A final answer may be given to the suspicion that a brain abscess is present, or that late epilepsy is due to a tumour which has not yet caused any other symptoms or any signs.

But the trouble is that an electro-encephalograph is worse than useless without trained people to interpret its results, however many channels it may have and whatever its fidelity in recording. Two kinds of people must serve it—the recording technician who transfers the electrical activity of the brain to paper, and the physician who interprets the record and integrates the results with the other clinical evidence. This physician should be a trained neurologist or psychiatrist and he should also have considerable knowledge of electro-encephalography—its physics, physiology, and clinical application. A factual description of a record given by a technician, physicist, or physiologist rarely helps the clinician at all, and a clinical opinion upon the record given by a physiologist may mislead him, for he is impressed by the spurious objectivity of the report, which seems to him more securely based than his own opinion. It is quite essential, therefore, that an interested clinician should be available and trained before any institution sets up a department of electro-encephalography.

Jasper,[1] in his presidential address to the American Electro-encephalographic Society, outlines the development of the subject and draws attention to the present trend towards mediocre departments of routine investigation, from which little original work comes. Most of the work has been dull descriptive stuff, far removed from the fundamental investigation needed in so young a branch of physiology. He points to the limited extent of our knowledge of the physics of "brain waves" and of the physiological processes that determine their indeed home delivery carries a low risk of stillbirth and neonatal death; but appearances are here deceptive, for about half of those originally booked for home delivery are finally admitted as unbooked cases to hospital, and among these the rates for stillbirth and neonatal death are very high. It seems that many women would prefer to have their babies at home, if they could have better homes and some help in them; but the majority would probably be glad to take the chance of getting away from their household cares for a week or two if they knew that all was well at home. At present, of course, there are not nearly enough beds, and many of those that exist are badly understaffed. The result is that women are often left alone for long periods during labour—a frightening experience which they would almost certainly avoid at home. The committee urge the need for more hospital staff, more domestic help, and better housing—agreeable commodities, but remote. It would be more constructive perhaps to consider in detail ways of using our present staff and accommodation to better advantage.

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[1] Jasper, H. H. *Science*, Oct. 1, 1948, p. 343.

Many will be surprised to hear that only 5% of mothers confined at home, and only about half those confined in hospital, were given analgesia. Midwives are now allowed to give gas-and-oxygen with the Minnitt apparatus provided another person, acceptable to the patient, is present; but only since 1946 has their course included training in this method. During the preceding ten years practising midwives were so few that it was impossible to release many of them for such training, and in 1946 only one practising midwife in five held a certificate of proficiency. Fortunately the position has now improved; for the Central Midwives Board's latest report shows that, up to March 31 last, 6137 midwives had taken the board's certificate, while a further 4725 held certificates from other bodies. In addition to the Minnitt apparatus, midwives are nowadays trained to use the Walton-Minnitt, the Amwell, the Jecta, and the Talley gas-air apparatuses, and the board is anxious to make them proficient in the use of as many methods of relieving pain as the Royal College of Obstetricians and Gynæcologists approve. The great drawback to gas-and-air methods is the weight of the apparatus. It is too heavy to be carried conveniently on a bicycle, and some local authorities will neither provide a midwife with a car nor allow her a mileage or maintenance allowance if she uses her own. Some which will not provide a car arrange to have the apparatus delivered by ambulance at the mother's house, but others refuse even this service on the ground that it would encourage the midwives to ask to be taken to the confinement in the ambulance themselves! Also the Minnitt machines are still scarce, though supplies are improving; and even those in hospitals may be out of order and hence never used. To provide analgesia means a little extra trouble, which midwives may be unwilling to take unless the mother insists; and in some hospitals this difficulty has been overcome by requiring the midwife to state the reason why she has *not* given analgesia.

As might be expected, analysis of cases shows that certain groups of women are much more likely than others to have their pain relieved. Thus 48% of the women attended by doctors had some form relief, compared with only 7·6% of those attende by midwives. Again, the wives of salaried ar professional workers are almost twice as likely to given analgesia as the wives of agricultural worker *Primiparæ* are more likely to be relieved than mult paræ; but, even so, only 31% of manual worker wives were given analgesia for their first confin ment, compared with 63% of the wives of salari and professional workers; while unmarried mothe come off particularly badly, only 20% of the confined at home getting analgesia. (This is large because they seldom engage a doctor, and often bo a midwife only a few days before the confinemen In view of these findings it is not surprising th among complaints made by women dissatis with their treatment during labour lack of analg was the commonest. Yet here is a form of pain wh can be predicted with certainty, and diminished w very little trouble. It serves no useful purpose, a may even deter some women from childbearin King Edward's "if preventable why not prevente applies here with uncomplicated force. The Natio Health Service gives all authorities the chance raise their maternity services to the standard of best, and here is a straightforward issue which t could tackle without delay. At present the wo who happens to be better off is getting preferen treatment.

Nurses and Their Pay

It is good to see that less emphasis is now bei put on the "shortage" of nurses and more on t proper use and proper training. In his lucid con bution to the Lords' debate reported on another p Lord Crook dwelt on the steady increase in number of nurses: 7000 more are employed tha year ago, and 31,000 more than in 1938. "What t public fail to realise," he said, "is that over t last half of a century the nursing service has gr right out of its former relation with the growth of t population . . . but the greater part of the growth h been due rather to the new conception of social c and welfare upon which Parliament and the State a whole has embarked.". Today there are 2500 sch nurses, and we are faced with a demand for so 8000 health visitors; there are the district nurs and also the nurses in industry, whose number ri to a peak of 7000 during the war. If hospitals to secure enough nurses to serve their increasi purposes they will have to alter some of the ol ideas about the abnegation of personal freedo they will have to reduce the domestic duties n devolving on the nurse; and they will have introduce a shift system—wisely commended hospital management committees in the latest re book issued by the Ministry of Health. From t many suggested remedies for our present difficulti Lord Crook made a perspicacious selection.

The debate also gave an inkling of what the Govern ment have in mind for their promised *Bill*. The evident intention is to separate responsibility f training nurses, on the one hand, and for providi nursing services on the other. The wisdom of th policy is already being challenged, and the South East Metropolitan regional hospital board, support roved school for stealing, who later went to a borstal titution for the same offence, and still later was peatedly imprisoned for stealing, getting longer and nger sentences, adding violence to theft as time went , and at last being dubbed in the archaic legal phrase "an corrigible rogue." Surely such a case may be considered failure for legal methods of treatment; and if this is at such methods can do, surely psychiatrists are titled to demand the right to help. A body of psychia-ists investigating legal procedure might consider better ethods of selecting magistrates, the ways in which the ws of evidence are used to suppress facts, the ability of ries to decide on expert points, and the anomalous osition in which experts giving evidence are sometimes aced. It would be better, he suggested, if experts were lled by the court, and cross-examined by the advocates both sides, instead of being called by one side and tacked by the other. Psychiatrists who offered to vestigate criminal procedure would naturally be much ticised by the lawyers; but the large numbers of the idivists produced under our present system would t them in a strong position. British legal procedure a high reputation for justice, but he believes it places o high a value on advocacy. "A trial is too much like sporting contest, both sides observing the Queensberry les, with the bench as referee."

ANTICONVULSANT ACTION OF INTRAVENOUS PARALDEHYDE

PARALDEHYDE has long been used as a soporific and an anæsthetic, but its use as an anticonvulsant is t so widely known. In 1919 Wechsler, of New York, ter trying without success many known remedies to ntrol convulsions in a hyperkinetic case of epidemic cephalitis, had recourse in desperation to intravenous raldehyde, the effect of rectal paraldehyde having oved merely transient, never lasting more than a rter of an hour. The intravenous dose was 1 ml., "by the time the last drop was injected, literally e the needle was withdrawn, the patient quieted and promptly fell asleep."[1] The first injection ng proved successful, other injections of 1 ml. were n at various intervals each day for several days, and patient recovered without sequelæ. The outcome Wechsler to adopt this treatment in other cases of otracted convulsions, including status epilepticus. s results were various, but he concluded that intra-enous paraldehyde was valuable in generalised epileptic izures though liable to fail in convulsions due to gross ganic change in the brain—e.g., tumour, subdural matoma, and dementia paralytica.

The next uses of intravenous paraldehyde seem to ave been as a 2–5% solution as an anæsthetic for short perations[2] and in a dose of 0·1–0·2 ml. per kg. of body-eight to induce anæsthesia for longer operations in hich anæsthesia was subsequently maintained with her.[3] No further work seems to have been described ntil the experiments on animals and clinical trials made y de Elío and his colleagues in Madrid, which were eported at the Dublin meeting of the Society of British Neurological Surgeons this year and have now been published.[4] They found by electro-encephalography that both in the cat and in man intravenous paraldehyde in doses of 0·2 ml. per kg. of body-weight either much reduced or abolished the motor activity of the cerebral cortex. Convulsions caused by neurosurgery stimulating the cortex and convulsions induced with leptazol were immediately abolished. Intravenous paraldehyde also protected animals against the effect of large doses of strychnine. This anticonvulsant action was observed even in decerebrate animals, spinal preparations, ganglionic synapses, and peripheral nerves, but its main action was on the cerebral cortex. In patients undergoing electric convulsion therapy intravenous paraldehyde raised the threshold of stimulation. No toxicity was observed with intravenous paraldehyde given in the recommended dosage.

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[1] Wechsler, I. S. *J. Amer. med. Ass.* 1940, **114**, 2198.

[2] Bastedo, W. A. Materia Medica, Pharmacology, Therapeutics and Prescription Writing for Students and Practitioners. Philadelphia, 1932.

[3] Nitzescu, I. I., Iacobovici, I. *Pr. méd.* 1934, **42**, 331.

[4] de Elío, F. J., de Jalón, P. G., Obrador, S. *Rev. clín. esp.* 1948, **30**, 289.

INSTITUTE OF OPHTHALMOLOGY

AT the formal opening of the Institute of Ophthalmology on Nov. 4, a distinguished gathering, presided over by the Earl of Rothes, chairman of the board of management, listened to addresses by Sir John Parsons, F.R.S., the doyen of British ophthalmology, and by representatives of the New and Old World—Prof. Alan Woods, of the Wilmer institute of the Johns Hopkins University, and Prof. H. J. M. Weve, of the University of Utrecht. Under the direction of Sir Stewart Duke-Elder, the institute has been formed by pooling the resources of three London eye hospitals—Moorfields, the Royal Westminster, and the Central London. The last-named now forms the institute itself, and the beds so lost will be made up by increasing those in the other two hospitals. The institute will have the twofold function of research and teaching. Full-time research-workers are housed there in well-equipped laboratories, while clinical research will be carried on by the segregation of special types of eye disease and their routine examination by ophthalmic surgeons within the building. Courses are held for the D.O.M.S., and for the F.R.C.S. in ophthalmology, including practical instruction in operative techniques and laboratory methods.

On the same day, at an inaugural dinner, Sir Stewart Duke-Elder said that while the institute was not everything to be desired it marked a half-way house, or at least the end of the beginning. At last there was a place in London, away from the rush of hospital outpatients, where original work in ophthalmology could be done and where the scientific method could be practised.

SPECIALIST APPOINTMENTS

STATEMENTS about the shortage of specialists are heard with exasperation by the many young men who have trained for specialist employment but cannot find it. They complain that very few appointments are now being offered, and that meanwhile they and their families can hardly make ends meet. Under the National Health Service, they feel, this state of affairs should have ended: the hospital boards should be advertising a great many new posts to fill obvious deficiencies in their service to the public; or at least they should make temporary appointments. But the truth is that the boards can do nothing effective of this kind until they have reviewed their existing staff and have decided what their new establishment ought to be. The review has to be completed before April 1 next, since the new contracts are to run from that date.

The Ministry of Health advises[1] the boards to begin by considering the proper establishment of non-specialists (house-officers, registrars, &c.). "They should then consider how far the services given by the present specialist staff need modification to provide an adequate hospital service—e.g., whether further part-time service or additional whole-time posts are required, whether duties should be continued or redistributed."

> "In the same way boards should consider and determine the requirements for other medical and dental staff—e.g., consultant advisers to regional boards; general practitioners acting as medical officers of convalescent homes, &c., or as clinical assistants; general dental practitioners acting

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[1] Ministry of Health Memorandum RH 13 (48) 83, BG (48) 71.

presence, and then he goes on to suggest many ways in which this knowledge could be increased. There are now societies of electro-encephalography in several countries and a journal will appear next year. But Jasper has found—and others in the States and in England will agree with him—that the volume and quality of original work has been disappointing. "Instead of representing a stimulus to more intense fundamental investigation, clinical applications have drawn us away from basic research. . . . The outcome has been a number of pseudo-scientific clinical investigations which have served only to burden editors and readers of scientific journals without providing a great attraction to more serious minded investigators concerned with the fundamental aspects of brain function." There appears, therefore, to be danger of criticism from two sides—the clinical and the physiological—presumably because the subject has a difficult position within both fields of work. The solution may lie in the use of a team, consisting of physicist, physiologist, and clinician, as well as the group of technicians. Such a unit would be far beyond the needs of most institutions, but it is necessary if the standard of work is to be maintained at a high level and if knowledge is to be increased. Even if most units are necessarily smaller than this, each should include a well-trained clinical worker who has knowledge of physiological method and who at least can work in close touch with academic physiologists.

CEREBROVASCULAR ACCIDENTS IN HYPERTENSION

THE precise nature of vascular accidents to the brain in hypertension is sometimes certain and at other times obscure. With the classical cerebral hæmorrhage or thrombosis the clinical picture is usually unmistakable, and the pathogenesis beyond question. A larger group of cases is characterised by transient paralysis, paresis, aphasia, or amaurosis. Such a syndrome, now known by the generic title of hypertensive encephalopathy,[1] may take an acute or chronic form. Acute encephalopathy occurs with the hypertension of acute nephritis and of toxæmia of pregnancy, and with acute exacerbations of chronic hypertension. The attacks, consisting of severe headache, drowsiness, vomiting, and convulsions, may be preceded or followed by focal cerebral signs which usually leave no stigmata in those who survive. Volhard's original suggestion that the immediate cause is acute œdema of the brain is now generally accepted; but it is still undecided whether this œdema is due to excessive or defective arteriolar constriction. The principal features of encephalopathy in chronic hypertension are its brief duration and the completeness of recovery from motor or sensory disturbances; there is, as a rule, no loss of consciousness. It has long been held that the disturbance is due to localised spasm of the cerebral arterioles. Pickering,[2] however, now postulates that it is the outcome of embolism or thrombosis. Cerebral arteries, he points out, have exceptionally thin walls, and the media of cerebral arterioles contain relatively little muscle tissue. This anatomical evidence against contractility is supported by physiological evidence of difficulty in producing vasoconstriction by either adrenaline or stimulation of the cervical sympathetic fibres. Pickering draws attention to the similarity of the cerebral syndrome in hypertensive encephalopathy with that in cerebral embolism due to mitral stenosis and auricular fibrillation. In both, he suggests, the mechanism is the same—namely, sudden organic occlusion. In hypertensive encephalopathy the eventual state varies between complete recovery and persistent paralysis. At the latter end of the scale thrombosis or
embolism has always been acknowledged as the ca
He believes that the termination of transient disturba
is due to dislodgement of the embolus from a m
artery ; where the disturbance, though still tempor
is more protracted the embolus or thrombus may bec
canalised or collateral circulation develop.

Pickering's explanation—like others—is still lar
based on hypothesis. But he is on firm ground in claim
that his suggestion "violates no cardinal principle
vascular physiology and is in harmony with the pathol
of hypertensive disease."

THE CRIMINAL AND THE BENCH

"WRITE and tell him what you think of him, by
means," was the advice of an editor to a junior,
angry, member of his staff; "but don't send the le
The same principle might be followed in courts of ju
Mr. Claud Mullins, giving the Maudsley lecture of
Royal Medico-Psychological Association on Nov. 12,
sidered it a weakness of our judicial system that sente
are usually passed within a very few minutes of
verdict being reached. Judges should be beyond emot
yet some crimes, notably sexual offences, excite unrea
able anger in many people; and though it is unforg
able, he said, to pass a sentence in anger, some crimi
appear so unrepentant and defiant that magistr
recorders, and even judges may be forgiven if they
them hateful. With even a smattering of psychi
knowledge, however, judges could recognise
behaviour as a defensive reaction. The judge who
his opinion of a prisoner by watching his conduct at
trial could hardly engage, Mr. Mullins suggested,
more dangerous practice; and the lawyer who
"I can tell a rogue as soon as I see him" is decei
himself: it simply cannot be done. The rule of pas
sentence directly after the verdict has another drawb
it gives the magistrate no opportunity of getting fur
information about the prisoner—unless, indeed,
information is obtained before the trial starts.
the prisoner is presumed innocent until he is pr
guilty this too presents difficulties. Children and y
people convicted of crimes are remanded while
are made; and it might be wise to remand adult p
in the same way.

Early in his career as a magistrate, Mr. Mullins be
to have doubts about our traditional methods of dea
with criminals; and he took the trouble to learn so
thing of abnormal psychology, and to arrange
psychiatric treatment of convicted criminals who
willing to accept it. He has even managed to
some who had been acquitted for lack of evide
to accept treatment. The results were encourag
especially with some sexual offenders, notably exh
tionists. He realises that such patients are not necess
cured by psychiatric treatment: but they often give
behaving in a manner which is dangerous or annoy
to others and so brings them into conflict with the l
Psychiatric treatment is not necessarily an alternat
to punishment, he considers; indeed, wise punishm
can satisfy a criminal's unconscious needs, and sho
have his approval. Unfortunately in a high proport
of cases the punishment is related to the crime, not
criminal. The new Criminal Justice Act gives expr
powers to the courts to arrange for a medical inqu
into the prisoner's case, provided he consents; but t
is a practice which has been followed in enlighten
courts for a long time. Whether or not the Act
bring better conditions depends on the willingness of t
courts to use their powers. Psychiatrists, he suggeste
must do what they can to form a body of public opini
favouring methods more likely to induce a change
attitude in the prisoner, and hence greater protect
for the public. He quoted the case of a child sent to

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1. Oppenheimer, B. S., Fishberg, A. N. *Arch. int. Med.* 1928, 41, 264.
2. Pickering, G. W. *J. Amer. med. Ass.* 1948, 137, 423.

fects mental growth as a whole, or whether it limits neral intelligence.

Even the accepted behaviour of a group, Dr. Blackburn ds, influences test results. Tests based on language e done better, other things being equal, by those th a family tradition of literacy than by those ose interests are directed elsewhere. English-American ildren are used to competing for success, and come the test prepared to do their best. North American dians have no tradition of trying to do better than other ople, and in some tribes no opinion is given on any estion until a unanimous decision has been reached. another tribe it is bad manners to reply to a estion to which someone else in the company does t know the answer. Sometimes there is a rule that member of the tribe should never reply unless he can certain of his facts. Such high standards of manners d accuracy defeat the test situation, and rule out all ance of scoring on the lucky guess.

Again, people who take large numbers of tests, like se who make a hobby of crossword puzzles, develop ight into the way the setter's mind works, and re accordingly. Intelligence scores of recruits in the erican army in the 1914–18 war showed a high sitive correlation with the educational efficiency in e States from which the men came.

Nor are results uniform with different tests: the same oup may differ by as much as 12 points in two different ts. If two groups give different results when tested th the *same* test, then it may be that one group was ighter than the other; but, as Dr. Blackburn points t, it may equally be that the test was better suited the successful group. Finally, the I.Q. in identical ins brought up in the same environment differs on average by 6 points: but who can say whether this veals a difference in the twins or a flaw in the measuring-pe? The twins, with shared genes and experience, perhaps a better measure of the test than the test of the twins.

Dr. Blackburn suggests that comparisons between the s of different groups are unreliable, and that much experiment is needed before tests should be used y wide scale for job selection.

FACTS ABOUT THE TSETSE

It has been justly observed that the tsetse still governs ge areas of Africa; in Nigeria, with a population of million, half a million cases of trypanosomiasis have en treated during the past fifteen years. Some time o the Colonial Office's trypanosomiasis committee ppointed three investigators—Mr. T. A. M. Nash, sc., Prof. T. H. Davey, M.D., and Prof. P. A. Buxton, R.S.—to report on the incidence, and effects, of the tse fly in East and West Africa. Of their reports three[1] e obtainable now, and a fourth[2] will be on sale soon.

Action has already been taken on these reports, which ere completed in 1946 and 1947. Thus in West Africa research institute is being set up, while in East Africa director of research and reclamation has been appointed. erhaps the chief value of these accounts is in providing comparative picture of conditions in the various lonies. This picture is certainly grim enough. In igeria, for example, only a fifth of the country is really afe for man and his cattle, and a third is an endemic eeping-sickness area. The tsetse is found throughout he Gold Coast, where it prevents the people from keeping he large-humped Zebu cattle which might add enormously o the meat supply; sleeping-sickness is endemic in 37% of the country. Again, the whole of Sierra Leone s subject to the fly, and sleeping-sickness is endemic in a tenth of the country. No one method of tsetse eradication is consistently effective. In the north of Nigeria one species was destroyed by complete clearing of the undergrowth: in the south removal of the undergrowth encourages it. Jungle clearance—the chief method of combating the fly—has its problems. In some areas the sleeping-sickness service is recommending cutting trees, whereas the forestry service is recommending planting.

WORLD MENTAL HEALTH

WHEN it met in London last August the International Congress for Mental Health drew attention to the mental aspects of the main programmes of the World Health Organisation and urged that these aspects should have full attention. The executive board of W.H.O. has now approved this recommendation, and Dr. Brock Chisholm, the director-general, has announced that a mental-health programme for W.H.O. will be submitted next January to the board's third session. The World Health Assembly will be recommended to raise the low degree of priority hitherto accorded to this part of its work.

The World Federation for Mental Health, formed at the time of the international congress, is among the voluntary bodies now officially recognised for consultative purposes by the World Health Organisation and by UNESCO. The federation already comprises 21 mental-health associations of different nations, and others are likely to be admitted shortly. Dr. André Repond, of Switzerland, now vice-president, will succeed Dr. J. R. Rees as president next year. Prof. H. C. Rümke, of Holland, is chairman of the executive board, which will meet in Amsterdam in January. Arrangements are also now being made for the assembly of the federation to be held in Geneva next August.

VACCINIA AFTER BOXING

A SMALLPOX scare in Norway last September arose from a case presenting several curious features. The story begins with a young Norwegian soldier who had been vaccinated against smallpox in childhood and who came to England on Sept. 8 as a member of an Army athletic team. On the 15th and 17th he took part in a boxing competition. On the 20th he noticed a rash on his face, but he did not feel ill: indeed, he felt so well that before returning to Norway he indulged in much sight-seeing, visiting among other places the House of Commons. On his return to Norway his rash had developed into a pustular eruption and he was admitted to the Ullevaal Hospital on Sept. 25. The pustular eruption on his head, neck, and right upper arm must, it was thought, be due to one of two things—vaccinia or variola. If the cause was variola a large crop of secondary cases might be expected both in England and in Norway; but this aid to differential diagnosis would come too late for effective action. Material from the eruption was therefore sent by air to London for laboratory tests, and these tests showed the infection to be vaccinial. But how was it incurred? The patient was not aware of any contact with anyone who had recently been vaccinated.

Reporting the case to the Norwegian Medical Society on Nov. 3, Dr. Per Hanssen suggested that there may have been vaccinia pus on the boxing gloves of one or other of the three men with whom the patient boxed in London a few days before the first appearance of the rash. The length of the interval between the boxing and the appearance of the rash, and its limitation to just those parts of the body which are most exposed to abrasions during boxing, supported this explanation.

THE second World Health Assembly will be held next year in Rome, probably beginning on June 20. Britain's invitation to the assembly to meet in this country was withdrawn for economic reasons.

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[1] Nash, T. A. M. Anchau Rural Development and Settlement Scheme (3s. 6d.). Davey, T. H. Trypanosomiasis in British West Africa, 1947 (2s.). Buxton, P. A. Trypanosomiasis in Eastern Africa, 1947 (3s.). H.M. Stationery Office.

[2] Nash, T. A. M. Tsetse Flies in British West Africa (30s.).

as dental officers of hospitals; senior medical staff engaged on clinical work but not of specialist status."

Having determined the needs of their service in terms of whole-time and part-time posts, the boards must then decide which members of the existing staffs are of *specialist status*.

> "In many instances the specialist status of the practitioner will be clear, deriving from the possession of academic qualifications, diplomas, &c., gained after postgraduate study, and from experience and practice as a consultant. In others—e.g., where a practitioner is engaged in general practice or in administrative work as well as in the clinical practice of a specialty—it will be necessary to have regard to length and nature of experience and to the practitioner's standing as a consultant amongst his colleagues. It is clear, however, that the determination of status cannot depend solely on the possession of postgraduate qualification, but must take account of experience, which may of itself suffice to warrant acceptance as a specialist; and that practice exclusively as a consultant or specialist cannot be applied as a criterion, since a number of practitioners engaging in other medical work may be qualified as specialists by experience or otherwise, and their services will be essential for the adequate staffing of the hospitals."

In assessing the status of their existing staffs a board of governors will be guided by its medical and dental committee, and a regional board by a special committee constituted as follows:

(a) Two general physicians, two general surgeons, and one obstetrician and gynæcologist practising (or retired from practice) in the area of the board;

(b) Two specialists of the branch under review, one of whom should be nominated by the appropriate university.

When these decisions have been made, and the terms of service and remuneration have been announced, the boards will be in a position to offer long-term contracts to their staffs, taking into account as far as possible the circumstances and preferences of the person concerned. "Only after posts have been offered to suitable existing staff on the new basis should any vacancies or additional posts be advertised for open competition."

PERCUSSION OF THE HEART

IN this mechanical age some of the older methods of physical examination are lapsing into disuse. As long ago as 1923 Cabot[1] declared: "The longer I have tried to percuss the heart area, and the more I have watched others attempt to do so, correlating the results with post-mortem records and Röntgen findings, the less I believe in the value of cardiac percussion. I rarely attempt it." Such a view was naturally popular, for it was in keeping with the spirit of the times; and it simplified the physician's work, for learning to percuss accurately takes time, care, and thought. Radiography impresses the patient, and it has the real advantage of providing a permanent record. Thus despite occasional protests, such as that of Kurtz and White,[2] who showed that percussion compared favourably with fluoroscopy, the denigration of percussion continued, and it looked as if it had received the coup-de-grâce in the Lumleian lecture of 1936[3]:

> "As a final effort to resuscitate a dying method which is packed with fallacies and imperfections, there have been attempts to square the results of percussion with those of radiology, but they have led to nothing. . . . The tokens of sterility are upon it . . . in the light of X rays it will shrink into obsolescence."

A very different conclusion might be drawn from a report by Stroud and his associates,[4] who have compared measurements of the total transverse diameter of the heart by percussion and by radiography. With the chest vertical, the right border of the heart was percussed in the fourth intercostal space, and the left in the fifth space. Percussion was direct—"the stroke was made lightly and evenly by the pad of the middle finger of the right hand against the chest wall." In 305 males 74% of the measurements made in this way were within 10% of those obtained by radiology, whilst 88% were within 15%. Further analysis showed that 58% of the measurements from percussion were within 1 cm. of the X-ray measurement, while 89% were within 2 cm. In th 45 females examined 58% of the estimations by percussion were within 1 cm. of the X-ray measurement, and 90% were within 2 cm.

The X-ray enthusiast may protest that the tot transverse diameter of the heart is a crude guide t cardiac enlargement; and both Kurtz and Whi and Stroud admit that by percussion the measurem for the left border tends to be greater, and for the rig border less, than that obtained with X rays. On th other hand, except to the expert, X-ray estimation h its own mathematical hazards. The importance radiography is no excuse for letting percussion becom a forgotten art.

THE MIND IN ITS SETTING

IN an old pantomime trick, the comedian undertak to prove that the little man is as tall as the gian And so he does, in terms of inches; but his tape-measu is made of elastic. Science, which has the duty of maki exact measurements, also has the task of scrutinis its tape-measures, especially when these are relative new and stretchable.

Tests for measuring intelligence, though convenie —more convenient, indeed, than is altogether convenie —should not be accepted too firmly as measuring factor which we cannot even define. As a child grow environment interacts with heredity to establish intelligence. (If we doubt this, we need only consid those cases of children lost in infancy and reared animals, whose abnormal environment brings them a state indistinguishable from mental defect.) He an intelligence test, to be effective, must test the subj within the frame of his environmental experience. conversely, as Mr. Julian Blackburn, PH.D.,[1] puts it:

> "the more unfamiliar an individual is with the kind material embodied in a given test, the more he is unfami with the kinds of techniques it is necessary to use in ord to answer the test questions satisfactorily, the small his degree of sophistication about the tests, the less w the score he obtains be likely to represent his innate le of intelligence."

An extreme example, Dr. Blackburn suggests, woul be to give a test designed for English school-childre to an uneducated Nigerian boy: his innate intelligen would have little chance of revealing itself in such situation. Similar, though less extreme, factors ma account for differences in test scores between urba and rural children, northerners and southerners, an people in different social classes. In short, the tests ar not the direct measure of innate intelligence they ar meant to be: they measure, instead, a resultant the forces of heredity and environment. Nor is th intelligence quotient a fixed star: it seems that negroe who migrate from the southern to the northern State of America show a rise in test scores; and, withi limits, the longer the time a negro has spent in th north since his migration, the greater the rise in his I.Q. No doubt we all suffer some deprivations: we hav abilities which are never given the chance to develop and which atrophy from lack of use; and we have n means of knowing, at present, how such local stunting

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1. Cabot, R. C. Physical Diagnosis. 8th ed., New York, 1923; p. 135.
2. Kurtz, C. M., White, P. D. *Amer. J. med. Sci.* 1928, 176, 181.
3. Parkinson, J. *Lancet*, 1936, i, 1337.
4. Stroud, W. D., Stroud, M. W., Marshall, D. S. *Amer. Heart J.* 1948, 35, 780.

1. Influence of the Social Environment on Intelligence Test Scor From the British Social Hygiene Council, Tavistock Hou North, Tavistock Square, London, W.C.1. 1948

d delayed treatment. The profession had been able do much more good when the public had unquestioning nfidence.

Miss **Bronwen Lloyd-Williams**, who opposed the tion, pointed out that biology was taught in schools give some understanding of positive health. The blic needed also to learn something of disease. ening the body to a machine, she claimed that ple should be enabled to deal with minor repairs, l should know enough to recognise the moment when expert mechanic should be called in.

There were, she suggested, four classes of people: wilfully ignorant, the malades imaginaires, the ow-alls, and the untaught. Doctors were inclined to hten people by using technical terms. They still fered from the power-complex cum high-priest attile which had terrified an earlier generation. In this ightened age, the spread of knowledge was inevitable, l among the benefits to be derived from it were: lier diagnosis and treatment; the prompt recognition serious disease by the patient, who would then have e to put his affairs in order; and improved coöpera- between patient and doctor. No health service ld work effectively without such coöperation. "I want learn how to live—not just to be kept alive." Educa- could help the public to deal with the routine ills everyday life. Miss Lloyd-Williams concluded with appeal to doctors to come down from their aloof lestal: "You want to help us: we want your help."

Of the subsequent speakers, one made the point that r born of ignorance is worse than fear born of know- ge. Dr. **Kenneth McFadyean** quoted one of the re famous sulpha drugs and radium as examples of , with some knowledge, the purpose and effects of edies might be misunderstood and cause alarm. To e minds, he said, the application of radium meant y one thing—cancer.

r. A. **Dickson Wright** gave eloquent support to motion. The hardest patients to deal with, in his ence, were those who knew most about themselves; much easier to gain the confidence of the ignorant. o countries which were far ahead of Britain in education, he had been impressed by the preva- of quackery and by the amount of patent medicines homes. People from one of these countries reported the hospital outpatient department with lists of tions; these were, in Charcot's words, *malades du papier*. Instruction in the first signs of cancer ght to the hospital more cancerophobes than early s of malignant disease. On the other hand, he had eatedly seen people in the nursing and medical fessions who, having malignant disease, had let their dition drift until too late. The less people knew, happier they were. In support of this contention mentioned medical students who, even after ning in the basic sciences, were commonly gross pochondriacs.

Nevertheless, the motion was lost by 56 to 41 votes.

REPRESENTATION OF SPECIALISTS

An exploratory committee[1] met in September, under chairmanship of Sir Lionel Whitby, and put forward ggestions for the formation of a joint committee to present consultants and specialists. Discussion of these ggestions by the Royal Colleges has been private, but e gist of them now appears in a report of the central nsultants and specialists committee of the British edical Association, held on Nov. 4.[2] This announces e composition of the joint committee, on which seats e allocated as follows: Royal College of Physicians, 3; oyal College of Surgeons, 3; Royal College of Obstetricians and Gynæcologists, 2; Royal College of Physicians of Edinburgh, 1; Royal College of Surgeons of Edinburgh, 1; Royal Faculty of Physicians and Surgeons of Glasgow, 1; British Medical Association, 6. There are to be two secretaries, one appointed by the colleges and corporations and the other by the B.M.A. consultants and specialists committee. The B.M.A. committee accepted these proposals.

FREEDOM IN MEDICINE

NEW ORGANISATION FOUNDED

Some seven hundred doctors, meeting at Caxton Hall, London, last Saturday, voted for the establishment of a new body, to be known as the Fellowship for Freedom in Medicine. Lord **Horder** was elected chairman. The following resolution, put by Dr. A. V. **Russell** (Wolverhampton) was passed:

> That the fellowship is not in opposition to any existing medical organisations, but is prepared to strengthen their hands in so far as they are prepared to work for the maintenance of medical freedom.

STATEMENT BY LORD HORDER

Lord **Horder** traced the origin of the meeting from the time, last June, when the medical press published a letter[1] by him "inviting the views of any who were concerned about the practice of medicine in this country as the result of the collapse in the resistance of the B.M.A. against the introduction of the unamended National Health Service Act."

The response to this invitation, said Lord Horder, was unexpectedly prompt and large. At first letters came mainly from men and women who had not joined the service, but latterly they had come mainly from practitioners in the service. Altogether he had received over 1700 letters expressing concurrence that something should be done to ensure the freedom of medicine from outside control; and letters were still arriving at the rate of about 20 a day. He had also received several hundred additional letters, many of them offering constructive suggestions.

He had nominated six colleagues—three general practitioners and three specialists—to help in the analysis of these letters. As the work increased, these six added six others, again with equal distribution between general and specialist status, and with due regard to the provinces. This group of twelve had acted as an informal interim committee, under Lord Horder's chairmanship, with Dr. Reginald Hale-White as vice-chairman, Mr. Reginald Payne as hon. treasurer, and Dr. E. C. Warner and Dr. G. H. Rossdale as hon. secretaries. The meeting, said Lord Horder, was one of friends, friends of friends, and those who had written sympathetically; so far the profession as a whole had not been approached.

At the special representative meeting last May, the B.M.A. had its last chance of urging resistance against the dragooning of the profession by politicians; that chance was thrown away. "In January we marched unitedly and effectively: in May, more like a rabble, we surrendered." The trouble began, however, much earlier. "From the very start we have lacked dignity and a due apppreciation of our use and value in society. We let ourselves be used as pawns in the game instead of master pieces." The profession's own weakness was partly responsible for the National Health Service being born in dishonour; "for we allowed ourselves to be a party in the mad precipitancy of the Government, whereby the public was made to contract for health benefits which did not exist."

"What, today, is the result of all this? The living power of medicine, resident as this has always been, and

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[1] See *Lancet*, Aug. 7, pp. 221 and 233.

[2] *Brit. med. J.* Nov. 13, suppl. p. 173.

[1] *Lancet*, 1948, i, 965.

Special Articles

EDUCATING THE LAYMAN

HUNTERIAN SOCIETY'S DEBATE

LAST Monday the Hunterian Society met at the Apothecaries' Hall, London, under the chairmanship of Dr. G. R. MATHER CORDINER, their president, to debate the motion That the Practice of Instructing the Layman in the Nature and Treatment of Disease is being Carried to Excess.

Proposing the motion, Dr. W. J. O'DONOVAN pointed out that the public is instructed through all sorts of books, journals, and pamphlets. Who, he asked, were the people who were being thus taught? He himself had learned the right use of English by the classics; words had some meaning to him. Then he learned chemistry, anatomy, and other sciences, and only after that had he studied the mysteries of borborygmi. The public, on the other hand, was receiving medical instruction without any preliminary discipline; and doctors who took on this task were conveying the unknown to the unteachable.

The effect of teaching internal disease to the untaught and the interested was disastrous. Dr. O'Donovan mentioned as an instance of the way knowledge is gained and used by some lay people, soldiers who in the late war convinced presidents of medical boards that they had a "gastric stomach" and were therefore unfit to serve in dangerous places. There were, moreover, many unstable people among the public; and so potent was the effect on them of instruction that young patients would come and confidently assure their doctor that they had maternal fixation or an inferiority complex.

There was nothing sadder in our civilised life than the burden of consumption. Osler was persuaded that with the spread of knowledge incidence would diminish. The public now had knowledge; yet their fear of the disease had increased, and the consumptive had become almost an outcast. Where should the spread of knowledge be stopped? The answer was pragmatic. Knowledge should be imparted only if it was put to good use. Furthermore, was it good that the public should be aware of the occasional grave mishaps of medicine, and if aware would they trust the profession? In this connexion, could the truth ever be recognised by interested people, to whom mishaps loomed too large? As to informing the politician, Dr. O'Donovan asked: "Does he learn from us to aid the sick or to circumvent his opponent?" Was it good that doctors should teach medicine to their masters? It was not wise to expose the profession's weakness to those who might be its undoing and thus harm the public good.

Dr. O'Donovan denied that doctors have the necessary *gifts of diction, argument, and logic with which to carry* on teaching. How many, he asked, could teach medicine in such a way that their hearers understood and were not made more frightened? Instruction of the public should stop now; for they had not digested what they had already heard. Their indifference to the claims of Medicine when its body lay on the floor of Parliament showed him how uneducable they are. And what pathology were they most avid to learn? Murder most foul, arsenic, and old lace. A public avid for medical knowledge was a public to be pitied; and preoccupation with man's complexes and motives was not associated with stability and the pursuit of the pious virtues.

Opposing the motion, Dr. CHARLES HILL agreed that instruction should proceed only to the extent that it was useful; but by this he meant useful, not to the profession, but to the public. The work of health education demanded an explanation of medical knowledge. Moreover, "people demand to be relieved of the ex-cathedra pronouncements of the medical profe They demand to have their intelligences appealed t explanation."

In diphtheria and tuberculosis much had been by explanation to dissipate fear; in fact no fiel health education was more rewarding than tubercul As for the encouragement of neurosis, the neurosis already there; and medical instruction simply prov the neurotic with new material. Dr. O'Donovan spoken as if the effect of instruction were to pro fear. This Dr. Hill denied; and he gave as an exa instruction in the processes of cancer which, he clai could reduce the fear that lurked in many adult mi Fear could, in fact, be dispersed by understandin what actually happened in disease. As a profe doctors were apt to assume that medical knowl was incapable of explanation to laymen. The atti was that "only we can understand the mysterie the human body."

Apart from health education, was it useful for public to know about disease? Most people interested in disease. They enjoyed ill health; it provi a conversational opportunity never to be missed, some divided their lives into two parts—before since their operation. To offer no explanation wa leave the public open to patent-medicine sellers, were coining money from fear. The coated ton the heavy feeling behind the eyes—which were open a very simple explanation—were built up by advert ments into elaborate syndromes. The doctor's duty to counter such misinstruction.

Acknowledging the fact of public interest in dise doctors should try to secure that information was ba on physiology. The profession should also explain m about diagnosis and about treatment. Indeed patie had the right to know, though he conceded that rega must be had to the patient's mentality. In any eve the old mystery surrounding the practice of medici was dead; and silence was now interpreted grave Knowledge of health and disease was not the docto sole preserve.

By being more forthcoming, the doctor would fo a warmer and closer relationship with his patient. Th feeling that the profession was a closed corpor with a secret corpus of knowledge had promoted understanding in the *last* few years. *Patients* were nearly so fearful with as without knowledge. "W lose sight of the fact that there are fascinating and roma tic stories in the human body. Let us ring up th curtain. Let us assume that the public are as intellige as we are."

Miss ARNOT ROBERTSON, seconding the motio questioned the value of the instruction which had alread gone out to the public. She quoted the case of a woma whose baby had lately been vaccinated at a famou *hospital. According to the mother's account,* this bab "came out in a black rash. I got all the doctors i front of me," and they admitted they had vaccinate the child with lymph from a black man's baby.

Visiting other houses, Miss Robertson was amazed a the little she had known and at the brave comportment of her friends; for their bathrooms were filled with medicine bottles. Some of the bottles were half full, indicating perhaps that the contents were *being preserved* against a return of a particular illness. These people were either bearing up wonderfully under a great load of disease, or they were hypochondriacs as a result of the barrage of suggestion in radio and press.

As a doctor's daughter, Miss Robertson expressed a healthy contempt for coloured mixtures; and she was pleased to have been reared at a time when no knowledge of medicine filtered through to the nursery. *Her opinion* was that the present flow of instruction simply increased suspicion. Doctors, by telling too much, promoted fear

The Act in Action

2. THE GENERAL PRACTITIONER

ls winter approaches, practitioners are taking stock. ne are finding things worse then they hoped, and others ter than they expected ; but nearly all agree that, atever epidemics may befall the country, their'section the service will not break down. Acute illness has er gone untreated in Britain ; so in this respect their den will be no heavier than in other winters. If, rever, in the busy winter months the doctor is to give attention to the seriously ill, he will have to save e on surgeries swollen by the addition of those who the first time are able to turn to him for the treatment minor disorders.

Whatever the doctor's view, the public has welcomed new service ; and when the final count is made it y be found that between 90% and 95% of people have ered their names with practitioners. Both doctor and ent are pleased with their new and easier relationship. fore July 5 doctors were unhappily familiar with the ds of the less well-to-do uninsured patient once on road to convalescence : " I think I'll get along all it now, doctor "—meaning that the family wished be spared further fees. That is ended. Patients are gratified to observe that the new service is truly prehensive, as is evidenced in the domiciliary con-tant system—which, though surprisingly seldom used, ns to be working well. Complaints are few. The cipal cause of complaint is the time spent in waiting be seen at the surgery. A further cause—not strictly dical—is delay in payment of National Insurance efits. Whereas formerly insured people who had ome unfit for work were visited by the representative a friendly society and received some immediate ment, the National Insurance certificate must now ken to a local office and payment is delayed.

IN AND OUT

e patients remaining outside the service are y the rich and the elderly. They include some prefer to obtain the doctor's personal attention by onal contract, others who believe that in this way will get better attention, and still others who, haps living at some distance from the surgery, are ing to pay for a visit not warranted by clinical need. contrast with the experience of most others, a doctor side the service who is practising in a residential area orts that the patients coming to her are of no particular ancial, social, or age group. Unfortunately there are tances of ailing patients, ignorant of the allocation stem, who have not benefited by the service because doctor would accept them on his list.

In joining the service most people seem genuinely to lieve that it really can provide for their needs. Some-tes, however, patients seem to have joined simply cause they would otherwise be unable to obtain free dicines ; and those doctors who have stayed out of e service, as well as some in it, argue emphatically at such patients should be allowed to obtain drugs thout charge, even if the range were restricted to non-proprietary compounds. Patients sometimes have joined om a determination to get some return for their ntributions under the National Insurance Act, believing istakenly that what they contribute goes entirely wards the cost of the medical service. Others, again onfusing the two Acts, think that they must enter their ame with a doctor in the same way that they register r insurance.

In deciding whether to enter or to stand apart from he new service, many patients are undoubtedly influnced by the attitude of their doctors. Some of these underline the advantages to be gained by the private patient—more leisurely attention, visits on request, and consultations by appointment. Many of these doctors have always restricted themselves to a small number of patients, to whom they have given a very high order of medical care ; and they point out that with a capitation fee sufficient to provide something approaching their former income they would not attempt to persuade their patients to stay out.

Other doctors do not discriminate between private and N.H.S. patients, except that they may visit the former on request, regardless of clinical urgency. One practitioner in the North Country says that quite a large number of his patients decided to stay out of the service until he pointed out that, except in respect of such visits, he proposed to give equal attention to everyone ; all except three have now entered the service. Nevertheless, the understandable spirit of personal contract lingers on ; and former private patients now commonly express their appreciation by presents.

GOING AND COMING

The war years and publicity in the press have impressed the lay mind with the idea that the doctor is a very busy man. The autumn is, of course, normally a slack season ; but practitioners, whether in town or country, agree that they are making hardly any more—and sometimes fewer—visits than they usually do at this time of year. The public are responding well to the appeal to get in touch with the doctor early in the day when a visit is required ; the occasional exceptions are mostly mothers reluctant to bring their children to the surgery, and patients who, knowing the doctor to be hard-pressed, hopefully decide in the morning not to send for him, only to find later in the day that their optimism is unjustified.

In some parts coöperation over attendance at surgery is not so good, patients tending to come en masse towards the end, in the hope of being seen at once. The numbers attending have risen, according to the area, by between a quarter and a half. Every account agrees that frivolous complaints are no commoner than before ; in some parts, however, there is slightly increased readiness to attend with trivial disorders. As was to be expected, the start of the service has brought to light untreated illness in the old, in children, and in women. The amount of hitherto undisclosed illness is particularly large in women, many of whom have suffered for years from such chronic disorders as prolapse of the uterus without referring to a doctor.

SAVING TIME

Many practitioners are convinced that more will have to be done to reduce the time taken up by surgeries ; and some, particularly in industrial areas, contend that the case for the immediate construction of health centres, from prefabricated units or by conversion of existing houses, is unanswerable. In some places waiting-rooms have always been too small, patients spilling over into street or alleyway. Such waiting-rooms—often not only small but dark and stuffy—are the best imaginable places for spreading infectious diseases and thus adding to the doctor's work. Even in the better-to-do districts some waiting-rooms are too small for the new demand ; and in certain instances practitioners are having extensions built at their own expense, though well aware that the need will pass when centres are built. Moreover, centres, by affording more space and separate examination rooms, can save time in the interviewing of patients ; and if a nurse or other qualified attendant worked there the doctor could be largely relieved of such time-consuming duties as the giving of injections and the application of dressings. It is even reasoned that if qualified nurses are too few the voluntary spirit should be given an opportunity for expression by the employment of V.A.D.s or similar auxiliaries. Health centres are pictured always must be, in the personnel of the profession, has passed out of its hands to be lost—let us hope only for a time—in the dead machinery of the bureau. Medicine has indeed become . . . a branch of the Civil Service. We are no longer experts. We sit and sign forms. With no time to diagnose their diseases we pass our patients to other persons and to institutions, knowing full well that these cannot dispense the health benefits which may be needed.

"In the economic field doctors have been manœuvred into surprising positions. Some are faced with serious financial insecurity. Others are making bigger incomes than they formerly did, but are doing less doctoring in return. And the appalling thing is that it is Dr. Peter who is paying Dr. Paul."

The responsibility for a high standard in medicine lies with none but the doctor, for he alone can tell what is good doctoring and what is bad. "We must bestir ourselves and come to grips with the situation." The essence of good doctoring is diagnosis; and diagnosis calls for time and a close-up with the patient, both of which are at the moment denied to thousands of practitioners. Good doctoring calls also for two other things that concern the doctor personally and which seem now to be lacking—a feeling of satisfaction in the work he is doing, and a sense of economic security.

The purpose of the new organisation should be akin to that of the old city guilds, which stood for a high standard in the craft they pursued and took powers to preserve it in the public interest as well as in their own. The aim should be to keep the standard of British medicine and British doctoring at the high level which it has attained, and to assist the State in making the best that is in medicine available to the whole community.

Lord Horder concluded: "Our hand should be against no man. We are a breakaway from no other body; we exist for a primary purpose which I have tried to make clear. If, and when, we are confident that the B.M.A., whether by reconstitution or otherwise, and/or the Royal Colleges accept, and carry out, the obligation to the public for which we ourselves stand we can dissolve into thin air." As to the future of medicine, "I am still an optimist. We who are here are the custodians of medicine for our patients. Let us look to our charge. Today it needs all our vigilance and all our care."

FURTHER RESOLUTIONS

The meeting passed the following resolutions, the first proposed by Dr. L. W. Batten and the second by Dr. D. R. Goodfellow (Manchester):

> As this body is deeply disturbed by the way outside influences may affect the quality of medicine in this country, it is determined to do everything in its power to render the highest standards of practice possible in the future.
>
> That the executive committee be asked to consider ways in which freedom in medical matters can best be preserved by the profession.

OFFICE-BEARERS

The following office-bearers were appointed:

Chairman, Lord Horder; vice-chairman, Dr. Hale-White; hon. treasurer, Mr. Payne; hon. secretaries, Dr. Warner and Dr. Rossdale.

The executive committee is to consist of 20 members, of whom 10 were elected, as follows:

Dr. A. C. E. Breach (Orpington); Dr. S. F. L. Dahne (Reading); Dr. Frank Gray; Dr. A. V. Russell (Wolverhampton); Dr. G. M. Goodwille (Attleborough, Norfolk); Dr. D. R. Goodfellow (Manchester); Dr. Barbara Abercromby (Liverpool); Dr. Campbell Shaw (Bournemouth); Dr. J. G. Thwaites (Brighton); Prof. K. D. Wilkinson (Birmingham).

The minimum annual subscription was fixed at one guinea. A constitution is to be drafted by the executive committee and placed before the next general meeting.

THERAPEUTIC SUBSTANCES REGULATION

New regulations[1] made under the Therapeut Substances Act, 1925, will come into force on Dec. 1.

Diphtheria Prophylactic.—The position with regard to t prophylactic is clarified. The Therapeutic Substanc Regulations, 1931, have one schedule covering all types this substance. This schedule is now amended setti out (1) the general provisions applicable to all types of t prophylactic, and (2) special provisions applicable to e type.

Antitoxins and Antisera.—The 1931 regulations con ten schedules for the substances of this class which d in a few words and phrases only. The regulations h now been recast to provide for (1) a general schedule stating requirements common to all these substances, and (2) a s of short special schedules each relating to a partic antitoxin or antiserum. The provisions applicable to dysenteric serum (Shiga), other antidysenteric sera, and pneumococcal sera set out in the principal regulations been omitted from the amending regulations. It is consid that sulphaguanidine has rendered the use of antidysent serum obsolete, and that sulphonamides and penicillin done the same for antipneumococcal serum.

Additional Substances to be Controlled.—Preparation human blood, and organic substances having the spe biological action of curare on neuromuscular transmis have been added to the schedule to the Act, as being substa or preparations the purity or potency of which cannot adequately tested by chemical means. Preparations of hun blood include any serum or plasma made from human bl and any dried product prepared from any serum, pla protein, or other substance. Organic substances having specific biological action of curare on neuromuscular t mission include *d*-tubocurarine chloride and its preparatio

Penicillin.—A more precise definition of penicillin preparations of penicillin to be controlled has been made.

Labelling of Therapeutic Substances.—Regulation 10 of the 1931 regulations has been amended, requiring t the vial or other container in which a therapeutic subst is offered for sale shall bear a label affixed by the ma facturer. This amendment is designed to control the chan of labels by persons other than the manufacturers. A fur amendment permits the required particulars to be ind marked on the vial in place of being printed on a label.

FACULTY OF OPHTHALMOLOGISTS

Between the two world wars several visits were by groups of ophthalmic surgeons to Europea American clinics. These were organised by the Percival Hay, of Sheffield, on behalf of the North England Ophthalmological Society, and were succe in the spread of knowledge and in international fellow

The idea has been taken up afresh by the Faculty Ophthalmologists, and last spring three parties of twe surgeons visited Holland, Switzerland, and Paris. T travellers are unanimous in praise of the unstint cordiality and courtesy which they received at all centres which they visited. Instruction and informat on special techniques and research were freely giv evidently after careful preparation.

The party to Holland was organised and led Mr. John Foster, of Leeds. Visits were made to t Hague, Scheveningen, Utrecht, Gröningen, Amsterda and Leiden, where Professor van der Hoeve, doyen of Dutch ophthalmology, together with assistants, read several discourses in English a demonstrated a corneal-graft operation. At Utrec Professor Weve performed the operations of intr capsular extraction of cataract, diathermy for detach retina, and dacryocystorhinostomy.

The tour of Switzerland was organised by Mr. W. Muirhead and Mr. A. B. Nutt, of Sheffield. Züric Berne, and Geneva were visited.

The journey to Paris was organised by Mr. R. J. Buxto ork. Those with localised practices complain that, no llowance being made for distances under 2 miles, they ave to bear most, if not all, of the expense of their car. As regards basic salary, this should come, it is maintained, ot from the local pool but from the central, or a eparate, fund. By a few, who compare the position of octors with that of dentists and opticians, restriction of he global sum payable to practitioners is seen as an ventual handicap to professional initiative.

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[1] Therapeutic Substances Amendment Regulations, 194 Statutory Instruments, 1948, no. 2418.

The young doctor wishing to enter general practice still confronted by formidable difficulties. If he should y to start on his own, he discovers that houses are hard o find and expensive to convert; payment for his ervices under the Act comes three months in arrears; nd local medical committees—even in apparently underoctored areas—are very cautious in meeting his request r a basic salary.

CONCLUSION

Most practitioners regret that the price of more equal ttention for all must be less attention for each. In the ng view the only solution is to have more doctors, and the short to conserve the doctor's time for his strictly rofessional work. At one pole the acutely ill patient, nd at the other the patient with mild bronchitis, are kely to fare no differently than they have hitherto. etween these two extremes the difference threatens to substantial. Many doctors have little time now to vestigate home conditions, to give considered advice, to attempt psychotherapy; and hardly any have the ure to supply extra services—such as circumcision of fants, which many people prefer to have done by their n rather than by a hospital doctor. By some practioners the start of the new service has been made the casion for lightening the burden of contract; for ample, sensing that patients no longer expect the rictly personal service hitherto demanded, a few have anned to zone their practices this winter. But most g to the concept of personal service as the essence of eral practice.

e majority of doctors, like the majority of patients, faith in the service. Just now some are discouraged an apparent lack of enthusiasm among those organg and administering the service at the top; the risk, seems, is that all may forget that this service is the best t provided. Others are disheartened that their profesonal colleagues on various bodies seem slow in interating the service for the common weal, and some of e local medical committees are coming in for particularly vere strictures. Individualism, once counted a virtue, ems to spell disaster in the committee room. The resent danger is that those who entered the service rudgingly may become confirmed in their resentment.

"Modern stress on the prevention of disease and the promotion of health has so far not affected the basic content or philosophy of the practice or teaching of clinical medicine to any appreciable degree. Clinicians still think almost exclusively in terms of diagnostic and curative service and look to the specialists in public health to provide the developments in preventive and promotive outlook and service which they freely admit to be desirable. The specialists in public health are able to influence administrative developments, but relatively unable to affect the basic philosophy of medical practice. . . . One of the most important factors in the implementation of a programme of Social Medicine will be a new scientific and philosophic approach to the science of ætiology in medicine which will give the clinician and the public health specialist a common approach to reform. . . . The essential point . . . is the concept that ætiology is usually multiple and that it should be approached from the point of view of three groups of contributory factors: (1) a constitutional trend or diathesis; (2) negative factors—i.e., deficiency of health-promotive factors; (3) positive factors—i.e., disease-producing agents. . . . It is already possible to give a rational although incomplete ætiology for all disease in terms of this triad."—Prof. J. F. BROCK, *S. Afr. med. J.* July 10, 1948.

Disabilities

17. ASTHMA

AFTER the serious disorders dealt with already in this series, asthma must seem but a minor disability; and indeed in a way it is. But not to the victim. The importance of a disorder within one's own personal universe is measured by a different rule from that one applies to the illness of others. Asthma is certainly a major factor in my life, as it must be with most sufferers. But the numerous physicians with whom I have discussed my case and those of my asthmatic patients have never seemed to appreciate the extent of the handicap. "You are all right between attacks?" they ask, and we usually reply inaccurately that we are. "Good" they say; "well this will lessen the frequency and intensity of the attacks. . . . And you know," they conclude happily, "no-one ever died of asthma."

I do not want to be unfair to my colleagues, and I know I must have treated patients much in this way. The reason is plain enough. Asthma is a condition in which successful therapy is extremely difficult as can be seen from the great variety of treatments.

For a long time I believed that one reason for the difficulty was that the name covered several diseases of widely varied ætiology. These included allergies to food, inhaled protein dust (dandruff, pollen, &c.), and bacteria; metabolic types probably associated with mineral imbalance; reflex irritation; autonomic irregularities; endocrine types; and purely psychological disorders—not to mention the cardiac and renal asthmas, which are separate entities. I now believe this to be a wrong approach. It seems better to regard the asthmatic attack as a constitutional response to an excitant. The immediate cause of the attack may be usually the same but not necessarily always so. A patient who is allergic to fish and various animal hair—as I am—may also start wheezing from purely reflex stimulation or psychological causes. A drop of saliva swallowed "the wrong way," touching some spot that seems to me to be around the pyriform fossa, starts an immediate spasm. Again, when breathing quite freely I once saw a child run into the road in front of an approaching car, and in thirty seconds I was hanging on to the railings—so bad was the dyspnœa.

Without the facilities of a Draper[1] it is impossible to analyse completely the constitutional type of the asthmatic; but a generalisation from personal observations may perhaps be allowed. Most asthmatics are temperamental, egocentric, introspective, and imaginative. They tend to be over-sexed rather than undersexed. They are sensitive, in the lay sense of the word. More than most, they crave affection, and attention, and many an attack can be traced to frustration in this direction. The physical type in my experience is generally asthenic, though I know a number of the athletic constitution. True pyknics seem to be seldom asthmatic; the condition is frequent enough in fat women over middle age, but here the basic type is obscured. My impression is that fewer asthmatics are blond than might be expected from the proportion of blonds in the population.

But enough of generalities. Let us turn to the disability. First I have phases of relative or almost complete freedom for weeks, and these are succeeded by weeks or months when every day or night is marked by some wheezing and dyspnœa. During the active phases attacks are more frequent at night and I wake breathless from once to five or six times. In the morning at these times there is nearly always wheezing and some cough, with expectoration of three or four plugs of extremely gelatinous mucus. A cup of tea as hot as not as a desirable supplement to be added when times are better but as an immediate necessity. Their construction would have two effects: first, it would benefit patients by enabling the doctor to give more time to his proper work; and secondly it would relieve hospitals of a host of trivialities which the practitioner now has to pass on to them. From a crowded surgery the patient with a scalp wound must perforce be sent to hospital. At a centre the nurse could cut the hair and clean the wound; and the doctor would find time to insert stitches.

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[1] Draper, G. Human Constitution. Philadelphia and London, 1924.

Many maintain that in the long run better use of the doctor's time would be gained by improved health education, aimed at persuading patients to report serious illness in its earliest stages, and at helping people to recognise the minor disorders which do not need medical attention.

PAPER WORK

The record system under the Act differs little from that under National Health Insurance. All practitioners agree on the need for complete records, though some find it impossible at the end of a day to note each visit. Similarly, no serious objection has been voiced against the certificates issuable under the National Insurance Act, though it is sometimes held that their number should for convenience be fewer than the existing six—first, intermediate, final, convalescent, monthly, and voluntary. On the other hand, the additional certificates for clubs and employers—though a fee is chargeable—are a grave annoyance to many, who believe that all such further certificates should be abolished by using the insurance certificate for these purposes.

Since 1939 the practitioner has become conditioned to filling in certificates dealing with such varied topics as extra milk or coal, new houses, and brassières and corsets. These he writes ungrudgingly, though holding that some are a waste of his time and that others (notably form 2c for extra milk) should be renewable at longer intervals. One form, however, is most vehemently described as a pointless farce; this is O.S.C.1, which each patient has to obtain from his doctor before first having his vision tested. The object of this form is supposedly to ensure that patients with visual disturbance who have some other disorder shall receive medical attention. No practitioner interviewed believes that the present procedure has the slightest value to this end. "The local optician," said one, "knows a great deal more about eyes than I do. So any patient wanting his eyes tested is referred back to me by the optician if the visual disturbance is secondary to some other disease. In this way the patient has a double wait at my surgery." Some would welcome control on the patients seeking spectacles, but no-one appears to believe that even for this purpose the procedure is effective.

The time taken up by the patient wanting a certificate is not simply the time needed to reach a decision and sign the paper. A mother wanting extra coal often opens the interview by requesting examination of her baby's chest; only when the child has been stripped and examined is her true purpose disclosed. Others ask quickly enough for the form, and then say: "While I am here, doctor . . ." going on to explain some minor disorder which in itself would not warrant their coming to the surgery. There is thus good reason for reducing as far as possible the number of attendances for forms and certificates; and the doctor sometimes regrets that he is not empowered to instruct the pharmacist to repeat prescriptions.

OTHER EFFECTS

In some ways the doctor's work is now less complex. Some, for example, with fewer private accounts no longer need secretaries. Many more have gladly closed their dispensaries. Hitherto the practitioner dispensed medicines for any of several reasons: the patient's convenience; regard for a local tradition; a desire t keep down the patient's expenses; and profit to th practice. Doctors' dispensaries now survive only i country areas and occasionally as an additional servi to private patients.

To the doctor's wife the new régime has made difference. At first in some practices there was a st flow of inquiries by patients uncertain how to ob benefit under the Act. Now the commonest diff reported is a reduction in the stream of telephone throughout the day; this is attributed to greater for the doctor's convenience by those who no lo pay for each item of service. On the other hand, burden is increased by overflowing waiting-rooms prolonged surgery hours; and wives, it seems, a the establishment of health centres even more ca than their husbands.

TERMS OF SERVICE

It is still too early to judge the full effects of the conditions on the practitioner's earnings; but cer *trends are already clear. On the present showing,* income of some in residential and rich suburban a has fallen by as much as 50–60%, whereas in com industrial practices incomes have risen by a quarte more. On the average practitioners seem to believe their annual earnings will be reduced by about a th At the same time the amount of work and responsib has increased. Most contend that under the pre system the capitation fee should be increased to at £1; and it is thought that the appropriate Wh council will be easily persuaded of the need. But op favours, as a preferable alternative, a sliding-scal fees, to encourage small practices. The number patients that each doctor can look after properly is at between 2000 and 3000, according to temperam and the compactness of the practice. If patients distributed equally between practices in each doctors would seldom find themselves with more 2500 patients; yet some have very substantially The balance may partly right itself by patients weary of waiting at overcrowded surgeries; neverthele practitioners wish that their income could be dete by some further criterion than numbers.

Perhaps the least contented of all doctors just are those who, having achieved special experience gained higher qualifications, entered general prac They assert—not without reason—that they have much to maintain and enhance standards of prac Yet those who hold posts at hospitals in medium-s towns believe that they may soon be supplanted whole-time hospital officers; and in actual gen practice they are financially on the same footing as others. None of them seems confident that their c will receive attention. The younger are busily detach themselves from general practice to devote all their ti to a specialty; the older see themselves as the last o dying race.

Other difficulties can perhaps be more easily overco For such equipment as cotton-wool, sutures, spirit, a needles, there is an allowance of 2s. 6d. per 100 patie per annum. Thus with 2000 patients the total allowa would go on 8 lb. of cotton-wool at 6s. per lb. expendable equipment, it is argued, should be repla free. There is particular discontent over the lack of a encouragement to purchase necessary apparatus; here the purchaser cannot even claim income-tax reli "The present arrangement," as one practitioner put "encourages us to try and get by without doing our conscientiously."

Country doctors are outspokenly dissatisfied with th mileage allowance, in the determining of which, th say, regard should be had for the time lost to professio

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spite of our meagre cheques, in spite of that green
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Subsequent search in the archives seems to show that only two such cases have ever come to operation—one in Brazil and the other in the Argentine—though some 50, including one in England, have been noted by radiologists and anatomists. Why such a case should be presented to a poor general surgeon in the wilds when it would have been so much appreciated elsewhere I don't know. But Providence (a queer thing to call the Minister of Health) will no doubt see to it that in future only routine cases arrive at small hospitals.

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I am the wife of one of those ex-Service doctors who did a refresher course on demobilisation, bought a partnership share pre-July 5, and made up his mind to join the scheme and make a go of it. Needless to say, like thousands of others I'm mother, wife, char, maid, receptionist-secretary, cook, and under-gardener. My sense of humour, though sore tried, still functions. The wells of sympathy have not yet run dry, though they came very near it when the regional medical officer called to see how we were getting on. He enjoyed my gingerbread, and, recognising my importance as a cog, sent for me to ask whether I had any complaints. I could only stutter that help would be much appreciated since the health centres were not forthcoming. Out they came, those slick well-tried clichés. He was sorry of course—weren't they all?—but *you* know how it is.

My dearest wish is that the Rt. Hon. the Min. himself should drop in at the rush hour, preferably when there are emergencies in both practice and kitchen. Perhaps *he* would be kind enough to open the front door, see to the tradesmen at the back door, exercise the dog and queue for the fish, give the child its supper, pacify an angry caller, soothe a worried one, comfort a sick one, and take in the bottles at the door and test their contents. Perhaps *he'd* go down on *his* knees and scrub the hall after 40–50 patients had walked over it.

I'm not against the N.H.S. or Mr. Bevan, but there are times when one forgets that we now get our medicine free.

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Nov. 8, 1848–Aug. 14, 1887

As a robin sings, his keen notes calling
clear beyond the rustling dreariness of rain
—gray November eve, the leaves a-falling—
like hope in pain,

So he sang at last, his spent hand bringing
to sunlit scene and shadow fragrancy and balm,
—hawthorn blooms again, the blackbird's singing—
Old England's charm.

Oft an exile's heart he's set a-throbbing,
—Wiltshire downs are distant, the alien city shrill—
in many a captive soul he's stemmed a sobbing,
and sings on still.

possible aids this expectoration, and indeed generally affords a good measure of relief of the dyspnœa. By the time I set out on my rounds breathing is usually comfortable and may stay so most of the day. But a steep hill or several flights of stairs may suddenly produce a constricting feeling round the chest, and a sensation in the legs best described as a *tingling* and weakness. I halt and use my atomiser (of which more anon) and after a minute or so can go on at a slower pace and wary for the next attack.

The sensation in the legs is characteristic and I believe is due to anoxæmia. It can be duplicated easily in the arm by the sphygmomanometer cuff. The interesting points are that the onset of this vascular sensation may follow the respiratory spasm so quickly and that the weakness is so marked. Yet recovery from these symptoms can be equally rapid. Further they are not inevitable concomitants of the respiratory difficulty. The circulatory discomfort in the thighs and legs cannot be ascribed to cardiovascular disease, for in my free phases I can play vigorous tennis, squash, or golf without distress.

When the exigencies of practice prevent my having any exercise, *attacks are more frequent and severe.* I am convinced that every asthmatic should exercise regularly, and best under supervision so that activity can be properly graded. Loose arm-swinging exercises are admirable and should be done on rising and retiring. When I remember I practise them myself. Even when some degree of dyspnœa is present, loose arm-swinging in the widest arcs can be done, and will indeed help by improving thoracic circulation and "unlocking" the accessory muscles of respiration.

This again leads to another sign of the disorder, the *characteristic posture and contraction of thoracic muscles* during a bad attack; the shoulders are hunched, the dorsal curvature exaggerated. In a severe attack one grasps a bed-rail or the top of a high chair above one's head to pull up and support the chest. The "posture spasm" is extremely fatiguing and if not resolved adds greatly to the discomfort and distress of the attack. In my own case, and in many others I have observed, the correlation between rib and diaphragm movement seems to be out of step. It is very difficult—though not entirely impossible—to correct all this muscular irregularity oneself. Great relief is often experienced at once if the patient sits up and someone in the gentlest fashion supports his occiput and chin in either hand, directing the head upwards and slightly forwards, keeping the chin in. Then gentle manipulation of the levatores anguli scapulæ and supraspinati and muscles of the shoulders can considerably loosen the spasm. Properly synchronised pressure on the pit of the stomach helps to regularise the rhythm of breathing.

When dyspnœa is severe, emotional control is strained. I want to ask for something but am forced to gasp out only half the sentence. If this is not understood, or the request not complied with statim, I become disproportionately angry. This intensifies the difficulty of breathing, giving a good example of a vicious circle. I have observed this in others who equally with me recognise that the exasperation is irrational but still cannot control it. I regard this irritability in common with other distress symptoms, as resulting from anoxæmia. For this reason oxygen, with a little carbon dioxide, seems to be indicated early in any case of status asthmaticus.

Short of these severe attacks, which confine one to bed or to the house, there are long periods when asthma is, as it were, constantly round the corner. For hours one is conscious of one's breathing, though it is not unduly difficult; then a stimulus sets off a spasm. Recourse to the atomiser staves off the attack and in a few minutes one is reasonably normal again. This recurs again and again through the day, and bed-time brings the apprehension of a certainly disturbed night.

Bronchitis is a common concomitant. Probably a low-grade chronic *bronchitis is present in nearly all* asthmatic sufferers. A fresh superinfection may set up an acute attack, with a temperature, copious purulent sputum, cough, and a very cacophony of respiratory accompaniments: There is usually continual asthma but not quite to the extent of being a true status asthmaticus. The net result is an unhappy one for the patient.

Among my experiences with therapy I can list a operation on my turbinates, extensive trials with ever remedy taken by mouth (including all the new anti histamine preparations), protein desensitisation, specia diets, psychoanalysis, and treatment by an eclecti psychiatrist. All these were quite fruitless, and the thre psychiatrists who interested themselves in me hav destroyed my faith in the existence of any scientifi approach in their branch of medicine. (Of course th sampling error is tremendous, but I can't help a convic as strong as this one is.)

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A few years ago I tried a proprietary inhalant bas on a German product. This contains methyl atropi nitrate, papaverine hydrochloride, adrenaline, chlorbut and *pituitary extract, and is administered* by inhal the atomised mist. If used promptly enough, halts most of my attacks even though they may re again soon. This particular preparation is the palliative I know, and I have yet to find an asth who is not helped by it. The response of course var widely, but generally a good degree of relief is obtain and many people can greatly extend their activities its aid. For myself it makes life a deal more tolerab Now I depend on it almost entirely, my only other ai being tea drunk as hot as possible.

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"... It would not ... be an exaggeration to say that fo many patients today are seriously overinvestigated; that fo lack of careful personal and social histories many unnecessary investigations are daily carried out; that insufficient thought is often given to the question of how far necessity and how far curiosity are the compelling motives in applying multiple and frequently uncomfortable tests; that surgery is often too lightly resorted to; that many patients are hopelessly confused by the numerous *examinations* and the visits paid to them by a variety of hospital officers and by the seeming lack of a warm, individual, personal interest in them; and that many are discharged at the end of their sojourn in hospital without any clear idea as to what is the matter with them, what their prospects are, or what their future treatment is to be ... we can no longer justify what is often, in the first place, an unscientific, in the second (from the patient's point of view) a too exacting, and in the third a too costly system of diagnosis. ..."—Prof. J. A. RYLE, *Brit. med. Students' J. Autumn, 1948, p. 6.*

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". . . It would not . . . be an exaggeration to say that many patients today are seriously overinvestigated; that fol lack of careful personal and social histories many unnecessary investigations are daily carried out; that insufficient thought is often given to the question of how far necessity and how far curiosity are the compelling motives in applying multiple and frequently uncomfortable tests; that surgery is often too lightly resorted to; that many patients are hopelessly confused by the numerous examinations and the visits paid to them by a variety of hospital officers and by the seeming lack of a warm, individual, personal interest in them; and that many are discharged at the end of their sojourn in hospital without any clear idea as to what is the matter with them, what their prospects are, or what their future treatment is to be . . . we can no longer justify what is often, in the first place, an unscientific, in the second (from the patient's point of view) a too exacting, and in the third a too costly system of diagnosis. . . ."—Prof. J. A. RYLE, *Brit. med. Students' J.* Autumn, 1948, p. 6.

d or listen to the Light Programme until lights out 9 P.M. Why could we not have our husbands with us? hat is the rationale of visiting altogether? Why do iting hours vary so much from one hospital to another? have just heard of two first-class hospitals where sbands can visit on seven evenings a week.

Then there seemed to us to be a conspiracy of silence er our condition, the proposed treatment, and the gth of our stay. Patients were often in the dark as why they were in hospital at all, and would lie with s anxiously cocked during the professor's or specialist's side lecture. One young woman, who had been in ward for five weeks, suddenly caught the ominous rd "toxæmia," was treated to a lengthy discussion possible complications, and left, presumably with ring blood-pressure. Patients often surreptitiously nned their case-notes or tried to question the students. usemen were much too pressed for time to answer uiries.

A similar disregard of the patients' point of view was wn in the experiments performed on them. These re in some instances accompanied by unpleasant er-effects. They were always resented; although no ient had the courage to object openly. The real evance was that patients were not asked for their sent; I am sure this would rarely have been refused the purpose of the experiment had been explained them. Patients called the ward "guineapig ward" d were often worried in case the experiment might ve "harmed the baby."

Food was sometimes adequate, but often insufficient uneatable; during all the time I was in the ward doctor, sister, or matron ever inquired about it. ing called at 5 A.M. meant that one never had quite ough sleep; I suppose this is unavo dable. But lure to provide such small comforts as a daily delivery newspapers or the collection of patients' letters shows at it seems to be no-one's business, in an otherwise del hospital, to consider the patient other than from e obstetric point of view.

EX-PATIENT.

INDEPENDENCE IN RESEARCH

—Professor Twort in his letter on Oct. 16 has a valuable reinforcement of the argument for idual research uncontrolled by Ministerial or other direction.

my speech on the second reading of the National lth Service Bill (*Hansard*, May 2, 1946) I commented the clause which describes provision for medical earch.

I drew the attention of the House "to one of the gravest roaches to be made against the Bill—namely, the icrously meagre reference to research. Nine lines of the ll, in clause 16, deal with medical research. . . . Let us what the Bill says on the subject of medical research. ill quote from the statement in the white-paper, and the ite-paper everywhere seeks to give the most favourable erpretation of the clauses of the Bill. The first sentence ikes me as being rich in humour. It reads: 'The Minister lso expressly empowered by this Bill to conduct research'—at is, medical research. One might, I submit, as reasonably troduce a Bill expressly empowering the Minister of Health navigate the *Queen Mary* from Southampton to New rk. How diametrically opposed is this conception of edical research dictated from Whitehall to the procedure opted at voluntary hospitals which have been the sources medical advance. This procedure, which has produced ults that have placed Britain in the very vanguard of vance in the science and practice of medicine, owes its ccess to the complete freedom which it gives to the staff. ur method is to pick a good man—and voluntary hospitals tract the best men and women—and when found to turn m loose in the wards or the laboratory as the case may be. he idea of directing research from a State department appears diculous to one who has been trained in the voluntary-ospital tradition." I then cited the achievement of Sir mroth Wright and Sir Alexander Fleming, from my own ospital, St. Mary's, as illustrations of the value of complete berty in the prosecution of research.

A very striking instance of the deplorable effects of olitical control on scientific research is cited in the narrative recently published in the *Times* of the deterioration already evident from the activities of Lysenko in Russia. His doctrines, universally rejected by authorities outside Russia, are foisted by Moscow on scientific workers under its control, with disastrous results to the whole economy of the country.

House of Commons.　E. GRAHAM-LITTLE.

STANCE FOR FEEL

SIR,—In the lecture you published on Nov. 6 Lord Horder has done it again. "Eclipse is first, and the rest nowhere" when telling us how to conduct clinical medicine and to apply to it the evidence from "instruments of precision" and laboratories. But he uses one word in a way that needs amplifying. It is the word "touch." It includes the two sensations of "touch" and "feel." In writing this I make no criticism of Lord Horder. His generation had not distinguished them. It was left for ours—reckoning a generation in medicine as ten years.

Those physical signs of which the evidence goes to the central nervous system by the afferent nerve-fibres from the muscles and ligaments, are quite distinct from those in which it passes from the nerve-endings in the skin. Whether any of our sensations can function without muscular action may be doubted; it is certain that the proprioceptive ones cannot do so. There is a conscious isotonic contraction of approach followed by a sustained isometric one.

If we examine ourselves when making observations of feel we find that:

1. The physical signs resulting from them are best elicited when the muscular contractions of the upper limbs are made with the joints flexed—including pronation.
2. They are less good when made with the joints extending—including supination.
3. The proprioceptive sensations are least efficient when the joints of one upper limb are extending and those of the other are flexed.
4. The efficiency of their action is increased when the pectoral girdle is evenly balanced upon the chest.
5. They become still better when the trunk is evenly balanced upon the lower limbs.
6. The acme of their efficiency is reached when, the above being followed out, the joints of the lower limb are flexed—including internal rotation of the hip-joint with inversion of the foot.

It is noteworthy that, when the observer has reached this position, he has taken up that of the water-diviner.

Certain deductions for the guidance of clinicians may be made from these observations.

(*a*) In any examination involving the use of the hands a position should be taken up, whenever possible, in conformity with these rules, at least as far as the balance of the shoulder girdle upon the chest.

(*b*) If the examination is one of extreme delicacy, or of great importance, the position which gives the acme of efficiency should, if possible, be assumed.

(*c*) If, for some reason (as when decency forbids) the best position cannot be taken up, the examiner should assume the position that most nearly approaches it.

(*d*) Examination involving extensor positions of the upper limb should be avoided if possible, and one which employs extension on one side and flexion on the other should never be used, unless quite unavoidable.

(*e*) Any sloppy stance or general slackness of the muscles is bad medicine; just as it is bad to make observations of sight without efficient lighting when this is available, or to talk to a third person while auscultating a chest.

(*f*) The patient should always be put in a position in which the clinician can efficiently approach the part to be examined, unless pain, deformity, or other clinical conditi n forbids.

(*g*) While general rules for the position of patients may be laid down in accordance with these principles there will still be a variation, personal to the examiner, according to the way in which he uses his upper limbs.

(*h*) The nurse should therefore place the patient in the position asked for by the examiner. She should show no sign of unwillingness by word, facial expression, silence, or jerkiness of movement when asked to do this for the individual examiner rather than according to

Letters to the Editor

BLOOD FOR TRANSFUSION

SIR,—The last sentence in your leading article on Oct. 30 states that "criticism comes best from those who help it most." Although I have only helped a little I beg space in your columns.

I have maintained a blood-transfusion service from this hospital for 15 years. I have met the needs of this area during that period and have never once, day or night, failed a doctor or hospital. During the 31 days of last month, for example, I called up 119 donors at short notice at all hours of the day and night. During the same month I was also responsible for supplying 1265 bottles of blood to the north-east London blood-supply depot team who toured Colchester and this district. During this period I took 5 bottles from the team for our own immediate needs, and these 5 are the only bottles I have ever taken from another source. In addition we have built up a Rh-negative panel of over 200 donors, most of whom are on the telephone or have made arrangements with a neighbour who is on the telephone. The above information, coupled with the fact that my name was mentioned in recent correspondence in your columns, is the excuse of a layman for writing to a professional journal.

I agree that very few donors would wear a badge. It is my invariable practice to tell donors that the donor who has just given blood is the best possible person to enrol new donors. It is, however, always difficult to persuade them to talk to their friends. In any case, I think the badge would be worn for a week and then replaced by the badge of the local football club.

I endorse every word in support of those hard-working people of the blood-supply depots. They are treated by the Ministry of Health as the Cinderella service. They are given old Army blankets, A.R.P. stretchers, and broken-down converted Army lorries with badly worn tyres. They travel about the country sitting in draughty lorries on crates of bottles, or something equally uncomfortable. Their personal comfort is not considered at all. They have an inadequate maintenance allowance when they are away; so they have to think carefully before they can book up at an hotel in any decent locality. It is most disturbing to see doctors and trained nurses acting as furniture removers and labourers. They must be given good, sound, reliable vans painted in distinctive colours, and they should have specially made white coats with a special device or badge on it. They must be given decent couches, clean white blankets, and plenty of clean pillows which can be changed 3–4 times a day if necessary. The Ministry of Food should be told that the refreshments should be "ad lib." If a donor wants 6 cups of tea and 12 biscuits, why should these not be provided? I hope that you will press this matter so that a very much overdue change may be made.

A lot more work needs to be done to instil into the doctors and hospitals that they must ask for the correct blood group and not always for group O. Homologous-group transfusions are nearly always given in this area; an occasional pint of A or B may be given to an AB recipient in grave emergency, but this has only happened once in 12 group-AB transfusions. For over three years now the pathologist here has typed and ascertained the rhesus status of all patients, male or female, who have transfusions, and automatically sera for cross-matching are taken and filed in a special container. Cross-matching is never omitted. Only in the direst emergency is the Rh status not ascertained, and on these occasions Rh-negative blood has always been given. Every pregnant woman in Colchester and district has the group and Rh status tested immediately she attends the antenatal clinic.

The only "blood bank" which we maintain is 2–4 bottles of group-O Rh-negative blood; and because of our quick call-up methods we have sufficient Rh-negative blood to meet all needs all the year round without any wastage; we also have one or two to spare for other hospitals in grave emergency. Many ex-Servicemen refuse to become blood donors because they have seen blood wasted in the Services, and it is becoming increasingly known by the lay public that time-expired blood cannot be made into plasma. Large towns and blood-supply depots are able to maintain blood banks without waste, but the small hospitals and the rural areas cannot; and a quick call-up is then the only solution. Furthermore, it is sound practice to call up a donor quickly; the average donor is a good sort and does not mind being inconvenienced to help save the life of a person gravely ill. I have never yet known a donor refuse a call, day or night, and I have never yet me an employer who refused to release a donor for a emergency call; and I speak from the experience o about 13,000 emergency calls.

All our donors receive a printed card giving the resul of the transfusion, even when the patient dies. These cards are very valuable indeed. I am convinced that all towns and centres took the same line and becam self-supporting, with emergency donors to supply the daily needs, and if they organised their surplus dono who cannot respond to emergency calls, they co then supply blood depots with a considerable quanti of raw material for plasma. There would thus be enoug blood and plasma for areas which cannot be organise and there would be a corresponding reduction in th calls for plasma from the blood depots. It is the onl *satisfactory answer for remote districts, as the bloo* depots cannot serve these areas quickly.

We maintain our emergency panel by rigidly adheri to the following rules:

1. A special department is operated under a trained sist who is also responsible for seeing that the apparatus is proper cleaned, packed, and delivered to the wards and theatr By this method donors do not get the impression that th are upsetting routine, as they do when suddenly deposit into another department of a hospital.
2. Comfortable couches and pillows are provided.
3. Adequate rest and plenty of tea are assured.
4. A house-officer, sister, or senior official always than the donors personally.
5. Donors are fetched and returned by car.
6. Donors are never kept waiting and are never left alon
7. Only persons skilled in taking blood are asked to ble donors; and unskilled ones are properly trained. A hou surgeon is never suddenly confronted with a donor if he h had no experience in doing this work. A donor return to a factory with a bruised arm or with a hæmatoma is a just one donor lost; he talks about it and a dozen are lo

By these methods we have only had one "faint" i three years.

I sincerely hope that you will press these matters i your columns so that a change may soon be made i this vital service.

Essex County Hospital,
Colchester.

ALEC E. BLAXILL
Blood Transfusion Officer.

HOSPITAL MANNERS

SIR,—I have just returned home after four weeks i the antenatal ward of one of our finest teaching hospitals and would like to add one or two points to your leade and the article to which it referred.

My outstanding impression is one of contrast betwee the superb quality of the surgery and anæsthetics an the failure to consider the human and personal problem of the patient. We were fortunate in having a friendly, cheerful, and efficient staff of nurses; but their powers, after all, are limited. We were all expecting babies; we all had anxious husbands; and our chief complaint was that visiting hours were inadequate.

There were three official visiting days, on two of which we were allowed visitors from 4 to 5 P.M. and again from 7.30 to 8 P.M. Most husbands were at work during the afternoon hour, which left them a half-hour visit on two evenings and one hour on Sunday afternoons. Saturday afternoons, when most husbands were free—and incidentally no teaching was done and the wards were deserted—we were allowed no visitors at all. Even a switch of evening visiting to two days on which we had no afternoon visitors would have made a great difference to our spirits, but this did not seem to have occurred to anyone.

By 7.30 every evening we were all washed, fed, tidied, and on five evenings were left with nothing to do but

THE PART-TIME SPECIALIST

SIR,—Mr. Deitch, in your issue of Nov. 6, draws me comparison between specialists doing limited part-me work in hospitals and "the full-time specialists, ho have no time-limit to the hours worked." Without shing to enter into his discussion of the relative entitle-ents of each group to undertake domiciliary visits, should like nevertheless to say a word for the part-time ecialist.

His remuneration is for an inpatient or outpatient ssion of $2^{1}/_{2}$–3 hours, although this session may in fact metimes last twice as long and leave him no time for her work that half-day. If ever he makes any extra sit to his hospital for a special purpose, but for less an the statutory period, he is apparently entitled to extra payment. His usual visits are all likely to be dealing directly with patients and perhaps teaching out them. No remuneration is likely to be given for e spent in hospital for other purposes, such as tendance at joint clinical conferences, operations, or topsies, performance of special investigations, and aling with departmental correspondence. The full-time orker is at least in the enviable position of being better le to use his time profitably, in all senses.

The part-time worker must search his conscience as whether or not he is justified in claiming as a " session " e extra odd hours in the week which he spends at spital, either through overtime routine work or rough the additional duties which he cannot and should t escape, if he is to add to his knowledge and improve work. Payment on the basis of attendance at a nted inpatient or outpatient session takes no account much more that is—or at any rate has been—willingly ntributed.

EX-SERVICE SPECIALIST.

GROUP PRACTICE

SIR,—" Consultant " is probably right in condemning oup practice, but he misses the point entirely. A man th his fellowship doesn't go into general practice as vocation; he does so for a livelihood, hoping one day be a whole-time consultant. Meanwhile he operates. It is probably easier for a camel to go through the of a needle than for a G.P. to be appointed to the of a general hospital and be allowed to devote all nergies to a surgical specialty.

stown, Cumberland R. RUTHERFORD.

THE MEDICAL CIVIL SERVICE

SIR,—Recently commenting on the greatly increased scription-rate under the National Health Insurance me, Mr. Bevan is reported to have said: "Because ings are free is no reason why people should abuse r opportunity," and "People must not rush to tors when they do not require the doctor. We do t want to build up a nation of hypochondriacs."

The truth is that things are not free, and Mr. Bevan ould not abuse his position and intelligence by pre-nding that they are. The average individual, who ds that he is paying some £10 a year in National ealth Insurance, not being a Government department, d thus used to the idea of operating at a loss, will turally wish to make the system pay, and will be mpted to rush to the doctor on the least excuse, en formerly he might have thought twice about doing . Our own native good sense can eventually be relied pon to prevent our becoming a nation of hypochondriacs der a system whose natural tendency is to make us ch.

Another example of Mr. Bevan's tortuosity is his ported statement in the House of Commons that the umber of doctors joining the National service is a gn of the faith they have in the Minister's word. The act, of course, is that, shrewdly not relying on so nadequate a motive, the Minister's economic threat of no compensation to those joining after July 5 furnishes a much more obvious explanation of their actions.

Equally humorous are Mr. Morrison's recent remarks about " our determination that Britons never shall be slaves."

Well, after the recent struggle for the liberty of the medical profession, there is peace among medical civil servants, but it is the peace of slavery. With the Minister of Health as the sole ultimate employer, and with no possible appeal to the courts against wrongful dismissal —a tyrannical right which he has insisted on acquiring —the writer's request for anonymity (repellent in a free society, but forced on him in self-protection) is a measure of the social change since July 5.

London, W.1. CHIRURGICUS.

*** If in nothing else, our correspondent is mistaken in supposing that the average person is paying some £10 a year in National Health Insurance. The portion of his weekly National Insurance payment which is devoted to the National Health Service is 8½d., or 10*d*. if he is self-employed.—ED. L.

Parliament

Shortage of Nurses

IN the House of Lords on Nov. 9 Lord CROOK, in calling attention to the grave shortage of nurses, said the matter was one which we ought to look at in relation not only to the nurses themselves but also to our own efficiency as a nation. He was convinced that the success of the new health service would be determined by the number of our nurses. The shortage was no sudden event; it had existed since the end of the first world war. Today we had more nurses and trainees in the hospitals than ever before, yet we also had a graver shortage. Although there were 7000 more nurses employed than a year ago, and 31,000 more than in 1938, and although there were 51,000 student nurses training in hospitals today as against 43,000 in 1938, the shortage persisted. At the appointments office of the Ministry of Labour 33,000 vacancies were now registered, and hospital committees estimated that to meet present-day needs 50,000 were needed. But even that fell short of the number needed to carry out essential reforms and to provide for the potential growth of the health service. The lowest estimate of those needs was a further 25,000, to which must be added the nurses needed to make good the ordinary annual wastage, perhaps 10,000 a year, from the loss of student nurses and ordinary resignations.

The public failed to realise that over the last half century our nursing service had grown right out of its former relation with the growth of the population. A nursing service of 68,000 at the beginning of the century had been increased to 191,000, partly because of the expanding population but largely because of our new conception of social care and welfare. We began the century with a hospital or nursing service based mainly on the treatment of the sick poor. We had now developed an all-in nursing service covering many things other than institutional treatment. Indeed only some 60% of our nurses were engaged nowadays in institutions; the other 40% were employed in new health services related to prevention and care. School nurses, for instance, who were not known until 1908, now numbered 2500, or 1 nurse for every 2000 children, and we hoped to achieve a proportion of not more than 1000 children to each nurse. There were also the demands of the health-visitors scheme, the infant-welfare centres, nursery classes, tuberculosis dispensaries, blood-transfusion services, and rehabilitation centres. Lord Crook also emphasised the needs of the industrial health service and pointed out that the 7000 nurses deployed in that work at the end of the war had now dropped to 4000.

The Working Party, he continued, had made it clear that it was not true that pay was the fundamental difficulty in the nursing profession. What was wrong was that the ancient idea of the cloistered life of the sister, on which the nursing service was based, was continuing far too long. No doubt the nursing profession would remain on a loftier plane than many others, but it must be moulded to the new conceptions of personal freedom that had swept over this country in the past 25 years. The nursing profession had no more right to encroach on the personal life of its members than any other profession. He did not deny that a good many rules were necessary in running an institution which has the responsibility for young girls sent by their parents for training. But there ought to be some sense of balance between two extremes. To achieve it would be one of the tasks of the new management committees. The

the rule; for the unwillingness may be transmitted to her patients, to their detriment.

(i) Movement of a bed or other furniture must never be avoided, for fear of giving trouble, if it is necessary *to allow the examiner to take up a proper position.*

Great clinicians always put themselves in these postures by the light of nature; but we are not all great clinicians; and we need thought, and conscious attention to detail, in order to approach their standard of inefficiency.

London, W.1. T. B. LAYTON.

INFECTION THROUGH SOAKED DRESSINGS

SIR,—Sterile non-absorbent cotton-wool has many of the properties required by Dr. Colebrook and Mr. Hood (Oct. 30). A thick layer placed on the outside of the absorbent cotton-wool dressing will keep the exterior of the burn dressing dry for a long time. Sterile non-absorbent cotton-wool has been used as a bacterial air-filter for many years. I believe the U.S.A. shell-dressing used to consist of a pad of absorbent cotton-wool backed by non-absorbent cotton-wool. The two layers were surrounded by gauze.

Bradford. *J. A. MYERS.*

ACCIDENTAL INTRA-ARTERIAL INJECTION OF DRUGS

SIR,—Mr. Cohen's letter last week in reply to my criticism (Oct. 2) of his paper accuses me of "flaunting certain physiological facts," and misconstrues what I said. I did not suggest that the effects of the injections he describes were due to vasodilatation in the tissues or to trophic nervous activity, as he states I did; nor did I make the ridiculous suggestion he attributes to me that thiopentone in the cases under consideration was injected solely into a nerve without entering the circulation. Obviously it did go into the circulation, but the very delay before the onset of unconsciousness, which Mr. Cohen pointed out is usual in these cases, indicates that the entry into the circulation is abnormal. All I suggested was that some of the injection irritated nerve-fibres.

Mr. Cohen does not believe vasodilator fibres supply the skin, but how does he explain the effect of stimulation of the peripheral ends of the posterior nerve-roots and the axon reflex of Lewis? Such stimulation causes the phenomenon of herpes zoster in the affected skin and œdema in the deep tissues. Unmyelinated vasodilator nerve-fibres of cholinergic type have been shown to be responsible for this and for the vasodilator effects, in a completely sympathectomised animal. If Mr. Cohen is not acquainted with severe œdema and ulceration as "trophic lesions" he can find references to this in any neurological textbook—e.g., Bumke and Foerster's *Handbuch der Neurologie*, vol. 5, or Wilson's *Neurology*, where the effects of irritation or section of the peripheral nerves are described. Œdema and trophic sores following irritation of the posterior nerve-roots are well seen in cases of herpes zoster, which may be followed by œdema and gangrene of the affected tissues and skin (see Bumke and Foerster). Ophthalmic zoster produces tremendous local œdema in the orbit and eye and often arterial and venous thromboses in the retina. If Mr. Cohen does not believe that 'Proctocaine' injection into peripheral nerves causes immediate vasodilatation and constriction both locally and at a distance, I suggest he should try such an injection for himself, as I have done on numerous occasions in the treatment of severe neuritis.

Mr. Cohen is somewhat naïve in suggesting that the intraneural injection would be required to be made into all the nerves of a limb in order to produce the symptoms he described. Concussion of a single nerve, as in causalgia resulting from bullet wounds, causes "trophic changes" and produces wasting and sensory loss in tissues supplied by nerves not directly damaged. Moreover, Mr. Cohen does not seem to be familiar with the phenomenon of ascending œdema of nerves, whereby the œdema due to damage to a single nerve branch ascends and descends the nerve to involve the nerve-roots of origin and other branches of these roots, and also roots entering neighbouring parts of the cord. If Mr. Cohen still does *not believe* that injections of drugs into peripheral nerves produce the effects he describes, I recommend him to read A. D. Speransky's *Basis for the Theory o Medicine* (1935), in which the effects of the application of drugs and chemicals to peripheral nerves in dog *and other animals are* described at length. It produce changes both in the affected and opposite limb identica with those he records.

As regards the effects of acetylcholine on clotting made this statement as a result of personal observation which will be published later. In my letter I carefull did not mention liberation of acetylcholine into th circulation, but "in the blood-vessels"—meaning i the walls. Mr. Cohen's quotations on the effect acetylcholine injection into the circulation are th irrelevant. Acetylcholine liberated in the walls blood-vessels leads to œdema of the vessel walls, as does when it is liberated in other tissues, such as t skin or any tissue into which it is injected. It is th œdema of the blood-vessel wall which predispose clotting. The effect is not directly on the blood. Su phenomena are well seen in the retinal thrombo complicating ophthalmic zoster.

To conclude, I repeat that in spite of all Mr. Cohen belligerency the criticism remains that he still has n shown that intra-arterial injection took place in the cas he described. Some of those who supplied him wi cases stated that they believed the injections we intravenous, yet he assumes they must have be intra-arterial without adequate proof. Intra-arter injection of thiopentone is usually harmless. I am n sure which hypothesis Mr. Cohen considers dies honourable death, but I hope it is his own.

London, W.1. R. WYBURN-MASON

APPLICATION FOR HOSPITAL POST

SIR,—Your correspondent "A.B." in the issue Nov. 6 mentions a point over which many people app to get confused.

The hospital with which I am associated sometim advertises house-officer posts as "A or B2." This mea that the hospital would prefer to appoint someone w not less than six months' previous experience, but th if the most suitable applicant is a newly qualified prac *tioner without previous experience he will not be* ent to B2 status and pay which allow for experience tha does not possess. It sometimes happens that all t applicants are without postgraduate experience.

Bishop's Stortford. RAYMOND HILL

THE BALLISTOCARDIOGRAM

SIR,—I was greatly interested in the annotation this subject in your issue of Oct. 30.

In 1917, when I was a member of the special board f the selection of pilots for the Royal Flying Corps, utilised, for weighing the candidates, an adapted penn in-the-slot weighing-machine. I noted that the nee pulsated synchronously with the pulse-rate. Anyo can satisfy himself of this fact by the expenditure of copper on any similar apparatus. This observation le later, to a small joint investigation with Major W. Tucker, D.SC., R.E., which culminated in the presentati of a paper to the Royal Society, entitled Recoil Cur as Shown by the Hot-Wire Microphone.[1]

In this communication *the subject is portray* standing; subsequently we found that far better resul could be obtained by a suspended couch, the horizont movements being controlled and standardised by pia wire tensed to the middle C. In the communicati a variety of curves are illustrated showing the effe of exercise, breathing, &c., also the correlation of the curves in relation to the electrocardiograph curves an heart sounds. Unfortunately, this interesting piece work had to be abandoned owing to staff changes an finance stringency in the civil-aviation department the Air Ministry; and, as far as I know, nothing furth has been done.

I have, however, always felt that there was a valuab place for this method if properly developed, since as Major Tucker shows, these recoil curves lend them selves to ballistic analysis. Incidentally I consid "recoil curves" a better name.

London, W.1. C. B. HEALD.

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[1] Heald, C. B., Tucker, W. S. *Proc. roy. Soc.* B. 1922, 93,

Free Medicine for Private Patients

r Wavell Wakefield asked the Minister if in view of refusal to permit private patients to obtain pharma- ical services free of charge he would withdraw the phlet, *The New National Health Service*, in which it was ed that any person could use the whole or any part of the ice; and, in view of this misleading statement, if he would a new pamphlet giving a factual statement of what le were entitled to receive.—Mr. Bevan replied: People perfectly free to use any part of the service; but there be a limit to the extent to which parts can be sub- ied. I should not feel justified in supplying medicines or ances ordered by doctors who were not taking part in ervice and are under no obligation to observe its rules.

r Wavell Wakefield: Is the Minister aware that many le feel that they are being grossly misled by this circular; s he further aware that people feel that, having paid for ervice, either directly or indirectly by taxation, they are led to receive a part of the service, as stated in the lar, free of charge?—Mr. Bevan: I am under an obliga- —and I should have thought that I should have been orted in this by all members of the House—to defend nditure. It ought not to be possible for a doctor who t in the service, and therefore not subject to the discipline e service, to prescribe for his private patients. Sir ell Wakefield: Is the Minister aware that it is not the es but the patients about whom we are concerned?— Bevan: A patient has the remedy in his or her own hands oin the service.

Plastic Spectacle Lenses

r. Charles Smith asked the Minister whether he proposed rovide spectacles with plastic or other unsplinterable s under the National Health Service either for all who red them or for any special categories of users.— Bevan replied: I am considering whether it is possible pply unsplinterable lenses under the National Health ice and, if so, what conditions should apply.

Earnings of Dentists

homas Moore asked the Minister what were the average earnings of dentists under the National Health —Mr. Bevan replied: I am afraid I am not yet in a to supply this information. I have always made it the dental organisations that while there is no question g back on the Spens report, I intend to check the of the various operations (on which fees are based) the scheme has settled down.

added that over 85% of the dentists in the country already in the service, which was evidence, he thought, the dentists were satisfied.

Resignations from School Dental Service

r. Barnett Janner asked the Minister of Education had been the effect on the school dental service of the duction of the National Health scheme; and what he was taking to ensure the retention of sufficient sts for the school dental services under the new arrange- s.—Mr. George Tomlinson replied: A good many l dentists are resigning to set up practice under the nal Health Service and recruits are not coming forward l their places. In consultation with the Minister of th I am giving close attention to the means of securing ment of the salaries of full-time dentists in the oyment of local authorities.

Hastings: Is it not a fact that those dentists who the school service can make at least double the income de, and is not the right course to raise the salaries of the l dentists?—Mr. Tomlinson: I think I intimated that s the point to which we are giving attention.

Family Allowances

r. Arthur Lewis asked the Minister of National Insurance would state the total number of family allowances that paid and cash received by recipients.—Mr. Tom Steele ed: At Oct. 25, 1948, approximately 2,850,000 families receiving family allowances in respect of 4,530,000 ren in Great Britain. This represents a weekly payment ther over £1,100,000.

Obituary

JOSEPH BLOMFIELD

O.B.E., M.D. CAMB., F.F.A. R.C.S.

Dr. Blomfield, consulting anæsthetist to St. George's Hospital and for many years editor of the *British Journal of Anæsthesia*, died in London on Nov. 9.

Born in 1870 in London, the son of Louis Blumfeld, he was educated at University College School and at Caius College, Cambridge, where he took the natural sciences tripos in 1891. Three years later, after completing his clinical studies at St. George's Hospital, he graduated as M.B. Camb., proceeding to his M.D. in 1897. In the same year he was appointed anæsthetist to several London hospitals, including the National Dental Hospital and St. Mary's where he was also a teacher of his specialty. Later he also joined the staff of the Grosvenor Hospital for Women and Children, the Metropolitan Hospital, and the King Edward VII Hospital for Officers. At his own hospital he became senior anæsthetist and lecturer in anæsthetics, and he was the author of the history of the hospital which commemorated its bicentenary in 1933.

[Elliott & Fry

With this background of wide and varied experience Blomfield's counsel and judgment commanded respect at the committee table. As early as 1910 he was a member of the anæsthetics committee of the British Association, and he long held office as chairman of the anæsthetics committee of the Medical Research Council and the Royal Society of Medicine. He also served as president of the anæsthetics section of the society and as president of the Association of Anæsthetists. When the Royal College of Surgeons instituted its new faculty of anæsthetists he was one of the first fellows to be elected. Practising through years of revolutionary change in anæsthesia, he played a considerable part in developing and stabilising new methods, towards which his attitude was welcoming but cautious. He was, for example, one of the first in this country to explore the uses of 'Avertin' (bromethol), on which he reported with Sir Francis Shipway in 1929.

Not the least of his contributions to his specialty was his editorship of its journal, to which he gave discriminating service till the war interrupted its publication. Beside writing chapters on anæsthetics for *Pye's Surgical Handicraft*, *Latham and English's System of Treatment*, and *Choyce's System of Surgery*, he published a textbook on *Anæsthetics* which reached a 4th edition in 1917 and was followed in 1922 by his *Anæsthetics in Practice and Theory*.

As an editorial contributor to our own columns, he was for many years a valued and entertaining colleague. In those relatively spacious times it was his habit to drop into the office after lunch, wearing a button-hole, smoking a cigar, and bearing a manuscript which could be deciphered only by the expert. (When he bought a typewriter the results were so remarkable that our printer begged him to return to the pen.) His notes on anæsthesia showed wit and judgment; and he was always prepared to write on other subjects, having a distinct journalistic talent as well as associations with Fleet Street. His vigour and zest for life were long almost untouched by the years, and it is said that until the beginning of the late war he ran round the Inner Circle of Regent's Park daily before breakfast. One Christmas after his retirement he answered an appeal from the Post Office and spent some strenuous days in loading vans with parcels. Later he had a serious operation, but he was able to return to a quiet life at his home in Isleworth, whence he reappeared once or twice a week to lunch with old friends at the United University Club and enjoy a game of bridge. He was, and remained, a companionable man, with a charm all his own.

girls might well, he suggested, be given more privacy inside the nurses' homes, better food, and shorter working hours. Domestic work should be taken away from nurses. To do this he recognised it would be necessary to tackle the shortage in domestic staffs by organising a system of grading with attractive terms and a uniform.

One of the tasks which he thought local consultative committees should assume was to get over to nursing staffs some new ideas. For instance the number of part-timers must be increased, whatever the staffs thought at the moment. We must make them understand that only by that means could the reforms be carried out and the present shortage reduced. He shuddered to think where they would be, particularly in the chronic hospital service, without the services of the 21,000 part-timers who had entered this employment during the past year or two. Another of the new ideas to which we must become accustomed was the extended employment of married women and male nurses, who must be eligible for promotion to some senior posts.

We must, Lord Crook ended, realise that we can no longer run the nursing services only on a Florence Nightingale tradition. They could still keep the tradition but nursing must be organised as a profession with proper terms and conditions which either sex could accept.

Lord Rushcliffe held that the major cause of the shortage of nurses was wastage during training, which amounted to something like 50 or 60%. No doubt many were from the start unfitted to be nurses, but he was satisfied that many left nursing because they felt frustrated. In his view the wastage would not be checked unless the responsibility for the training of nurses was separated from that of providing hospital nursing services. A nurse, like a medical student, should have opportunities of learning her job at the bedside, but at present she found that much of her time was taken up in doing work which ought to be done by a housemaid.

Lord Amulree pointed out that one of the things that had never been made very clear was what was the job of a nurse. Many patients did not need full nursing attention, some for instance went into hospital merely for investigation. He suggested that if some wards were turned into admission or investigation wards, many nurses could be freed to look after people who were more ill. Again, many surgical patients, 10 or 12 days after their operation, though not yet fit to return home, could do without full nursing care so long as there were no difficulties or complications. A third type of patient who could also free a good many nurses were the chronic sick in institutions all over the country. By encouraging the doctors to reable these patients it was possible to speed circulation in these wards and lessen the boredom of work among these patients for the nurse.

Lord Shepherd, Lord in Waiting, in reply, pointed out that there had been no diminution of the rate of recruitment in the profession. Thus we were not, he declared, confronted with the task of shoring up a decrepit institution, but to arrange for more rapid progress. Nursing staffs now totalled 180,000, or 28,000 more than ten years ago, and numbers were steadily increasing. Hospitals employed 52,000 trained nurses, and 44,000 other nursing staff. The number of students in training was 48,000. A further 16,000 nurses were employed by local authorities and about 20,000 in miscellaneous services and private practice. Nevertheless, of the 582,000 beds in hospitals, 64,000 were not provided with nursing services.

Shortages had arisen because more hospital beds were occupied than before the war. Many thousands of patients were waiting admission. The number of births had risen since 1940 and many more midwives were needed. Demands for nurses in other fields, such as industry and schools, had increased, and greater demands were being made by the Armed Forces. To meet existing needs and introduce a 96-hour fortnight 48,000 nurses must be recruited. The Government had lately circulated to management committees a red-book dealing with the recruitment and conditions of service of nurses, midwives, and domestic staff. The shift system was one of the ideas mentioned. The book was issued not only for guidance but represented the policy of the Government. The separation of responsibility for training from the hospitals was also being considered, and the Government's decision would be made known before long. They believed, Lord Shepherd added, that for training there should be some other authority than those who had merely the management of hospitals.

Male nurses, he continued, had increased from 10,000 in December, 1943, to 24,000 in June this year. The Ministry of Labour were active in the enrolment of men and women for the nursing service. They had so far placed 135,000 nurses and midwives in employment and training and were now placing them at the rate of 14,000 a year.

The recommendations of the Working Party had been carefully considered, and measures which could be taken immediately without legislation were being tried. These matters covered the selection of student nurses, the training of sister students, and the training of senior staff. The Nuffield Provincial Hospitals Trust was engaged on an inquiry into the duties of each member of the hospital team, the results of which should be of great assistance in the solution of staff problems. Presumably the point raised by Lord Amulree would be dealt with by that body. Some long-term measures would entail new legislation, and, as announced in the King's Speech, a Bill would be introduced this session. In the recruitment of staff part-time service was not being neglected. Between 7000 and 8000 trained nurses and about the same number who were not State-registered but had nursing experience, had recently returned to nursing work on a part-time basis.

QUESTION TIME

Basic Salary

Mr. Somerville Hastings asked the Minister of Health whether, in view of the fact that the granting of basic salaries under the National Health Service Act, 1946, was determined to a large extent by doctors who would themselves suffer financially if those were granted, he would take action to relieve these doctors of their invidious position.—Mr. Aneurin Bevan replied: It was the doctors themselves who asked for this modification of my original proposal. Mr. Hastings: Does not the Minister regard it as contrary to public policy to allow people to help make decisions in which they are financially interested?—Mr. Bevan: The doctors are always able to make an appeal to me against the decision of the executive council if they feel aggrieved.

Dr. S. Segal: Is the Minister aware that the local executive councils are doing their utmost to dissuade doctors from opting for the basic salary; and will he see whether it is possible to create a separate pool out of which these salaries could be paid so that any doctor who wished to have a salary could do so as a right, and without any means test?—Mr. Bevan: I doubt whether the local executive councils are the people who are trying to dissuade doctors from taking the basic salary. It may be that members of the medical profession locally attempt to dissuade the doctors. But if a doctor feels aggrieved he may appeal to me. If the profession wants an alteration in the procedure for which it asked itself it can appeal to me.

Cost of the National Health Service

Sir Ernest Graham-Little asked the Minister if he would give an approximate estimate of the cost of the National Health Service during the first three months of its operation.—Mr. Bevan replied: The total sums issued from the Exchequer in respect of England and Wales during the three months ended Sept. 30, to meet the cost of the service, amounted to £54,500,000 after taking into account receipts. These sums include working balances held by the statutory bodies operating the service and include provision for certain non-recurring items of expenditure arising from the taking over of hospitals.

Legal Report on Partnerships

Mr. Hugh Linstead asked the Minister whether he had yet considered the report of the Legal Committee on Medical Partnerships; what action he proposed to take on that report; and if legislation was needed, when it was likely to be introduced.—Mr. Bevan replied: I received this report on Nov. 8 and I am considering it.

d cards. The punch supplied for use with these cards only single-depth slots (fig. 1); double-depth slots must cut with scissors. In the department's workshop the h has therefore been modified by filing back the shoulders 2) leaving a step. Thus altered, the punch will cut s of single or double depth with equal facility and accuracy.

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ersity of Cambridge

e Raymond Horton-Smith prize has been awarded to David Verel for his M.D. thesis on postural hypotension.

ersity of Glasgow

Nov. 6 the degree of M.D. was conferred on Tom McEwan, the degree of PH.D on I. C. Michaelson.

al College of Physicians of London

W. H. Wynn will deliver the FitzPatrick lectures at college on Tuesday and Thursday, Dec. 7 and 9, at He is to speak on the Pestilences of War.

al College of Surgeons of England

a meeting of the council of the college held on Nov. 11, Lord Webb-Johnson, the president, in the chair, Mr. E. O. B. Robinson was elected a member of the court of iners. Prof. Henry Cohen was appointed Moynihan Mr. L. Crossfill (Epsom College and Barts) was ted as the 56th Jenks scholar.

plomas of membership, and in ophthalmic medicine and , in child health, and in physical medicine were red on those named in the report of the comitia of the College of Physicians in our issue of Nov. 6 (p. 753). llowing diplomas were also conferred :

M.R.-D.—C. J. Alexander, C. W. P. Bradfield, R. G. Britt, L. Conway-Hughes, A. M. Fraser, P. H. K. Gray, C. H. R. E. Lawrence, Ronald Levy, R. H. C. Manifold, Stephen D. W. Morrison, Richard Paul, J. McK. Reid, H. L. Ross, Spira, J. L. Steven, B. A. Stoll, D. R. Syred, E. J. S. R. F. Williams.

M.P.—I. G. Brown, H. G. Frank, W. D. Fraser, Robert Prabhat Kumar Haldar, Eileen H. Harrison, G. M. Holme, Jones, A. H. McCallum, J. R. MacLeod, R. D. Nash, Uma Prasad, T. M. Prossor, W. M. Ross, Nirode Bijali Roy.

Thursday, Dec. 9, at 5 P.M., Sir Reginald Watson-Jones iver the Robert Jones lecture at the college, Lincoln's ds, London, W.C.2. He is to speak on the Reactions to Metal.

College of Physicians of Ireland

Nov. 5 the following were admitted to the membership :

B. Gatenby, Manik Ghosh, R. J. Kernohan, R. M. Peet. Temple.

strar-General for Scotland

E. A. Hogan, an assistant secretary in the department lth for Scotland, has been appointed registrar-general , deaths, and marriages in Scotland, from Dec. 1. ssion to Mr. J. G. Kyd, who is retiring.

national Congress of Comparative Pathology

congress will hold its fifth meeting in Istanbul from 17 to 20, 1949. The congress covers all aspects of human, , and veterinary pathology, and considerable latitude itted in the choice of subjects for discussion. Further ation can be had from Mr. R. E. Glover (secretary of British national committee), Royal Veterinary College, n, N.W.1, or from Prof. N. R. Belger, Taksim, viler 75/3 Istanbul.

national Congress of Otolaryngology

This congress will be held in London from July 18 to 23, 1949, the presidency of Mr. V. E. Negus. Subjects selected discussion include Antibiotics and Chemotherapy in the tment of Nasal Sinusitis and its Complications, when the speakers will be Sir Alexander Fleming, F.R.S., Lionel Whitby, and Dr. A. C. Furstenberg (Ann Arbor); ment of Aural Vertigo, openers Prof. F. Nager (Zurich), C. Nylen (Uppsala), and Dr. W. J. McNally (Montreal); Non-malignant Strictures of the Thoracic Œsophagus. ers Dr. Gabriel Tucker (Philadelphia), Prof. J. Terracol pellier), and Dr. P. G. Gerlings (Amsterdam). On July 26 meetings will also be held at Oxford, Cambridge, Edinburgh. Further information may be had from the taries of the congress at 45, Lincoln's Inn Fields. don, W.C.2.

International Congress on Rheumatic Diseases

The seventh International Congress on Rheumatic Diseases, at the invitation of the American Rheumatism Association and the New York Rheumatism Association, is to be held at the Waldorf Astoria in New York from May 30 to June 3, 1949. The congress is sponsored by the International League against Rheumatism.

Health Scheme in Northern Ireland

The Northern Ireland minister of health and local government states that 730 doctors have joined the new service, which means that there must be very few general practitioners who are not taking part. Over 90% of the total population of Northern Ireland have registered. Few dentists have remained outside the scheme, 258 being in contract with the board for the provision of general dental services. The calls made by the public upon the dental service have been greater than were expected, and up to the end of October, 55,516 persons have had treatment completed.

Royal Society

A Royal medal has been awarded to Prof. James Gray, F.R.S., for his researches in cytology, ciliary movement, and particularly his anatomical and experimental studies of animal posture and locomotion. Prof. A. V. Hill, F.R.S., receives the Copley medal for his researches on myothermal problems and on biophysical phenomena in nerve and other tissues, and Prof. R. A. Fisher, F.R.S., the Darwin medal for his distinguished contributions to the theory of natural selection, the concept of its gene complex, and the evolution of dominance.

New N.H.S. Formulary

In announcing the forthcoming publication of a new formulary for doctors and chemists to use in the National Health Service, Mr. Hugh Linstead, M.P., secretary of the Pharmaceutical Society of Great Britain, said : "It is not a formulary prepared by the Ministry of Health under the cheeseparing eye of the Treasury. It has been prepared by a joint committee of the Society and the British Medical Association and will be submitted by it to the Ministry for official adoption. It does not provide for cheap medicine but for good medicine."

Welfare of Handicapped People

The Secretary of State for Scotland has appointed a council under the chairmanship of Lord Stevenson to advise him "on matters pertaining to the welfare of handicapped persons with particular reference to the provisions of the National Assistance Act." The other 18 members include Mr. W. Veitch Anderson, F.R.C.S.E., Prof. T. Ferguson, M.D., and Dr. J. G. M. Hamilton. The secretary is Mr. R. L. Hulley, Department of Health for Scotland, St. Andrew's House, Edinburgh, 1.

Conference Grants

The British Council has a small fund to enable overseas delegates to attend conferences held in the United Kingdom on scientific subjects, including medicine. Conveners of conferences to be held between April 1, 1949, and March 31, 1950, should apply to the director, visitors department, British Council, 3, Hanover Street, W.1, giving particulars of their conference and the number of delegates (and their nationalities) who they think will need help. Application should if possible be made before Jan. 15 next.

Patronage of Hospitals

In the management of hospitals under the National Health Service Act, offices such as president and vice-president, which imply executive responsibilities, will not be continued. But the Ministry of Health points out that there is no reason why committees and boards should not invite those who have held these offices, or others, to accept appointment as patron, vice-patron, or honorary president. It is understood that the King and the Queen, and other members of the Royal Family who have hitherto been patrons or vice-patrons of hospitals, will continue to act in that capacity without any steps being taken by the committee or board concerned. It is understood that where they have been president or vice-president they will be prepared to consider an invitation to become a patron or vice-patron in future; or where they have had, or wish to have, a particularly close tie with an individual hospital, an invitation to become honorary president.

Dr. Blomfield was twice married. He is survived by a son of his first marriage and by his widow, Dorothy Kathleen Bell, secretary of the Society of Genealogists.

FREDERICK HENRY HEALEY

M.D., B.SC. BIRM., D.P.M.

Dr. F. H. Healey, who died at his home at Hellesdon, on Nov. 4 at the age of 48, had been superintendent of the Norwich Mental Hospital since 1938.

A Birmingham man, he obtained a first-class degree in medicine at Birmingham University in 1924, and the following year he began his mental-hospital career when he was appointed an assistant medical officer at Chester Mental Hospital. In 1927 he took his D.P.M., and in 1931 he became deputy superintendent of the Derby Borough Mental Hospital. The same year he was awarded with commendation his M.D. in psychological medicine for a thesis on syphilis in relation to psychosis. From 1933 to 1937 he had further experience in mental-defective and mental-hospital work in Essex, Birmingham, and Somerset, till he took up his Norwich appointment in 1938.

C. D. R., a member of his staff, writes: "Dr. Healey inspired us by his own untiring energy and unfailing response to those in need of help. He kept the hospital abreast of all modern advances in inpatient therapy, but it was in his efforts to extend the boundaries of psychiatric treatment beyond the gates of the mental hospital that he spent himself most devotedly. He extended the existing outpatient clinics, he founded new ones in the areas which the hospital serves, and he did much to establish the Norwich child-guidance clinic. He visited patients in their own homes, not only as a consultant but to continue with their treatment, and he saw many outpatients at the hospital and at his own home. He made it easy for patients to seek early and without apprehension the psychiatric help which they needed."

C. N. adds: "Dr. Healey was a man of tremendous energy. To keep in touch with his staff he would visit the hospital wards, often at seven in the morning, so that he might know the work done by the night as well as the day staff. In his office he worked at tremendous speed. He never wasted either time or words. A visit to his office was short, and, business over, the visitor would be launched from the room. But in spite of the speed at which he worked, his work was never hurried and was always thorough. He disliked what he considered to be unnecessary form-filling, but his certification forms were a model of what they should be. Though a good administrator his heart and soul was in clinical medicine. He believed in the treatment of the individual by the individual. Honest, truthful, and sincere, in dealing with matters which required tact and diplomacy honesty of purpose was his first principle. His early death will cause much sorrow. But on looking back at his life, though the 'acts of the drama' seem all too short, I cannot help but feel, that 'the drama was complete.'"

Dr. Healey married in 1926, and he leaves his widow with a daughter and two sons.

Appointments

Hospital for Sick Children, Great Ormond Street, London:

ARNOTT, D. O., M.B. Lond., D.C.H.: supernumerary registrar, department of physical medicine.
BRIMBLECOMBE, F. S. W., M.B. Lond., M.R.C.P.: house-physician.
JOLLY, H. R., M.A., M.B. Camb., M.R.C.P.: house-surgeon.
LAWSON, D. N., B.A., M.B. Camb., M.R.C.P.: resident asst. physician.
NASH, F. W., M.B. Lond., M.R.C.P.: supernumerary medical registrar.

City of Liverpool Maternity and Child-Welfare Department:

Asst. M.O.:
FRAZER, JEAN, M.B. Lpool.
MORGAN, LUCILLE, M.B. Lpool, D.C.H.

Lancashire County Health Service:

Divisional M.O.:
CARROLL, J. D., M.B. N.U.I., D.P.H., D.C.H.
CRIBB, G. T., M.B. Brist.
CURTIN, MARY, M.B. N.U.I., D.P.H., D.C.H.
ELWOOD, W. J., M.B. Belf., D.P.H.
FETTES, W. Y., M.B. Aberd, D.P.H.
RUTHERFORD, H. W., M.B. Aberd., D.P.H.

Notes and News

LONDON'S VOLUNTARY HOSPITALS

THE King's Fund has now published its last Annual Sta tical Summary,[1] completing an unbroken series since 1 These form the only official record of the work performed the voluntary hospitals of London, and their finances.

At the end of last year the total bed complement (incluc 2278 pay-beds) was 21,799, against 21,616 for 1946 (incr 183) and 19,510 for 1938 (increase 2289); the number of b open for patients was 17,893, against 17,371 for 1946 (incr 522) and 18,651 for 1938 (decrease 758); while the aver number of beds occupied daily was 14,667, against 13,76 1946 (increase 899) and 16,104 for 1938 (decrease 14 Outpatient attendances totalled 9,351,518, against 8,022 in 1946 (increase 429,503) and 10,343,408 in 1938 (decr 991,890). Total maintenance expenditure amounted £12,121,000, against £8,669,000 in 1946 (increase £3,452,0 and £4,946,000 in 1938 (increase £7,175,000), and the ex of total expenditure over total income was £2,113,0 compared with £1,336,000 in 1946 and £274,000 in 1938. average cost per occupied bed for all hospitals was compared with £490 in 1946 and £233 in 1938, and respective costs per outpatient attendance were 5s. 3s. 11d., and 2s.

NEWS OF THE R.A.M.C.

IN the *Army Medical Services Magazine* the R.A.M.C last has a journal written "by all ranks and for all ran The first issue contains news of the Corps the world c articles of general interest, some lively editorial arti and a supplement describing the recent jubilee. Ar illustrated and cheerfully written, this magazine sh help to bring together past and present members of Corps. It is to be published quarterly at first, an obtainable, price 4s. 6d. per annum, from Messrs. Ga Polden Ltd., Wellington Press, Aldershot, Hants. The e should be addressed at the R.A.M.C. Depot and Trai Establishment, Crookham, Hants.

M.O.H.

M'Gonigle, of Stockton-on-Tees, who died in 193 most widely remembered for his study of the vital stati of the residents of a slum area before and after their tra to a model council estate. Their death and morb rates, instead of going down in the new quarters, went because they were spending too much on rent and too li on food. The disturbance this caused at the time might have formed the nucleus of a film of action; but the Ce Office of Information have missed their chance in *One M Story*. Here the routine duties of an M.O.H.'s office suggested by laboured scenes of "human understandi through which a beatified and unlikely M'Gonigle move the Passing of the Third Floor Back: the live wire has successfully insulated in layers of glorified red-tape. is a pity, for the subject had great possibilities, the ph graphy is very good indeed, and there are some pleasant touches, among them the slight wry grimace of the far whose cow's milk is to be tested for streptococci. The has been made for the Foreign Office, presumably to s the world how an English M.O.H. thinks about his w Foreigners, however, will know better than to believe anyone thinks quite like that.

A MODIFIED PUNCH

Dr. L. Rendell Baker, senior assistant in the departm of anæsthetics of the Welsh National School of Medic has designed a time-saving punch for Copeland-Chatter

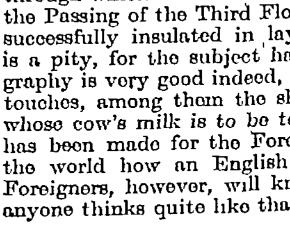

Fig. 1.

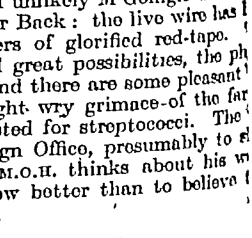

Fig. 2.

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[1] King Edward's Hospital Fund for London: Statistical Summ of the Income, Expenditure, Work, and Costs of 159 Lond Hospitals for 1947. From the Fund's offices, 10, Old Jew E.C.2. Pp. 79. 1s.

RCINOGENIC AND ANTICARCINOGENIC SUBSTANCES *

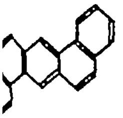
E. C. DODDS
M.V.O., M.D., D.Sc. Lond., F.R.C.P., F.R.I.C., F.R.S.
RTAULD PROFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF LONDON, AT THE MIDDLESEX HOSPITAL

HE production of cancer in man was long supposed e a very slow process. Almost a lifetime of irritation he scrotum by soot was thought necessary to produce chimney-sweep's squamous epithelioma; mule- ners' carcinoma was held to be due to long-continued osure of skin to clothing soaked in a carcinogenic oil; ers of the mouth were ascribed to the chronic ation of jagged teeth, pipe-stems, &c., and many r forms of carcinoma were attributed to general -specific chronic irritation over a long period.

ubsequent work, however, proved that there was ething extremely specific about the action of soot in lucing chimney-sweep's carcinoma. Yamagiwa and kawa (1915) showed that cancer could be produced abbits with tar, applied to their ears; Passey (1922) luced an epithelioma in a mouse by the application oot; and Cook et al. (1932) produced cancer in mice he application of certain pure chemical substances.

1921 Kennaway began to try to isolate the active inogen from tars. This work can be summarised in e stages. First there was the demonstration that inogenic substances could be formed from materials taining only carbon and hydrogen. Next a study of emission spectrum of such tars showed that the trum was of the same type as that of the polycyclic rocarbons. This led to the classical synthesis by k et al. (1932) of several polycyclic hydrocarbons and demonstration of their carcinogenic activity. Finally e the isolation by Hieger (1933), in Kennaway's n of a pure carcinogenic polycyclic hydrocarbon a tar.

e first synthetic compound shown to be carcinogenic 1 : 2 : 5 : 6-dibenzanthracene (fig. 1). Many polycyclic rocarbons were synthesised, chiefly derivatives of hracene, benzanthracene, benzpyrene, and cholanthrene . 2–5). Biological investigation revealed big differ- es in the quantitative activities of these compounds.



1—1 : 2 : 5 : 6-dibenzanthracene.

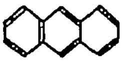


Fig. 2—Anthracene.

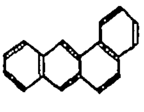


Fig. 3—1 : 2-benzanthracene.

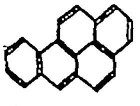


Fig. 4—3 : 4-benzpyrene.

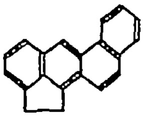


Fig. 5—Cholanthrene.

e very highly active compounds produced tumours almost 100% of treated animals, whereas the less ive compounds produced a lower percentage of nours. Again, the length of time necessary for the duction of a tumour varied with the molecular figuration, some compounds requiring only half the ne of others.

The experiments at the Cancer Hospital emphasised necessity of continuous painting of mice for a long ne, and the conclusion drawn from these experiments and from clinical observations of industrial cancer was that after several months in small animals, corresponding to decades in human beings, the agent or chemical causes a characteristic alteration in the cell which finally makes it malignant. Peyton Rous (1947) looks on the human body as being subjected to carcinogenic influences of various types, a summation of which over years produces cancer. I wish to call attention to objections to this theory of long-term action.

SHORT-ACTING CARCINOGENS ?

Cancer of the penis, like soot cancer and the cancer induced by painting the skin of mice, has been attributed to irritation over a long period. The source of this irritation is removed by circumcision, and it is well known that the condition never develops in circumcised Jews, who have almost all been circumcised in the second week of life. Kennaway (1947), however, has now shown that in Moslems, who are circumcised in early boyhood and never as babies, the incidence of carcinoma of the penis is the same as in the uncircumcised non-Jews. This suggests that the carcinogenic potentiality is conferred on the epithelium of the penis during the first few years, and that the carcinoma which develops forty or fifty years later had its foundation when the child was uncircumcised. The findings cannot be explained by removal of the cancer-bearing area, since the cancer often appears on the body of the penis rather than the foreskin itself.

These observations call for a new outlook on carcinogenesis. Is this phenomenon confined solely to carcinoma of the penis, or can we find evidence of it in other parts of the body ? We can learn a valuable lesson from industrial cancer. While the cancers appearing after a lifetime in the tar industry, or in cotton-spinning, seem to correspond to the effects of painting mice for a long time there are forms of industrial cancer which present a certain parallel to carcinoma of the penis.

In the manufacture of copper sulphate and in the refining of nickel the carbonyl process is used extensively in the British Empire and in this country. (The results obtained in Great Britain are considered here, because in this country the question is not complicated by radioactivity of the ores as in some of the Continental mines.) The workers in these industries have a high incidence of *cancer of the respiratory passages*, especially a particularly destructive form of carcinoma of the turbinate and ethmoid bones. Statistical analysis proves the causal relationship between exposure to the dust in these processes and the development of the cancer. The point that is significant to our argument, however, is that a man may be discharged from the works after two or three years' exposure and be pronounced physically fit after a most rigorous medical and otolaryngological examination; and yet in later years he may develop a carcinoma of the ethmoid terrifying in its destructive qualities (Amor 1938). Here then we have another example of a carcinogen acting over a limited period, causing some alteration in the cells which eventually, years afterwards, produces a malignant growth. Of the nature of the carcinogen in these cases little is known. Some workers have suggested that it is a combination of the carbonyl with certain metallic compounds; and others that arsenic in the dust is responsible.

Carcinoma of the bladder is a frequent accompaniment to work in the chemical section of the dye industry (Goldblatt 1947). The fact that workers handling the machinery of a dye-works are subject to constant attacks of hæmaturia has been known since the industry began. A proportion of these patients develop papilloma of the bladder, and some of these papillomas become malignant. The number of substances capable of causing these changes is very great, and they have often been reviewed. The most important and the most serious offenders are

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rom a lecture delivered at the 8th International Biochemical Congress held in Paris, October, 1948.

Kent Pædiatric Society

A meeting of the society will be held at Lingfield Epileptic Colony, Lingfield, Surrey, on Friday, Nov. 26, at 2.30 P.M. The meeting will include a visit to the special school attached to the colony.

An Old-fashioned Christmas

The Minister of Health has expressed the wish that the tradition of Christmas festivities for the patients and staff of hospitals should be continued in the new service, and hospital management committees and boards of governors have been authorised to spend up to 5*s*. per head of patients and resident staff from the Exchequer moneys at their disposal. This sum may be supplemented as the committee or board think fit from any endowment or free money available to them, and by any gifts made for the occasion.

Employment of Foreign and Colonial Doctors

Certain doctors with foreign qualifications wishing to work in Britain under the Medical Practitioners and Pharmacists Act, 1947, must be selected for a hospital post before being provisionally admitted to the Medical Register. A Ministry of Health circular requests regional hospital boards and hospital management committees "to give sympathetic consideration to the difficult position of these practitioners." The circular points out that there is considerable unemployment among Polish doctors, already on the register, who have been engaged in the Polish Resettlement Corps. "It is important that there should be no prejudice against the employment of such practitioners." The hope is also expressed that no discrimination will be exercised against coloured doctors seeking hospital appointments.

Retirement of Dr. Garfield Williams

The Very Reverend Garfield Williams, M.B., is next week retiring from the deanery of Manchester, on medical advice.

While at St. Bartholomew's Hospital he became interested in the Student Christian Movement, and later as its London secretary he visited Japan, China, and America. In 1910 he was appointed vice-principal, and superintendent of the science department, of St. John's College at Agra. Four years later he was ordained and became principal of St. Andrew's College, Gorakhpur. For work in the United Provinces during the 1914-18 war he was appointed O.B.E. In 1920 he returned to this country, and after teaching for a year at Rugby he was appointed foreign secretary of the Church Missionary Society in charge of education. Between 1924 and 1929, while secretary of the missionary council of the National Church Assembly, he was responsible for the five volumes of *World Call* reports describing the activities of the Anglican community overseas. In 1929 he became dean of Llandaff and two years later dean of Manchester.

Births, Marriages, and Deaths

BIRTHS

DANSIE.—On Nov. 1, the wife of Dr. E. R. Dansie—a son.

HADLEY.—On Nov. 16, in London, the wife of Dr. G. D. Hadley—a daughter.

JACKSON.—On Nov. 7, in London, the wife of Mr. Ian Jackson, F.R.C.S.—a son.

KENNARD.—On Nov. 8, in London, the wife of Dr. H. W. Harbrow Kennard—a son.

MANN.—On Nov. 10, in London, the wife of Dr. W. N. Mann—a son.

MARKOWE.—On Nov. 12, in London, the wife of Dr. Morris Markowe—a daughter.

MARRIAGES

ANDERSON—LEDGERWOOD.—On Nov. 13, in London, D. A. P. Anderson, M.B., to Myrtle Ledgerwood.

KAYE—WIGRAM.—On Nov. 6, at Shalbourne, Christopher Henry Kaye, B.M., to Kathleen Maude Wigram.

KER-GIBSON—BENHAM.—On Nov. 11, at Guildford, Arthur William Ker-Gibson, lieut.-colonel, R.A.M.C. retd, to Iris Benham.

NIEMYSKI-DONALD.—On Nov. 1, at Worthing, Anatol Niemyski, M.D., to Barbara Gertrude Rosemary Donald.

DEATHS

BLOMFIELD.—On Nov. 9, in London, Joseph Blomfield, O.B.E., M.D. Camb., F.F.A., aged 78.

DALYELL.—On Nov. 1, at Greenwich, Sydney, Elsie Jean Dalyell, O.B.E., M.B. Sydney.

FERRAR.—On Nov. 8, in Dublin, Benjamin Banks Ferrar, B.A., M.D. Dublin.

GILLESPIE.—On Nov. 9, at Barrowmore, Milnathort, David Gillespie, M.C., M.D. St. And.

GRIFFITHS.—On Nov. 3, at Cross Hands, Carmarthenshire, David Henry Griffiths, M.R.C.S.

HINDE.—On Nov. 8, Francis Richard Berthon Hinde, M.D. Edin., aged 84.

HUTCHINSON.—On Nov. 12, at Littlehampton, Robert Hilton Hutchinson, B.A. Camb., M.R.C.S.

West Kent Medico-Chirurgical Society

On Friday, Dec. 10, at 8 30 P.M., at the Miller Ho Greenwich, S.E.10, Sir Howard Florey, F.R.S., will de the Purvis oration. His subject is to be New Chemotherap Substances of Microbial Origin.

World Health Organisation

The executive board has approved the admittance o following international non-governmental organisations relationship with W.H.O.: International Union ag Venereal Diseases, International Union against Tubercu International Union against Cancer, World Federatio Mental Health, International Committee of the Red International Hospital Federation, International Acade Forensic and Social Medicine, International Leprosy As tion, and International Association for the Preventio Blindness.

CORRIGENDUM: *Period of Transmission in Epi Disease.*—In Dr. R. E. Hope Simpson's article of No the formula on page 759, column 2, line 10 should r $Y' \pm {}^1/_2(y+x)$.

Diary of the Week

NOV. 21 TO 27

Monday, 22nd

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. D. H. Brinton: Intracranial Aneurysm. (Part

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. F. K. Sanders: Results of Nerve Section.
5 P.M. Prof. J. H. Dible: Inflammation and Repair.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. F. Avery Jones, Mr. Hermon Taylor: Gastro

Tuesday, 23rd

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. J. A. Charles: Victorian Medical Administrator their Significance for Today. (Bradshaw lecture.)

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Cuthbert Dukes: Significance of the Unus the Pathology of Intestinal Tumours. (Imperial C Research Fund lecture.)
5 P.M. Prof. J. D. Boyd: Development of Urogenital Syst

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Mr. A. K. Monro: Abnormalities of the Cuta Circulation in the Lower Limb.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. Robert Platt: Renal

Wednesday, 24th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. D. W. Brooks: Pulmonary Tuberculosis. (Pa

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Boyd: Development of Cardiova System.
5 P.M. Prof. E. C. Dodds, F.R.S.: Sterol Metabolism.

MEDICO-LEGAL SOCIETY
8.15 P.M. (26, Portland Place, W.1.) Dr. F. E. Camps: Colch Taxi-cab Murder (1943).

HONYMAN GILLESPIE LECTURE
5 P.M. (Edinburgh Royal Infirmary.) Dr. Thomas Ander Pneumonia.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vin Street, Glasgow
5 P.M. Mr. A. Dickson Wright: Vascular Surgery. (John B lecture.)

Thursday, 25th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Professor Dodds: Sterol Metabolism.
5 P.M. Professor Dible: Inflammation and Repair.

INSTITUTE OF NEUROLOGY, Queen Square, W.C.1
5 P.M. Dr. W. Feldberg, F.R.S.: Acetylcholine and the Ce Nervous System.

Friday, 26th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. T. L. Hardy: Regional Ileitis.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. N. H. Martin: Applied Physiology of Parathyroid.

WESTMINSTER MEDICAL SCHOOL, Horseferry Road, S.W.1
5.30 P.M. Prof. Dugald Baird: Social Factors in Obstetrics

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. Franklin Wood: X-ray Kymography of Heart a Lungs.

EMPIRE RHEUMATISM COUNCIL
4.30 P.M. (Apothecaries' Hall, Black Friars' Lane, E.C.4.) W. S. C. Copeman: The Rheumatic Diseases. (Openin weekend course.)

ies of tumour-bearing animals was reduced to keep the ight of the controls equal to that of the treated animals, same *amount of inhibition of growth took place.* is crucial experiment was extended to other hydrobons, and it seems from Stamer's work that Haddow's ct is due to a dietary factor.

DISORDERED METABOLISM

Running all through the great numbers of studies on rinogenic and anticarcinogenic substances we conually come across the suggestion that malignancy may due to disordered metabolism, caused either by interence with the nutrition of the cell or by the poisoning some enzyme system. Haddow concluded from his k that malignancy may arise in the first place from bition of the activity of the cell, which in its turn duced some irreversible change. As we have seen, mer's experiments appear to show that this action be explained by the restriction in food intake of animals treated with the hydrocarbons. The same ibitory effect on the incidence of tumours in mice produced by Tannenbaum (1940a and b) simply restricting the animals' diet. This worker, from a carecrutiny of certain insurance-company statistics, cluded that overweight persons have an increased lity to cancer. It has also been shown that the tomas and cholangiomas produced by the azopounds can be hampered or prevented by various ry supplements, such as riboflavine (Miller et al. , Miner et al. 1943). On the other hand, pyridoxine s to encourage the development of these tumours. in supplements also appear to stimulate tumour uction (Du Vigneaud et al. 1942), and this effect can nulled with avidin. White (1944) has found that the ation of cystine and lysine in the diet of mice renders less liable to mammary tumours. *All these findings* t *that diet may play some part in malignancy.*

FOLIC ACID AND ITS ANTAGONISTS

t interest has developed in America during the years in the folic-acid group of substances, and ms that in this series are several having a definite nce on the malignant process. In a recent visit to ica I was able to discuss the problem with workers field. Those mainly concerned are at the Lederle atories and at the Sloan-Kettering Institute and Memorial Hospital, New York. The following is a brief account of a vast amount of work, and I am bted particularly to Dr. C. P. Rhoads, director of Sloan-Kettering Institute, for permission to give latest and in some cases unpublished results.

olic acid was recognised as an essential growth factor e time ago, and its constitution has been established its synthesis accomplished. It was early recognised folic acid played an important part in the diet of , and it was rapidly shown to have a profound ence on the bone-marrow. Folic acid causes a remission in pernicious anæmia but, unlike the liver factor, will neither prevent nor cure the subacute combined degenerative lesions in the spinal cord.

The molecule of folic acid enables several variants to be synthesised, and these have been examined for their folic-acid activity and for their effect on new growths in animals and in tissue culture. In some cases clinical trials have been made with them.

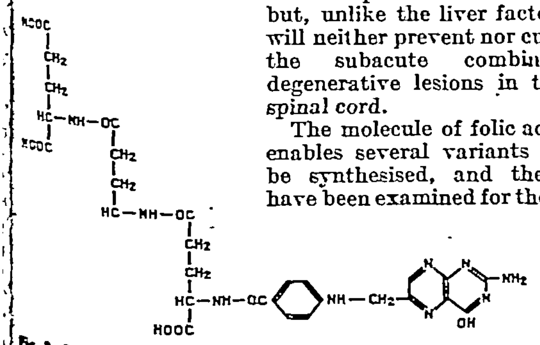

Fig. 8—Teropterin (Pteroyl-γ-glutamyl-γ-glutamyl glutamic acid).

Two substances producing an effect like that of folic acid on the tumours of animals were tried clinically. These were teropterin and diopterin (figs. 8 and 9). The more promising results have been obtained with teropterin. It has been claimed that this substance administered to patients with malignant disease stimulates their metabolism so that they appear to recover considerably in health. Gains in weight have been reported, and it has *been claimed that in some cases there has been a* noticeable effect on the tumour, as seen at biopsy. Opinions are divided in America about the effect of these substances. Several experienced workers claim that it is largely psychological and that, when a carefully controlled experiment is performed with controls, no difference can be detected between the controls and the *treated cases. I definitely gained the impression when in* the United States that the interest in teropterin had largely evaporated.

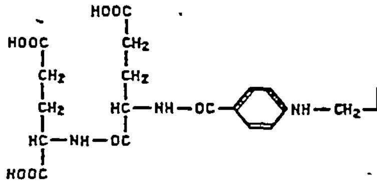

Fig. 9—Diopterin (Pteroyl-α-glutamyl glutamic acid).

Interest has now swung over to a group of compounds known as anti-folic-acid substances. The administration of some of the synthetic modifications of folic acid to animals had an inhibitory effect on the bone-marrow, with the result that profound anæmia was established. This effect could usually be reversed in most cases by the administration of folic acid, and the justifiable conclusion was that these new substances acted as inhibitors of folic acid. Precisely the same results were obtained with bacteria, and the stimulating effect of folic acid on their growth could be reversed by the addition of these anti-folic-acid substances. With some of these substances the effect was so profound that the animal died before the effect could be reversed by folic acid.

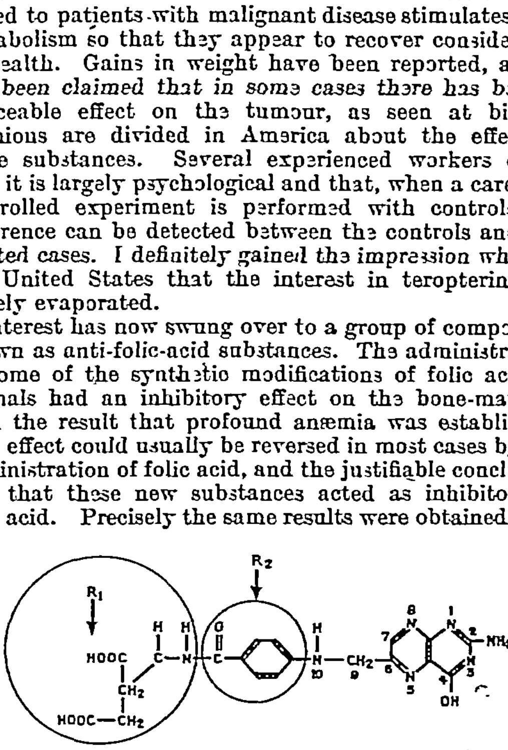

Fig. 10—Folic acid.

The American workers consider that the presence of folic acid is essential for the growth of cells. This can be shown by tissue-culture experiments; and, if anti-folic-acid compounds are added, the cell will die very rapidly. It is thought that only a few hours' deprivation of folic acid is needed to produce irreparable damage to the cell. The American workers suggest that by suitable anti-folic-acid treatment it may be possible to damage the malignant cells, which they feel are more sensitive to the action of anti-folic-acid compounds than are the normal cells.

The folic-acid formula is now numbered as in fig. 10. The following substances have been thoroughly investigated.

Aminopterin.—In this substance amino groups are introduced in the 2- and 4-positions. It is very toxic, but completely reverses the folic-acid effect both in bacteria and in animals.

β-naphthylamine and benzidine (figs. 6 and 7). Aniline, from which the cancer was originally called aniline workers' cancer, probably does not act as a carcinogen to the bladder: the actual carcinogen is probably one of the by-products associated with the manufacture and working up of aniline. Careful statistics, compiled not only in British works but also in America and in Germany, show that it is unnecessary to have a continuous exposure over many years, but that exposure for two or three years may be sufficient to lay the foundation of this malignant propensity which may manifest itself fifteen or twenty years later. There are definite and exact records of persons who have been taken out of the industry absolutely symptomless, and on cystoscopy have shown no abnormality, yet in later years have developed malignant papillomata.

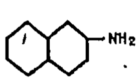

Fig. 6—β-naphthylamine.

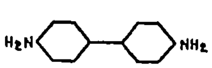

Fig. 7—Benzidine.

An entirely new and unexpected hazard has come to light in the use of *beryllium*, used in making electric-light bulbs and wireless valves. Until recently beryllium was regarded as entirely harmless, but several reports have now proved that the dust can give rise to a specific form of pneumonitis which is sometimes fatal. At necropsy the lungs show a neoplastic change precisely similar to that of sarcoidosis. Metastasis has not yet been described, but an osteogenic sarcoma has been produced in the rabbit with beryllium. Several workers have reported changes in the radiological and microscopical appearances of the lungs of persons exposed to the dust from beryllium compounds (Pascucci 1948, Van Ordstrand et al. 1945, Agate 1948). A report of a symposium at the Saranac Laboratory for the Study of Chest Diseases (*Journal of American Medical Association*, 1948) states that:

> "the unit lesion is a chronic granuloma composed of proliferative cells with widely scattered giant cells. . . . Spontaneous remissions and disappearance of roentgenologic shadows have not been noted. . . . Another characteristic is delayed onset, sometimes five years after the termination of exposure."

Research-workers have possibly been too obsessed with the production of carcinoma by polycyclic hydrocarbons, and it may well be that a study of some of these new compounds may shed fresh light on carcinogenesis.

ŒSTROGENS

So far we have only considered the production of cancer by agents external to the body. A vast number of experiments have also been made to see whether the body itself can produce them. For example, the possible carcinogenic effect of the female sex hormone has been studied.

The early stages of the œstrus cycle induced by œstrogens are characterised by proliferation and later keratinisation of epithelium, both processes closely resembling the early stages of cancer. If the naturally occurring œstrogenic hormones are painted for a long time on the skin of susceptible mice, no local tumour appears; so we are justified in concluding that œstrogens are not surface-acting carcinogens like the polycyclic hydrocarbons. Lacassagne (1932, 1936, 1938) has shown, however, that œstrogens can act as powerful carcinogens under certain conditions. He found that administration of œstrone to young mice increased the incidence of spontaneous mammary carcinoma in later life. This striking observation was rapidly confirmed, and there is now evidence that, if the strain of mice is one in which spontaneous mammary tumours do not occur, the treatment is without effect; but that in a strain with a definite incidence of mammary tumours œstrogen treatment causes a significant increase in that incidence. The same results are obtained with the synthetic œstrogens, which indicates that the causal factor is œstrogeni action, apart from molecular configuration. It must b pointed out in passing that, important as these result are from a theoretical point of view, they do not constitut a contra-indication to the clinical use of œstrogens, sinc the doses given to human beings are fractional compare with those administered by Lacassagne to mice.

ANTICARCINOGENIC SUBSTANCES

We are faced, therefore, with the fact that in man i is possible to change tissues to such an extent that the will later develop into carcinomas. Admittedly we d not know whether the change established during th first exposure is a continuous one that goes on until malignant change takes place, or whether this assumptio of malignancy is due to another factor or series of facto acting on the prepared ground.

The question arises whether it is possible by chemic treatment to make an organism insensitive to carcin gens. Extensive experiments have revealed only o method of protecting sensitive animals from the carcin genic action of polycyclic hydrocarbons on the ski and this immunity is only temporary. It is natural impossible to cite experiments on man, but one can gi a very definite example in the case of the mou Berenblum (1929), studying the effects of chronic irrit tion of the skin in experiments on animals, was partic larly interested in the effect of combining a chro irritant with a carcinogenic hydrocarbon. He chose dilu mustard gas (dichloro-diethyl-sulphide) as the chro irritant, and was amazed to find that, if the skin w treated with a dilute solution of this substance in aceto no amount of subsequent painting with carcinoge hydrocarbons appeared to have any effect. Lat however, he found this immunity to be only tempora (Berenblum 1931), and we can only conclude that in t treatment the skin was temporarily immunised by so chemical change. Though the vesicant action of musta gas is not understood, that it has some profound influen on the cells is shown by the fact that it can cause mutatio of the genes in drosophila (see below).

The study of supposedly anticarcinogenic substan does not help us very much, since the list includes such heterogeneous collection as cantharidine, carbon-dioxi snow, and heptaldehyde. Haddow (1935, 1938) an Haddow and Robinson (1937) suggested that certa carcinogenic hydrocarbons can reduce the rate of growt of animal tumours that they have induced. Briefl Haddow (1935) showed that the intraperitoneal injectio of certain carcinogenic hydrocarbons was followed b reduction of the rate of growth of transplanted Jens rat sarcomas, and that two non-carcinogenic polycycl hydrocarbons — anthracene and phenanthrene — wel inactive. Pybus and Miller (1937) showed that th administration of 1 : 2 : 5 : 6-dibenzanthracene to mic bearing spontaneous tumours had an *inhibitory* effect Haddow and Robinson (1937) extended their observation to tumours induced by carcinogenic hydrocarbons an showed that growth was inhibited.

The mechanism of this inhibitory effect has been muc studied, and the problem really reduces itself to whethe the inhibition is the result of a specific action on th growth originally produced by it or the result of a non specific action on the general health of the animal. Stame (1943) has shown that at least in the case of 9 : 10-dimethyl-1 : 2-benzanthracene the effect is not specific but is probably exerted on the general health of the animal. Thus animals treated with this substance do not eat well and lose weight. In an elaborate series of investigations Stamer showed that, if the diet of a control in a very large series of cases would have to be estigated. It is also claimed that in carcinoma of the ale genital tract dosage with testosterone propionate uces the incidence of secondary deposits ; but the me criticism applies. Again, claims have been made t primary growths of the breast have diminished der treatment. Some workers have used very large es and believe that they can arrest the development inoperable carcinoma of the breast.

Androgens have very serious drawbacks if large doses given for a long time, since masculinisation always pears—growth of hair on the face, deepening of the ke, and enlargement of the clitoris. It is difficult to how testosterone acts on the development of cancer. rhaps it acts by inhibiting the anterior lobe of the uitary gland, an action of testosterone which is well ognised, but it is very much less active in this respect n œstrogens.

NITROGEN MUSTARDS

The use of nitrogen mustards (fig. 14) in the treatment malignant disease originated in the discovery by erbach et al. (1942, 1943) that mustard gas and stances allied to it produced mutation of the genes drosophila. Clinical trials have been made with the chloro-ethyl-amines in the treatment of those forms of lignant disease associated with very rapid cell prolifera- n. These trials have been reviewed by Rhoads (1946). e most extensive trials were made in Hodgkin's ease. Relief of symptoms and regression of lymph- des lasting 4–8 months may usually be expected, if patient responds to the first course of treatment. A quent relapse will respond to a further course of ment, but after this the remissions are progressively er. Nitrogen mustards have also been used in hosarcoma, giant-follicle lymphoma, lymphatic emia, myeloblastic leukæmia, and a few miscellaneous . Rhoads (1946) sums up thus :

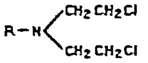

Fig. 14—Nitrogen mustards (β-chloro-ethyl amines).

> “Their use is limited by their toxic effect on the blood- ming organs, but on the other hand is probably justified n the treatment of any active extensive neoplastic process f other methods of control have proved to be without benefit.”

URETHANE

Urethane, like the nitrogen mustards, appears to act efly on the blood-forming organs, and this is the reason r its use in leukæmia. Paterson et al. (1947) have orted on the use of urethane in 38 cases of myeloid kæmia and 26 cases of lymphatic leukæmia. As with e nitrogen mustards, remission is in most cases only nporary, followed by relapses which may or may not pond to further treatment. Again, it is a matter for e clinician to weigh the undoubted risk of toxic ects against the substantial palliative effect which can obtained in otherwise hopeless cases.

NUCLEOTIDES

Investigation of the effects of nucleotides on tumour owth has been in the hands of Gulland and Parsons e Parsons and Barakan 1947). This work is only in its ancy, but appears to be well worth continuation.

CONCLUSION

The summary I have given must have a depressing ect. When one considers the vast amount of labour expended during the last fifty years to gain this meagre knowledge, one wonders how much more will have to be done before the cancer problem is solved. It is perhaps unwise to take this rather depressing view, since it does not necessarily follow that, if it has taken us fifty years to reach the present stage, in another fifty years we shall merely have doubled the amount of knowledge we have now. One has only to think of the centuries of observations made on the question of suppuration, with no progress whatsoever, and the rapid progress against that age-old enemy under the genius of Pasteur.

One very significant fact emerges from this study—that there are a great many ways of producing cancer, with no fundamental connexion between them, but that, having once started the process, we have no means of stopping or checking it by direct action. All the anticarcinogenic substances and agents act indirectly. Perhaps we shall not discover a directly anticarcinogenic substance until another Pasteur arises.

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It also inhibits œstrogens. Hertz (1948) has shown that aminopterin will inhibit the action of stilbœstrol on the chick oviduct. It must be admitted, however, that the dosage which produces inhibition is close to the toxic dose, and it seems that the specificity of this action is not yet proved. If a specific anti-œstrogenic action can be demonstrated for these compounds, a very important discovery will have been made. Aminopterin also has a slight but definite inhibitory action on the growth of spontaneous and transplanted tumours in animals. Farber et al. (1948) report that it caused definite remissions in 5 children with acute leukæmia, but there were also severe toxic reactions.

A-Methopterin.—In this compound there are amino groups in the 2- and 4-positions and a methyl group on the N_{10}. This substance is one-tenth as toxic as aminopterin and is said to possess all the properties of aminopterin—i.e., it is anti-folic-acid and anti-œstrogenic and it inhibits growth of tumours in laboratory animals and of malignant cells in tissue culture.

In view of the extremely promising results obtained in the laboratory with A-methopterin it has been subjected to clinical trial. Up to now nothing has been published about this, but Dr. Rhoads (private communication) informed me that promising results had been obtained.

'*Amino-AN-Fol*' has amino groups on the 2- and 4-positions and R_1 is aspartic acid.

'*AN-Fol-A*' has an amino group at the 2-position, a hydroxyl group at the 4-position, and R_1 is aspartic acid.

A sulphanilamide analogue of aminopterin has been made in which amino groups are at the 2- and 4-positions, R_2 is benzene sulphonic acid, and R_1 is glutamic acid.

This very brief summary of the American work can give no idea of the tremendous amount of energy expended. There can be no doubt of the great theoretical importance of this new group of substances, and the clinical results are awaited with interest. A complete bibliography of the recent American papers is included in the references.

COLEY'S FLUID

Until the last ten years no substance administered by any route to a patient with carcinoma affected the development of the tumour, except possibly Coley's fluid (see Nauts et al. 1946). Coley observed that patients with inoperable malignant disease were often better after an acute infection, such as erysipelas. He prepared cultures of various bacterial types, such as *Strep. viridans*, and claimed that by injecting the toxins of these organisms he could induce a regression of primary and secondary tumours, and that tumours susceptible to these toxins became hæmorrhagic and necrotic. Extensive clinical trial has shown that no uniform results can be obtained, and this treatment is probably not used anywhere today. There is sufficient testimony that results were obtained; but again we are faced with the fact that by making the patient thoroughly ill and cutting down his diet it is possible to limit the disease.

STILBŒSTROL

Since the time of John Hunter it has been known that castration sometimes reduces the size of the prostate, but only towards the end of last century was it realised that the only form of prostatic enlargement benefited by castration was that due to carcinoma. From then until 1940 castration as a treatment of carcinoma of the prostate varied in popularity, though there was no doubt of its efficacy in most cases. Huggins and Clark (1940) and Huggins and Hodges (1941), using acid serum-phosphatase to assess prostatic activity, showed that in the dog the activity of the prostate depended entirely on androgen secretion. In carcinoma of the prostate, particularly when associated with secondary deposits in bone, the amount of acid serum-phosphatase was greatly increased. Huggins et al. (1941) knew from his experiments on the dog that administration of androgens increased the acid serum-phosphatase, whereas removal of the testes or the administration of œstrogens diminishe the amount of acid serum-phosphatase. Huggins an his co-workers also knew that the administration large doses of œstrogen inhibited the anterior lobe the pituitary gland and abolished the secretion of th gonadotrophic hormone. By combining these observations they postulated that the administration of a powe ful œstrogen to patients with carcinoma of the prosta would lead to an improvement in their symptoms. Th naturally occurring œstrogens are only active by th parenteral route, and it was therefore impossible to these for the experiments. It is obvious that, if Huggin assumption was correct, it was essential to have a power orally active œstrogen.

Experiments were begun in the Courtauld Institute 1930 to investigate the specificity of the œstrus respon A very simple substance, 1-keto-1 : 2 : 3 : 4-tetrahydr phenanthrene (Cook et al. 1933) was found to have defin œstrogenic activity, though of a much lower degree th that of the naturally occurring œstrogens. By extendi these observations it was possible in 1938 to produce t stilbœstrol series of synthetic œstrogens (figs. 11–1

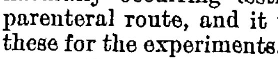

Fig. 11—Stilbœstrol.

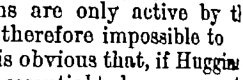

Fig. 12—Hexœstrol.

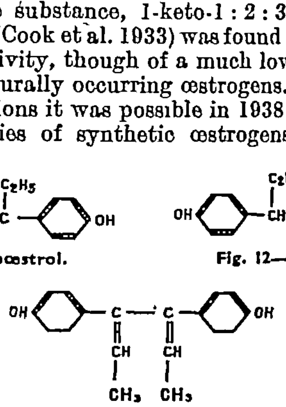

Fig. 13—Dienœstrol.

of which the most active is stilbœstrol (Dodds et al. 19 These substances have the great advantage of be active when given by mouth, and they were theref the ideal substances for use by Huggins to test hypothesis.

Huggins found that the administration of stilbœstr controlled the local and secondary growths of carcinom of the prostate, and this form of treatment has made possible for many patients to live for years with symptoms. There appears to be little doubt that t form of treatment is a kind of biochemical castrati through the action of stilbœstrol on the anterior lobe the pituitary gland. We can therefore say that the fi attempt at the chemotherapy of cancer which has be highly successful from the practical point of view really not a fundamental contribution to the canc problem at all, since its action is indirect and non-speci

ANDROGENS

Androgens have been used in the treatment of c cinoma of various sites in women on a purely empiric basis; the argument being that a male hormone mig possibly inhibit the growth of cells in the female bod Such an assumption is unwarrantable, and the id that androgens are entirely foreign to the female body no longer held. Examination of the urinary ketosteroi in normal women has shown a constant level of excretio of androgens. The androgen used is usually testostero propionate, administered by either subcutaneous intramuscular injection. Recently its administration sublingual pellets has been advocated. It is impossib to assess its value, since the conditions under which has been administered have been largely uncontrolle and unsuitable for statistical analysis. There exists, fo example, a series of papers on the use of testosterone propionate injections in women who have had a radica operation for carcinoma of the breast, and it is claime that the incidence of secondary deposits is lessene (Loeser 1948). It is obvious that to substantiate such

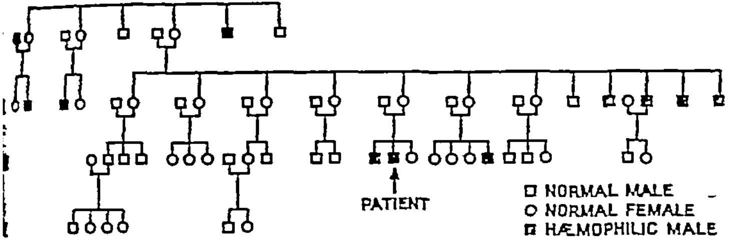

Fig. 1—The patient's pedigree, showing hæmophiliacs.

was removed on the 4th postoperative day, and his l condition returned to the preoperative level. He given bladder washouts and daily blood-transfusions of l. (see below).

ling of Wound.—A deep subcutaneous hæmatoma ped under the wound, and on Nov. 25. 10 days after the tion, a frank secondary hæmorrhage took place. When kin sutures were removed, the upper third of the wound d. The bleeding came from the depths and was arterial, the patient lost 100 ml. or more of blood before the bleed- was stopped with fibrin foam and packing. A large fusion (350 ml.) was at once given, and next day the lobin was 70%. The wound was closed over 'Oxygel' dised absorptive cellulose), but 2 days later the sutures to cut out, and on Dec. 1—*i.e.*, 16 days after operation— was another hæmorrhage from the wound. This was stopped with fibrin foam and packing. During the 5 days C.S.F. leaked from the wound. The leak stopped c. 7, and from then onwards the wound gradually healed n 10 weeks. *Staph. aureus* and on a few occasions *fæcalis* and *Proteus* were cultivated from the wound Nov. 28 onwards. The staphylococcus was relatively sitive to penicillin, 6–50 units per ml. being required to t its growth. Dressings were done with penicillin- amezathine' powder, and during the last fortnight nitrate was applied to the redundant granulations.

therapy.—Systemic penicillin, 15,000 units 3-hourly, en from Nov. 16 to Nov. 28, a total of 1·56 mega units. ezathine, mainly for the bladder infection, was n doses of 0·5 g. 8-hourly from Nov. 24 to Nov. 28, nd from Jan. 1 to Jan. 26, 1948, and sulphadiazine -hourly from Nov. 28 to Dec. 17.

er Function.—The patient was fitted with an indwell- eter from the outset, and daily bladder washouts were with boracic or potassium permanganate solutions for . By Nov. 24 the bladder was grossly infected and oli and *Proteus* were found in the urine for the next eks. After tidal drainage had been started on Nov. 30 ine became clearer; there were recurrences of up to cells per c.mm. (Dec. 10), but on Jan. 26, 1948, few cells were seen. On Dec. 9, 1947, reflex evacuation bladder was established and tidal drainage discontinued. sient superficial sacral bedsore was present during the d 6th weeks, but healed satisfactorily.

ral Condition and Paraplegia.—About a week after peration, withdrawal reflexes to painful stimuli were n both legs, more so on the right side. These became ally more vigorous. Slow voluntary movements began e right leg, at the end of the 3rd postoperative week, n the left leg about 2 weeks later. The power in both improved further, except for the muscles distal to the knee. From the 9th week the patient began to sit up, by the 10th week he could crawl but tended to fall to the side. The right leg seemed to have recovered com- y by the 10th week. Knee-jerks and ankle-jerks, ver, remained absent on both sides; the right plantar was extensor, and the left could not be elicited.

Progress.—After the secondary hæmorrhages and smaller rrhages from transfusion wounds the patient had several rises of temperature, but after the 7th week he remained rexial. From the 5th week he gradually became more ful and began to play with his toys and to make contented es. He was discharged on Jan. 30, 1948, in the 11th perative week. Myelography, with the contrast medium present in the spinal canal, showed globules of panto- scattered over the whole spine, with an arrest at lumbar vertebra (fig. 2*b*).

Follow-up Examination (March 10, 1948).—Two and a months after discharge the patient had begun to stand and walk with support. He still had a complete foot-drop and the calf muscles were wasted by $^3/_4$ in. on the left side, but movements of knee and hip were quite strong, and the right leg was normal. The right knee-jerk was now present, but the left knee-jerk and both ankle-jerks were absent. The plantar reflexes were flexor. He still had no proper control of his bladder, and the urine tended to dribble. Radiography of the spine showed the same arrest of the contrast medium at the 3rd lumbar vertebra. The scar on his back was sound and not more than 3 mm. wide.

TRANSFUSIONS

Two days before admission the patient had received a transfusion of 350 ml. of whole blood. During the 66 days from Nov. 15, 1947, to Jan. 19, 1948, he was given 62 transfusions of fresh blood to keep his condition as near normal as possible and to promote healing of the laminectomy wound. The transfusions were continued until the wound had completely healed. The usual quantity given was 50 ml. On four occasions he received larger quantities to compensate for blood-loss: during and immediately after the operation a pint was given by cannula into the left internal saphenous vein at the ankle; after the secondary hæmorrhage from the wound on Nov. 25 he received 3 5 ml., and next day 300 ml. by needle into the right external jugular vein; on Dec. 1 200 ml. was given by the same route after a further hæmorrhage.

The technique of transfusion was modified after the first postoperative week, during which the patient had been given five transfusions into the veins of the legs. It seemed clear that he was going to need a long series of daily transfusions, and it was decided to use venepuncture rather than to cut down on the veins. The right external jugular vein was selected as the most suitable. Up to 7 or 8 daily consecutive transfusions could be given by this route before the vein thrombosed, and it took 7–10 days for the vein to regain its patency. This vein was used on 21 occasions. When it was not usable, the transfusions were given by cutting down on the veins of the wrist or the dorsum of the hand and inserting a cannula. Unfortunately there was no vein adequate for venepuncture on the left side of the neck. It was found possible to use the same incision repeatedly (up to 6 times) by opening it up each day and inserting the cannula into the same vein. Initially the vein was tied off, but with increasing experience it was left patent and the same hole in the vein was used each time. A mild infection developed in these small wounds, but each healed cleanly within 4–7 days, except two from which there was a mild secondary hæmorrhage which delayed healing for a further week. A special drip apparatus with a capacity of 50 ml. was used for the

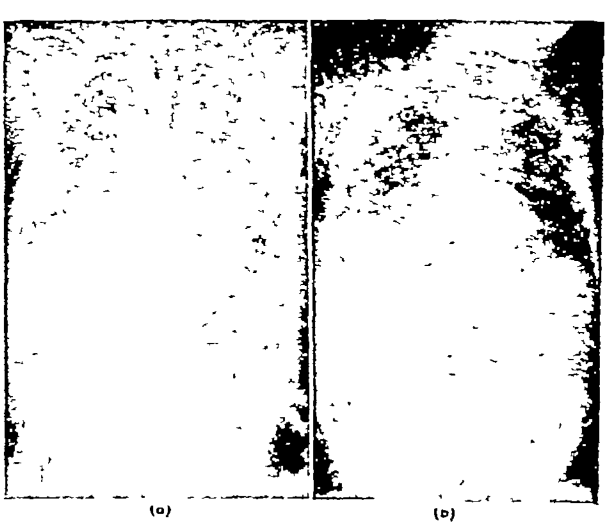

Fig. 2—Cisternal myelogram: (*a*) before operation, showing contrast medium arrested at T9; (*b*) after operation, showing contrast medium arrested at L3.

SURGERY IN HÆMOPHILIA

A CASE OF SPINAL SUBDURAL HÆMATOMA PRODUCING PARAPLEGIA

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THE following case is reported for three reasons—first, as an example showing that major surgery may be undertaken in hæmophilia without undue risk provided transfusions of fresh blood are given until all wounds are healed; secondly, as a case of spinal compression of unusual causation; and thirdly, as a rare complication of hæmophilia.

A boy, aged 16 months, was transferred to the Nuffield Department of Surgery on Nov. 15, 1947, on account of a flaccid paraplegia of six days' duration. He came of an undoubtedly hæmophilic family (fig. 1).

Previous History.—The patient was the youngest of three children; born a month prematurely, he weighed 5 lb. 3 oz. at birth, and was breast-fed for a month only. He gained weight satisfactorily. The first teeth erupted at 4 months. He sat up at 6–7 months, but did not begin to walk until 14 months—i.e., 2 months before his illness began. He apparently did not walk so well as his brother and sister; he had a peculiar way of throwing his head back and of walking on his toes, rather hurriedly, as though to offset by speed his uncertain balance. In his frequent falls he would bruise easily. He was lively, cheerful, and somewhat excitable, but could not talk except for making a few inarticulate baby noises. He had none of the infections of infancy.

Present History.—On Oct. 31, 1947, apparently without any preceding injury except for his usual falls, he awoke unusually late, at 10.15 A.M., seemed to remain drowsy and fell about more than usual. His legs, especially the right one, appeared to be weak. After his evening feed he vomited three times, and after the third vomit he fell unconscious and remained limp and pale, with eyes rolling from side to side, for about half an hour. His own doctor had him admitted to the Northampton General Hospital that night. On admission the child's temperature was 102°F, his neck was retracted, and he showed photophobia and redness of the tonsils and ear-drums. A throat swab yielded a scanty growth of hæmolytic streptococci. The cerebrospinal fluid (C.S.F.) contained 21 red cells per c.mm. A blood-count showed 4,100,000 red cells per c.mm. and Hb 80%. The bleeding-time was 2 min. and the clotting-time, as estimated by the capillary method of Dale and Laidlaw over 12 min. He was treated with sulphadiazine and made a satisfactory recovery within a week.

Arrangements for his discharge had been made when, on Nov. 8, neck-rigidity and pyrexia recurred. Next day he had complete paralysis of both legs and retention of urine. These signs persisted, though on the 10th slight movement could be elicited in the right vastus medialis muscle and in the right toes. Lumbar puncture was attempted on Nov. 9, 10, and 12, but failed. A cisternal puncture was performed on the 12th, and the C.S.F. contained protein 55 mg. per 100 ml. and 1813 cells per c.mm., mostly erythrocytes. Of the white cells 76% were neutrophils and 24% lymphocytes. Culture of the fluid was negative. On Nov, 13, the patient was given a blood-transfusion of 350 ml. of group-O blood (his own group). Two days later he was transferred to the Radcliff Infirmary.

On admission his temperature was 98°F, pulse-rate 13 and respiration-rate 28 per min. He looked fairly health but was fretful, with a little thrush in his mouth. Ther was head-retraction with stiffness of the neck and he had flaccid paraplegia with absent abdominal reflexes, knee jerks, and ankle-jerks. The right plantar reflex was extensor the left could not be elicited. On pinching there were a litt dorsiflexion of the right toes and ankle and a flicker in th adductor muscles of the right thigh but no spontaneous mov ments; there were no responses on the left side. No defini sensory level could be made out, but pricks even to the f seemed to distress the child. The upper limbs moved normal and their tendon-jerks were present and equal. The bladd was distended to 1 in. below the umbilicus; it was catheteri and slowly decompressed. The urine contained no album sugar, or acetone.

Two attempts at lumbar puncture failed, only clot in t needle and a drop of dark brown blood being obtained. cisternal puncture yielded moderately bloodstained C.S containing 1800 red cells and 8 white cells (3 polymorph 5 lymphocytes) per c.mm., protein 90 mg. per 100 ml., a chlorides 730 mg. per 100 ml. 'Pantopaque' 2 ml. w injected into the cisterna magna, and the subsequent myo gram showed a complete arrest, the pantopaque forming inverted U opposite the 8th and 9th thoracic verte (fig. 2*a*).

Diagnosis.—We were thus faced with the unusual emerg of acute spinal-cord compression of uncertain origin in hæmophilic infant. The legs had been paralysed for a w without any sign of recovery. Hæmatorrhachis was a poss diagnosis, but an inflammatory condition could not excluded. In our decision to explore the lesion laminectomy we were guided by the general considerat that decompression was the only possible treatment if child were ever to walk again, and it had to be risked in sp of the tendency to bleed.

Operation (Nov. 15, 1947).—*Laminectomy of the 7th to 12th thoracic and the 2nd lumbar laminæ. Removal of la solid subdural clot.*

The child was first given open 'Trilene' and then and oxygen through a mask. He was given $^{1}/_{3}$ pint of fre blood and remained in a favourable condition during operation, which lasted 2$^{1}/_{2}$ hours.

The final skin incision reached from the 7th thoracic to t 3rd lumbar spines. The lowest five thoracic and the seco lumbar laminæ were removed. The first lumbar lami was left intact. Wherever it was exposed the *dura* was bl and tight. When the dura was opened, clot bulged throu the incision, but it nowhere extruded spontaneously, bei too solid. The clot was difficult to remove with the suck especially over the conus, and forceps and pituitary ronge were necessary; it seemed that the clot was almost on t point of organising. In places it was up to 15 mm. thic It was a solid mass, mostly at the back of the cord but al surrounding it to some extent asymmetrically. Some w sucked away from the sides of the cord. The arachnoid w intact throughout, and pantopaque globules were visib underneath. The cord was orange-yellow and severe flattened below the lumbar enlargement but it assumed i normal shape after the clot had been removed. The the cord was pulsating and jugular compression made the fa globules of pantopaque move. A glimpse through a sma incision opposite the 2nd lumbar vertebra showed the roo of the cauda equina embedded in clot, which was too difficu to remove without damaging the roots.

The dura was left open over the cauda equina but wa closed over the cord with interrupted silk sutures abou 15 mm. apart. The muscles and lumbar dorsal fascia wer sutured with interrupted double silk and linen-thread stitches and a rubber drain was left at the bottom of the wound The skin was sutured in the usual way. There was n abnormal bleeding during the operation.

Immediate Postoperative Condition.—Apart from a rise in temperature to 102°F, in pulse-rate to 140–160 per min, and in respiration-rate up to 50 per min. for 2 days, the patient's immediate postoperative condition was promising. Th

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ough it was impossible in our case to remove that rt of the clot which surrounded the roots of the cauda pina, the finding and removal of a solid hæmatoma nstricting the spinal cord, followed by partial recovery, tified our decision to operate.

SUMMARY

Paraplegia due to a subdural spinal hæmatoma in emophiliac was partly cured by laminectomy.

Hæmatorrhachis is one of the rarest complications of mophilia and is usually fatal if not dealt with surgically.

The surgical risk in hæmophilia can be greatly minished by giving small daily blood-transfusions, tinued irrespective of the hæmatological findings l the wound has healed.

Pressure on a vital organ presents the greater danger he hæmophiliac.

e wish to thank Prof. Sir Hugh Cairns and Dr. R. G. farlane for their most valuable assistance and criticism.

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R INFECTION WITH DUST LIBERATED FROM CLOTHING

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RESPIRATORY infections may be spread by air carriage the causal organisms, by contact, by fomites, or by ect spraying with secretion droplets. That they are nly transmitted by air carriage is suggested by their y high incidence, clinical and subclinical, and the pidity of their epidemic spread (Wells and Wells 1936, ells et al. 1939), by their seasonal periodicity, which is parently due to domestic ventilation varying with tdoor temperature (Wells 1944), and by the success of r disinfection in reducing their incidence in schools and nvalescent homes (Wells et al. 1942, Harris and Stokes 45).

Pathogenic micro-organisms can enter the air in two ays: in droplet spray produced by speaking, coughing, r sneezing, and in dust liberated as a result of friction nd movement from the skin and clothing of infected rsons, from their bedding, or from the floor and rniture of their rooms.

As regards droplet spray, Wells (1934) has shown that he larger droplets fall out of the air within one or two econds, while the smaller droplets (under 0·1 mm. in ameter) evaporate immediately to form minute solid residues, "droplet nuclei," which may remain air-borne for several minutes or hours. It is well established that sneezing, coughing, and speaking contaminate the air with very large numbers of droplet nuclei containing salivary commensal organisms—e.g., 10,000–1,000,000 per sneeze, 10–1000 per cough, and 10–100 per hundred spoken words (Wells and Wells 1936, Bourdillon et al. 1942, Duguid 1945). However, the importance of droplet spray as a cause of air infection should not be overestimated, since it appears that pathogenic organisms are contained in only a small proportion of the droplets and in only a very small proportion, if any, of the droplet nuclei (Hare 1940, Hare and Mackenzie 1946, Duguid 1946a and b).

There is much convincing evidence to show that air is readily infected with dust-borne pathogenic organisms. Tubercle bacilli, pneumococci, hæmolytic streptococci, diphtheria bacilli, and pyogenic staphylococci have been found in the floor dust of rooms occupied by infected persons; and contamination of the air with hæmolytic streptococci and diphtheria bacilli has been demonstrated in relation to sweeping and other dust-raising activities (Cornet 1889, Avery et al. 1917, Stillman 1917, White 1936, Brown and Allison 1937, Thomas 1941, Cruickshank 1941, Crosbie and Wright 1941, Edward 1944, Hamburger et al. 1944, Green et al. 1945, Allison and Hobbs 1947). Dust-borne infection of air has been shown to result from disturbance of bedding (Thomas and van den Ende 1941), and from shaking of handkerchiefs (Dumbell et al. 1948). The skin and clothing of infected persons are a further important source of infected dust; hæmolytic streptococci have been demonstrated on the skin of the hands and face, on the handkerchiefs and on the inner and outer clothing of persons with upper respiratory-tract infection (Hare 1941, Hamburger and Green 1946, Colebrook and Ross 1947). Throat carriers contaminated the air with large numbers of hæmolytic streptococci derived from their clothing in an experiment designed to preclude air infection by droplet spray or by raising of dust from the floor and furniture (Green et al. 1945). Air has been contaminated with *Staph. aureus* by the shaking of pyjama jackets (Bourdillon and Colebrook 1946).

Wells et al. (1946) draw a sharp distinction between dust-borne air infection and droplet-nucleus air infection according to particle size and duration of air carriage; droplet nuclei are small, remain air-borne for long periods, are dispersed widely indoors, can penetrate to the lungs, and cause epidemic infections; infected dust particles are large, settle rapidly giving only localised and short-lived air contamination, and cause endemic infections of nose and throat. The validity of this distinction is not altogether certain. Air carriage for between half an hour and two hours has been demonstrated for a small proportion, 2–10%, of sneeze-produced droplet nuclei containing salivary commensal organisms (Bourdillon et al. 1942, Duguid 1946b). There is little comparable evidence about the duration of dust-borne bacterial contamination of the air, but this seems to be not very much shorter. In one experiment heavy air contamination with hæmolytic streptococci persisted for over 15 min. subsequent to its production by shaking clothes (Green et al. 1945).

In the present study measurements were made of the bacterial contamination of air produced by liberation of dust from the skin and personal clothing during bodily movement, of the duration of air carriage of the bacteria-carrying dust particles, and of the effectiveness of gowning as a means of preventing such contamination of air.

METHODS

The tests were made in a specially constructed test chamber of 100 c. ft. capacity (8 ft. high × $3^1/_2$ ft. × $3^1/_2$ ft.), which had a close-fitting door and was not small transfusions. Seven donors were used, some of them on 7 consecutive days.

What was probably a transfusion reaction developed on Dec. 5, when the patient's temperature rose to 103°F and he developed a macular rash an hour after a transfusion of 50 ml. The patient was well again within a few hours, and the same donor's blood was given next day without untoward effect.

Sedation for the transfusions into the jugular vein had to be heavy. Normally, chloral hydrate gr. 22 was given by mouth and paraldehyde 3 ml. intramuscularly, with the addition of paraldehyde directly into the drip during the three prolonged transfusions. For the transfusions by cannula only sufficient sedative was used to produce drowsiness and amnesia.

HÆMATOLOGICAL FINDINGS

On admission, 2 days after the transfusion of 350 ml. of blood the coagulation-time (Lee and White's method) was 9 min., the bleeding-time was 11 min., and the platelets numbered 270,000 per c.mm. (Lempert's method).

Two weeks after the operation the coagulation-time was 5 min.

Seven days after the last transfusion the coagulation-time was 23 min.; in Quick's test for hæmophilia citrated plasma recalcified after being spun for 5 min at 1000 r.p.m., clotted in 214 sec. (normal 90–125 sec.), and at 3000 r.p.m. clotted in 364 sec. (normal 105–145 sec.). Clot retraction was normal (42% serum expressed).

DISCUSSION

The fear of surgery in hæmophilia has been expressed, with few exceptions, in all published accounts of hæmophilia up to the present day. In the Babylonian version of the Talmud, originating in the second century A.D., it is ordained that a woman who has lost two sons from hæmorrhage after circumcision shall be exempt from the obligation of having a third son circumcised. Legg (1872) stated in his treatise: " In every case on record, where amputation has been done, or large artery tied, or any of the great operations of surgery performed, as, for example, lithotomy, the patient has died either from the bleeding caused by the operation itself, or of the bleeding for the relief of which the operation was undertaken." More than sixty years later Friedrich (1935) estimated the surgical risk in hæmophilia at 35%, and would not advise operation even with such strong indications as acute appendicitis, intestinal obstruction, cancer, or orthopædic deformities. In America Birch (1937) found that death in 22% of her cases of hæmophilia was due to surgery, and in Holland Kooreman and Hecht (1943) estimated this figure at 10%.

An analysis of the operations performed on hæmophiliacs is illuminating. In Birch's (1937) series of 25 deaths after surgery in hæmophilia the operations were circumcision in 15, tooth extraction in 6, tonsillectomy in 1, lancing of throat to relieve pressure symptoms in 1, lancing of hæmatoma of scalp in 1, and vaccination in 1. It is reasonable to believe that most of these lives might have been saved if blood-transfusion had been available. Seven other cases of fatal operations have been reported in some detail. Four of these were for gangrenous or perforated appendices, 1 a perinephric abscess, 1 a gastrectomy, and 1 a nephrectomy after which the patient developed a severe streptococcal septicæmia (Dahlgren 1908–09, Schloessmann 1912, Conrad 1925, Wossnessensky 1930, Custer and Krumbhaar 1935, Mertz and Meiks 1938, Vance 1939).

In contrast to this gloomy background is Weil's (1931) optimistic view, backed by a vast experience. He maintained that proper preoperative and postoperative treatment could change the hæmophiliac into an ordinary surgical risk, and it seems clear that death after such minor procedures as vaccination is unnecessary, since fresh blood can be run in through a vein faster than it can escape from a superficial scratch. The greatest danger in hæmophilia is pressure on some vital organ, as in our case.

Reports of 15 successful operations have been
These are of all degrees of magnitude, from oper
hæmatoma, correction of squint, amputation of
and plastic operation on the knee, to more maj
cedures like amputation of whole limbs, remo
gangrenous appendix, gastro-enterostomy, chole
tomy, splenectomy, prostatectomy, and even
tomy for carcinoma of the male breast (Lane 1
Feissly 1924, Weil 1931, Blalock 1932, Hinman
Jones and Tocantins 1934, Firor and Woodhall
Tavernier 1938, Sköld 1944). To this list may be
from our personal knowledge appendicectomy, s
tomy, amputation of leg, mastoidectomy, and
of tooth extractions.

Without discussing the prevalent views of the
of hæmophilia it may be said that the rational
ment at present is blood-transfusion. Local appli
have not proved effective, and the plasma fr
that may replace whole blood are not at every
disposal.

It is of historic interest that what was perha
first successful operation on a hæmophiliac was fo
by blood-transfusion. This was the correcti
squint carried out by Lane (1840–41). The
bled for days and was in extremis; a transfusi
given, and he sat up and drank a glass of wine.

The effect of blood-transfusion in hæmophili
only one or two days. To keep the patient as ne
normal state as possible before, during, and aft
operation, while the wound is healing (often an
protracted affair in these cases), the transfusions
be repeated at regular intervals. To be guided
clotting-time of the blood is unsafe, because it
invariably a true indication of the tendency to
Very occasionally after many transfusions the
may develop an anticoagulant (antibody), and
sequent transfusions are then ineffective (Lawrenc
Johnson 1942, Munro and Jones 1943, Craddoc
Lawrence 1947). An essential too often sadly neg
in the proper handling of every hæmophiliac
preservation of injectable veins.

Of the many forms of hæmorrhage that comp
hæmophilia, bleeding into the central nervous
is one of the rarest and most fatal. Aggeler and
(1944), in their comprehensive review, collecte
published cases, to which they added 1 of their
A few more have been traced. Lane (1840–41) ment
two members of a well-known hæmophilic family
died of cerebral hæmorrhage. Fonio (1936) desc
a case of left-sided hemiparesis with epilepsy foll
intracranial bleeding some years previously. Andr
(1943), in his survey of hæmophilia in Denmark,
some cases of intracranial hæmorrhage, but the ava
information was too scanty to determine their
character. He observed a case of hæmatom
following a fall from a chair, with paralysis and se
loss of the legs, incontinence of urine, and com
recovery in $3^1/_2$ months. Skold (1944), in a si
survey in Sweden, reported 5 hæmophiliacs with i
cranial hæmorrhage, of whom 3 died and 2 reco
in about a fortnight.

From a study of the published reports it is dif
to assess definitely the prognosis of spinal-cord com
sion by blood-clot. Either the reports do not
satisfactory evidence about the exact situation o
clot within the spinal canal (extramedullary or i
medullary, cord or cauda equina), or the degre
recovery is not unequivocally stated. It seems, how
that full spontaneous recovery has been observed
in cases of compression of the cauda equina (Bu
and Fildes 1912, Feissly and Curchod 1925). Death
been the most common sequel. The total of rele
cases reported does not exceed a dozen, and no atte
at treatment by laminectomy have been repor

occupant (fig. 1), and on whether or not a sterile gown was worn over the ordinary clothes (fig. 2).

Contamination of Air when Clothing was not Covered.—When a person with ordinary clothing entered the chamber quietly, stood motionless for 10 min., and then left quietly, the air contamination was increased only a little, an average of 9 bacteria-carrying particles per c. ft. of air being present during this occupation. With slight activity of the occupant greater air contamination was produced—an average of 129 bacteria-carrying particles per c. ft. Even greater air contamination was produced by vigorous activity—an average of 837 bacteria-carrying particles per ft; by undressing and dressing an average of 1672 eria-carrying particles per c. ft.; and by brushing es an average of 501 bacteria-carrying particles per c.ft. ause dust particles settle at different rates, it is sible to calculate from the numbers found per the exact total number put into the air during the m. activity period. However, a minimum may be ulated from the first observation made in the die-away od. This sample was not started until a minute er the occupant had left the chamber. It is assumed t by this time the dust particles had become uniformly persed throughout the entire 100 c. ft. of the chamber; persion was aided by the air disturbance caused when occupant opened and shut the door on leaving the amber. The number of infected dust particles per ft. found in the first sample of the die-away period as multiplied by 100 to give the total number in the amber at that time. This calculation showed that, on erage, at least 12,000 bacteria-carrying particles pable of remaining air-borne for more than a minute re liberated into the air during 10 min. of slight activity, d at least 67,000 such particles during 10 min. of gorous activity. If the standard slight activity of these periments is about equivalent to the average activity of ly life, the air must normally become contaminated om personal clothing at the rate of about 1,000,000 cteria-carrying dust particles per person per day.

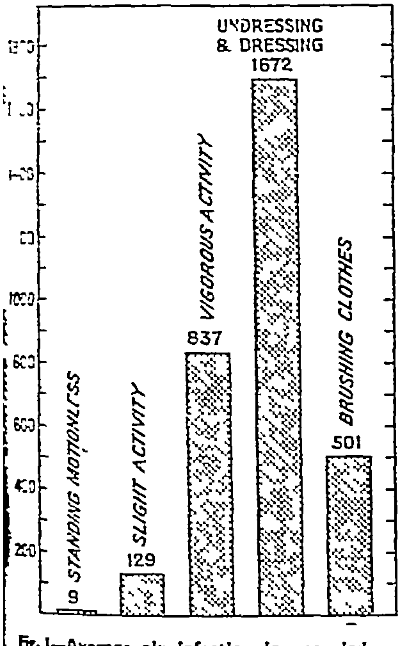

Fig. 1—Average air infection in occupied chamber.

Contamination of Air when Clothing was Covered with Sterile Gown.—Two methods of gowning were tested or their effectiveness in preventing contamination of the r with bacteria from the skin and clothing. The first designated "surgical gowning." A sterile surgical gown as worn over the ordinary clothing. This gown was of the usual type, made of light cotton cloth, long and loose, reaching to below the knees, tied at the back with tapes, loose and open beneath, and having sleeves reaching to the wrists. Sterile rubber gloves were worn with the gown cuffs tucked inside them. Disinfected long rubber boots were worn which covered the lower parts o the trouser legs. The usual surgical cap and mask wer worn. With this surgical gowning the average bacteria contamination of air by slight activity was 57%, and b vigorous activity 59%, of that found in the comparabl experiments without gowning. Such a reduction, b less than half, may be considered practically valueless This mode of gowning was insufficiently effective probabl because the dust particles from the skin and clothin were freely expelled through the gaps at the back of th gown where it was tied with tapes, and through the wid opening at the foot.

An attempt was made to design a complete dust-proo covering without any gaps through which dust-laden ai could escape from the clothing and friction-exposed area of skin. As a dust-proof gown we used a modified boile suit. This was a one-piece costume of heavy close woven cotton twill which covered the body, arms, an legs. The pocket slits were sewn up. A 'Zip' fastene was fitted instead of buttons to close the front. Elasti bands were put over the sleeve cuffs so that these gripped the wrists closely. A heavy canvas sock was sewn to the bottom of each trouser leg to form a complete covering for the foot and shoe. The collar was enlarged and made to tuck over and inside the collars of the jacket and shirt beneath. The ordinary clothing was thus completely covered without gaps at the feet, wrists, neck, or elsewhere for escape of dust-laden air. The suit was sterilised by autoclaving. In preliminary experiments the head was completely covered with a hood, and the hands were greased or gloved, but these additional precautions did not give increased protection and were not continued; not being exposed to friction the head and hands were not an important source of air infection. Bacterial contamination of the air was very much less in tests with dust-proof gowning than in tests without gowning or with surgical gowning. With dust-proof gowning the average bacterial contamination of air by slight activity was 12%, and by vigorous activity 4%, of that found in the comparable experiments without gowning.

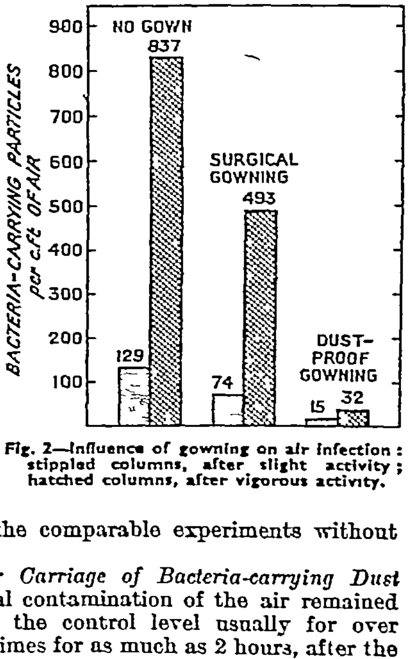

Fig. 2—Influence of gowning on air infection: stippled columns, after slight activity; hatched columns, after vigorous activity.

Duration of Air Carriage of Bacteria-carrying Dust Particles.—Bacterial contamination of the air remained appreciably above the control level usually for over 20 min., and sometimes for as much as 2 hours, after the termination of dust-raising activity. Fig. 3 shows the persistence of air infection following slight activity observed in a single experiment. For the experiments with a maximal recorded air infection of over 1000 bacteria-carrying particles per c. ft. the average time until disappearance of all but 10% of these particles was 35 min. Since much importance was attached to this considerable persistence of dust-borne bacterial contamination of the air, a possible but unlikely cause of error was carefully considered. Infected dust particles drawn into the air-sampler intake tube during the activity period might adhere to the walls of the tube and ventilated. The interior surfaces, walls and floor, were soaked with spindle oil to prevent liberation of dust from them. For bacteriological examination air was withdrawn by a short tube through the wall of the chamber to a slit sampler outside (Bourdillon et al. 1941); the entrance to the air intake was 3 ft. from the floor and was screened from above to prevent dust from falling directly into it. With a slit-plate distance of 2 mm. air was sampled at the rate of 1 c. ft. per min. on to plates of either ordinary blood-agar or heated blood-agar ("chocolate-agar") for easier recognition of greening by *Strep. viridans*. The plates were incubated aerobically at 37°C for 18–24 hours (longer incubation led to frequent spoiling of plates by "spreaders"). After the surface of the agar had been scored by parallel cuts with a scalpel, the colonies were counted with a binocular plate microscope (× 20); the microscope was required for sure recognition of the smaller colonies. In special tests with carriers a selective medium for *Staph. aureus* was used: an alkaline nutrient agar containing mannitol, lithium chloride, and 0·005% of tellurite (Ludlam 1948).

The principal experiments were made with four healthy men who were not carrying pathogenic bacteria. Bacterial contamination of the air was produced by one man entering the chamber quietly, closing the door, undertaking some standard form of activity while occupying the chamber for 10 min. (keeping his mouth closed to prevent the production of droplet spray), leaving the chamber, and closing the door. The standard activities tested were as follows:

(1) *Standing motionless*, avoiding so far as possible the slightest movement.

(2) *Slight activity*, standing fairly still for most of the ten minutes, but on four occasions making movements in a pretence at changing culture-plates in an imaginary slit sampler, bending the body, and reaching out the arms.

(3) *Vigorous activity*, "marking time" at walking pace continuously throughout the 10 min., raising the feet, and swinging the arms.

(4) *Undressing and dressing*, taking off all clothes a replacing them once during the 10 min.

(5) *Brushing clothes*, applying 40 strokes with a sterilis brush to the front of the jacket and trousers.

Each experiment was carried out as follows: In tl *control period*, before occupation of the chamber, tv 10 c. ft. air samples were taken. During the 10 mi *activity period*, while the chamber was occupied, fo 2 c. ft. samples were taken. Further samples were tak at intervals during the *die-away period*, the four hou after termination of activity and occupation of t chamber. During the occupation of the chamber, t temperature inside was usually 50–60°F, and the relati humidity 50–70%.

In these experiments nearly all the observed amou of bacterial contamination of the air must have b due to liberation of dust from the subject's skin a clothing, since raising of dust from walls and floor w prevented by the oil treatment, and droplet spray w avoided by the subject keeping his mouth closed.

RESULTS

The accompanying table shows in detail the resu obtained in 17 experiments with one of the non-carrie An exactly similar series of 17 experiments was ma with each of the other three non-carriers; the resu being similar to those in the table, are not given in det but figs. 1 and 2 show average air-contamination val for all four series of experiments taken together. Th averages were calculated from all the activity-per observations made in equivalent experiments with four subjects.

While the chamber was unoccupied there was lit infection of the air; the average of the control-per observations was 2 bacteria-carrying particles per c. of air. Bacterial contamination of the air was alwa increased on occupation of the chamber, the amou depending on the kind of activity undertaken by t

NUMBER OF BACTERIA-CARRYING PARTICLES PER C. FT. OF AIR IN A 100 C. FT. CHAMBER DURING VARIOUS ACTIVITI

Period (min.)	Standing motionless			Slight activity						Vigorous activity						Undressing and dressing	Brushing clothes
	No gown	Surgical gowning	Dust-proof gowning	No gown		Surgical gowning		Dust-proof gowning		No gown		Surgical gowning		Dust-proof gowning		No gown	No go
	BA	BA	BA	BA	CA	BA	CA	BA	CA	BA	CA	BA	CA	BA	CA	BA	BA
Control:																	
0–10	6	4	3	1	1	2	1	1	1	1	3	2	2	2	2	1	3
11–21	5	4	4	1	2	2	1	2	1	1	4	1	2	2	1	2	2
Activity:																	
22–24	13	13	15	74	167	74	60	18	12	528	1332	527	366	17	35	858	815
24⅔–26⅔	11	18	7	142	307	114	95	22	16	1215	1953	986	865	29	37	2814	815
27⅓–29⅓	9	10	5	223	368	207	118	24	25	1233	2002	1201	864	45	53	3340	765
30–32	12	9	5	240	387	201	139	25	26	1321	1083	1108	914	42	49	2485	1125
Die-away:																	
33–35	9	11	6	181	250	86	100	21	21	928	1139	850	675	33	43	1545	839
37–39	16	7	9	126	203	64	72	23	19	819	808	556	457	23	34	1623	468
42–44	13	10	11	112	135	53	38	22	17	450	686	354	516	17	28	1237	250
52–54	14	14	8	71	31	44	22	11	10	268	321	204	213	14	21	645	115
72–74	11	12	24	30	9	19	8	8	5	140	122	82	84	9	12	212	21
92–102	7	4	..	21	7	13	2	7	4	96	59	35	45	5	7	96	11
152–162	4	4	..	12	4	8	1	5	1	43	30	13	14	2	3	30	6
212–222	2	3	..	11	3	5	1	3	1	22	10	8	3	2	1	11	6
272–282	..	..	..	..	1	..	1	..	1	9	8	4	3	3	1	5	4
Experiment no.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*

BA, blood-agar; CA, chocolate-agar; .., no sample taken.

of this organism to drying. One experiment was made to demonstrate survival in the dried state. Large numbers of *Staph. aureus* remained alive for over a month when dried in nasal secretion on a handkerchief. A sterile handkerchief was infected by a single nose-blow from carrier X, was placed at once in a sterile jar with loose cap, and was kept in the dark at room temperature; dilution in sterile broth and making of plate counts showed that after a month the handkerchief still contained about 4,000,000 viable *Staph. aureus.*

DISCUSSION

Transmission of Respiratory Infections.—The present observations make it clear that very large numbers of bacteria-carrying dust particles are liberated into the air from the skin and clothing as a result of normal bodily activities, and that many of these particles may remain air-borne for over half an hour. It is suggested that dust particles from clothing are not inferior to sneeze-produced droplet nuclei in supplying the physical means for air-borne transmission of infection. In particular, bacteria-carrying dust particles do not appear to be much coarser and more rapidly sedimenting than bacteria-carrying droplet nuclei, as suggested by Wells et al. (1946). Our finding that 10% of the bacteria-carrying dust particles remained air-borne on average for about 5 min. is to be compared with the finding by Bourdillon et al. (1942) and Duguid (1946b) that sneeze-produced bacteria-carrying droplet nuclei remained air-borne to the extent of 2–10% for 30–120 min.

The relative importance of dust and droplet nuclei as vehicles of aerial infection can be decided finally only by comparative quantitative observations of the dissemination of pathogenic organisms on these different vehicles. Our present observations with two carriers of *Staph. aureus* showed that the air was infected more regularly and to a greater degree by the raising of dust from clothing than by sneezing; 124 dust particles carrying *Staph. aureus* were recovered from 150 c. ft. of air contaminated by vigorous bodily activity for 150 min., whereas only 16 droplet nuclei carrying *Staph. aureus* were recovered from 840 c. ft. of air contaminated by 42 sneezes.

Surgical Asepsis.—The pyogenic organisms most often infecting wounds—*Staph. aureus* and *Strep. pyogenes*—commonly originate from the respiratory tract of carriers. Dissemination of infection from the respiratory tract via clothing dust to the air constitutes a means whereby surgical aseptic technique may be breached; infected dust particles may settle from the air on the operation wound, the surgeon's hands, instruments, and dressings. *Staph. aureus* and *Strep. pyogenes* have been demonstrated in the air of operating-rooms by Hart (1938), Hart and Schiebel (1939), and MacDonald (1940). Hart attributed frequent unexplained infections in clean operation wounds to this aerial infection. Colebrook and Ross (1947) demonstrated infection of the air of a burn dressing-room with *Strep. pyogenes*, which was proved by typing to be derived from a small sore on the surgeon's elbow; apparently the gown worn was not effective in preventing the dissemination of infected dust from this site.

Our present findings show that a large amount of dust-borne bacterial contamination of the air may be caused by ordinary body movement, and that some of the infected dust particles may remain air-borne for a time more than sufficient to allow their drifting to the operating-table from all parts of the theatre and from rooms and corridors adjoining. The loose cotton gown usually worn by surgeons was unable to prevent bacterial contamination of the air from the skin and clothing. Air infection is likely to be produced if surgeons, nurses, anæsthetists, students, or other attendants enter the operating-theatre or its gallery while clad in their ordinary clothes covered only by a loose gown.

Precautions Necessary in Bacteriological Examination of Air.—When examining air for its total bacterial content, an observer should take precautions against himself infecting the air, lest the counts obtained should reflect mainly his own activities in manipulating the air sampler and not the natural air contamination of the place examined. The movements involved in operating an air sampler have been proved sufficient to produce heavy bacterial contamination of air, by the present observations for slight activity, a mimicry of operating the slit sampler. Hitherto, when taking air samples, we have tried to minimise such contamination by wearing a sterile surgical gown, cap, and mask; in view of our present findings we intend in future to use a sterile dust-proof gown.

SUMMARY

The number of bacteria-carrying dust particles liberated from a person's skin and clothing into the air of a small chamber as a result of various bodily activities has been measured by examining the air with a slit sampler.

Large numbers of bacteria-carrying dust particles were liberated by even slight activity—e.g., about 1000 per min. by a person making movements equivalent to changing culture plates in a slit sampler. Very large numbers were liberated by more vigorous activities—e.g., about 10,000 per min. by a person "marching." Some 10% of these bacteria-carrying dust particles remained air-borne for half-an hour.

Experiments with nasal carriers of *Staph. aureus* showed that the air was infected with this pathogenic organism more regularly and to a greater degree by the liberation of dust from clothing than by sneezing. *Staph. aureus* was present in about 0·1% of the bacteria-carrying dust particles which entered the air from the clothing of carriers.

Air contamination with dust-borne bacteria from clothing was reduced only a little—e.g., to about half—when a sterile loose cotton gown of the usual surgical pattern was worn over the ordinary clothing, but it was reduced very greatly—e.g. to a tenth or a twentieth—when a sterile dust-proof gown was worn.

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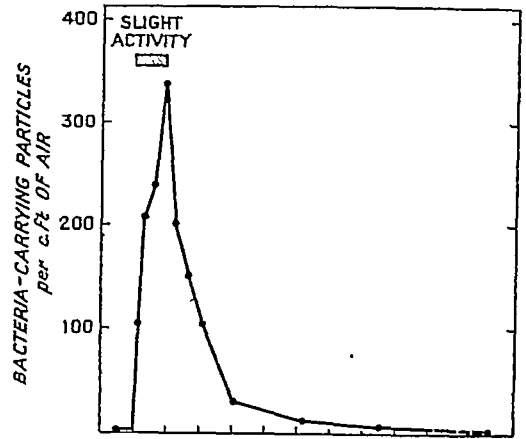

Fig. 3—Air infection produced by slight activity for 10 min.

then, during the taking of later samples, become freed, and pass into the sampler. To exclude this possibility experiments were made in which the air was heavily infected by vigorous activity and, to avoid contamination of the intake tube, no samples were taken during the activity period or during the die-away period until 30 min. after the person had left the chamber. The samples taken after this time showed amounts of air infection much above the control level (37, 38, 71, 33, and 86 bacteria-carrying particles per c. ft. in five experiments); this confirmed the long duration of air carriage of infected dust.

RESPIRATORY-TRACT BACTERIA

Since the subjects of the experiments described above were not carriers of pathogenic organisms, the bacteria recovered from the air were exclusively non-pathogenic—mainly saprophytes normally resident on the skin and clothing. Proof was desired that persons with respiratory infection would disseminate pathogenic organisms on a proportion of the dust particles from their clothing. The presence in air of *Strep. viridans* has been suggested as a reliable indicator of contamination from the upper respiratory tract (Gordon 1903, Wells and Wells 1936). Therefore, in experiments made with chocolate-agar plates, those described above, and also a few made with a fifth subject (carrier Y), the number of colonies resembling *Strep. viridans* was noted.

A few such colonies were found in almost every experiment with each of the five test subjects. On plates exposed in 35 experiments, which bore a total of 141,694 colonies, there were 424 colonies (0·30%) which resembled *Strep. viridans* and were surrounded by zones of greening. However, on microscopical examination of smears from blood-agar and nutrient-broth subcultures of 168 of these colonies, only 10 showed streptococcal morphology and chain formation. The remaining 158 (94%) were gram-positive cocci grouped in pairs, tetrads, and clusters, but not in chains. These apparently corresponded to the "putative streptococci" which Buchbinder et al. (1938) found comprising 60% of the green-producing streptococcus-like colonies obtained in sampling air, and which he regarded as probably streptococci derived from the respiratory tract but altered in morphology and other characteristics as a result of their aerial environment. However, the possibility must be considered that the "putative streptococci" are not true streptococci but micrococci which normally reside as saprophytes on the clothing. Thus, in the present experiments the extent of bacterial contamination of the air from the respiratory tract via clothing is indicated not by the 0 30% of air-borne bacteria which gave streptococcus-like colonies with greening but by the 0 018% which were proved microscopically to be chain-forming organisms.

Experiments with two nasal carriers of *Staph. aureus* gave a more convincing illustration of the extent to which pathogenic organisms may be disseminated from the respiratory tract via clothing dust to the air. Both carriers regularly yielded heavy growths of *Staph. aureus* from the anterior nares, and scanty growths of *Staph aureus* from the jacket front, the jacket sleeves, and the trouser legs; often a few *Staph. aureus* were obtained from the chin and the hands, but usually none from the skin of the arms, legs, and chest. In carrier X the secretions of the anterior part of the mouth usually contained *Staph. aureus* (in four of the tests counts were made showing 30, 40, 5000, and 200,000 *Staph. aureus* per ml. of secretion); whereas carrier Y did not yield *Staph. aureus* on culture of the secretions of the ant part of the mouth. Only organisms found to be coagulase-positive were recorded as *Staph. aureus*.

Experiments were made with the carrier dressed i his ordinary clothes undertaking vigorous activity fo 10 min. in the chamber; to prevent air infection b droplet spray the carrier refrained from speaking an wore a surgical mask over his mouth and nose. In ever one of fifteen experiments a few *Staph. aureus* we recovered from 10 c. ft. of the chamber air in samples take during the activity period and the next 10 min. I nine experiments with carrier X a total of 76 *Stap aureus* particles were found in 90 c. ft. of air; *Staph. aure* comprised about 0·12% of the total bacterial content the air thus infected with dust from clothing (the tot bacterial content was estimated from counts on chocolat agar plates exposed alternately with the plates of selecti medium used for counting the *Staph. aureus*). In si tests with carrier Y a total of 48 particles carrying *Stap aureus* were found in 60 c. ft. of air; the staphylococc comprised about 0 06% of the bacterial content of the ai

For comparison with this observed amount of dissemi nation of *Staph. aureus* from the respiratory tract vi clothing to the air, further experiments were performe with the same carriers to measure the dissemination *Staph. aureus* directly into the air in droplet nucl produced by sneezing. To prevent air infection with du from his clothing the carrier was dressed in the steril dust-proof gown and was instructed to avoid unnecessary movement while in the test chamber. In each experimen carrier X gave two sneezes induced by tickling the nasa mucosa with a small cotton-wool swab; carrier Y gav four vigorous simulated sneezes. The sneezes were give in quick succession, delivered from a standing positio and directed towards a wall of the chamber 3 ft. away To allow sedimentation of the large droplets, samplin was not begun until a minute after the last sneeze then two air samplers were put into operation simul taneously, the slit sampler to take 10 c. ft. in 10 min and a sieve plate sampler (modified from Du Buy and Crisp 1944) to take 46 c. ft. in 2 min. The air intake o the latter sampler was 1 ft. above the floor and wa screened to prevent droplets falling directly into it Thus, in each experiment 56 c. ft. of air (over half the air content of the chamber) was sampled within a few minutes after the sneezing. Nine such sneezing experi ments were made with carrier X; in eight of these the air did not contain any particles (droplet nuclei) carrying *Staph. aureus*; in one experiment 11 *Staph. aureus* particles were found in the 56 c. ft. of air. Six tests of sneezing were made with carrier Y; in four of these the air did not contain any particles carrying *Staph. aureus*, in one test a single *Staph. aureus* particle was found in the 56 c. ft., and in one test four *Staph. aureus* particles were found in the 56 c. ft. Air infection with sneeze droplet nuclei was thus considerably less than the air infection with clothing dust produced by the same carriers.

The frequent presence of viable *Staph. aureus* on the clothing of carriers is related to the considerable resistance olloidal-red *Test*.—This was compared with lagan's colloidal-gold reaction in 60 pathological . The results were identical except in 2 cases, where disagreement was so slight as to be without nificance.

DISCUSSION

he sera studied have been too few for conclusions be drawn about the relative discriminant value of the ohol-turbidity and thymol-turbidity tests or to decide extent to which the results of the two tests are related. Our purpose is to draw attention to the plicity of the alcohol-turbidity and colloidal-red tests to suggest that they may repay further investigation. alcohol-turbidity test has the limitation that over-t flocculation nearly always occurs, whereas Maclagan (7) has pointed out that additional information can derived from the thymol-turbidity test by observing flocculation which takes place only with certain when the tubes have been allowed to stand. In the e of the colloidal-red test, the results are somewhat re difficult to read than those obtained with the oidal-gold test, owing to the slightly turbid or lescent appearance of the reagent.

SUMMARY

test in which serum is diluted with 15% alcohol been compared with Maclagan's thymol-turbidity tion, and the results have been found to be very ilar.

rci's colloidal-red test gave results identical with se obtained with Maclagan's colloidal-gold reagent.

he reagents required for the alcohol-dilution and oidal-red tests are simpler to prepare than those uired for Maclagan's liver-function tests.

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ULTIPLE ABDOMINAL CATASTROPHES

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HE main interest in this case lies in the remarkable mber of abdominal catastrophes from which the ient recovered. It also illustrates one or two principles some methods of treating difficult lesions.

CASE-RECORD

man, aged 56, was admitted on Feb. 21, 1946, with three s' history of abdominal pain, associated with constipation, increasing distension. He had had no previous abdominal uble, but was an epileptic.

e was not very ill. The abdomen was much distended and panitic. There was no local tenderness, and no masses e felt. The rectum was empty. Intestinal obstruction to carcinoma of colon was diagnosed, and the patient taken to the operating-theatre, where the anæsthetist gested the diagnosis of volvulus.

irst *Operation*.—Under general anæsthesia, the abdomen opened through a right lower paramedian incision, and enormous volvulus of the sigmoid colon was delivered, twisted, and deflated by a rectal tube. Deflation was terially aided by attaching a sucker to the end of the rectal be. The tube was left in the rectum, and the abdomen s closed.

His postoperative course was extremely satisfactory, and patient did very well until Feb. 27, when his bowels were not open. Next day his abdomen began to distend again, and on March 1 it was obvious that the volvulus had recurred.

Second Operation.—Under general anæsthesia a large oblique muscle-cutting incision was made in the left iliac fossa. The distended twisted loop was delivered through this, untwisted, and emptied. A double-barrelled colostomy was made, and the redundant loop was excised.

The patient did well for about five days, when he began to vomit. He was put on intravenous salines and gastric suction, and improved after a day. On March 12 he began to vomit and to be distended. He was again put on suction and salines but did not improve, and after 36 hours it was fairly obvious that he had a small-bowel obstruction.

Third Operation.—On March 14, under general anæsthesia, the abdomen was opened through a left lower paramedian incision. Two loops of ileum were found adherent and obstructed near the colostomy. Separation of these relieved the obstruction, and the abdomen was closed. The patient was kept on gastric suction and intravenous saline.

On March 16 the patient was gravely ill with a gross paralytic ileus and an extremely distended abdomen. Treatment by suction, saline, and morphine was maintained, and he slowly recovered from this, with a period of diarrhœa from the colostomy. On the 28th he was much better, and the colostomy was functioning normally. On the 30th his colostomy did not act. He began to vomit once more, and his abdomen rapidly became distended. He was again put on intravenous saline and gastric suction. Later that day he had not improved, and he had all the physical signs of a small-bowel obstruction.

Fourth Operation.—Under general anæsthesia, the right paramedian incision was reopened. A large mass of grossly adherent gut was found near the previous incision, which appeared to have ruptured subcutaneously. It was too adherent to allow separation of the gut, and an anastomosis was made of a distended to a collapsed loop above and below this area.

After this he progressed uneventfully until April 5, when left abdominal wound ruptured and gut was found in the dressing.

Fifth Operation.—Under general anæsthesia, the gut was returned to the peritoneal cavity. The rupture into the peritoneal cavity had taken place in the upper part of the wound. In the lower part, the skin had separated, but the skin edges were firmly adherent to loops of bowel, which formed the base of the wound. The opening in the peritoneal cavity was closed with through-and-through sutures. It was impossible to close the skin; so a large 'Vaseline' pack was placed in the wound and retained with stout silk sutures. Patient continued to do extremely well. He was given several blood-transfusions, put on a high-protein diet, and began to regain weight.

Sixth Operation.—At the end of April, the colostomy spur was crushed; and on May 3, after a preliminary course of succinyl sulphathiazole, the colostomy was closed.

At this time the patient's abdomen presented a healed right lower paramedian scar; a large elliptical wound on the left side, the floor of which was formed by adherent coils of gut; and the closed colostomy incision (fig. 1). Two days after the operation his bowels opened normally, and plans were made to skin-graft the uncovered coils of gut; but on May 8 a fistula developed in one of the exposed coils. The opening was about $^1/_4$ in. in diameter, and through it poured out small-gut contents copiously. It was dressed for two days with aluminium hydroxide and closed with a thread mattress suture. This appeared satisfactory for two days, when another fistula appeared 1 in. above the first. It was then decided to use a dressing which would both absorb the succus entericus and provide material for the ferments to digest thus using them up and preventing digestion of the skin and abdominal wall. The wound was dressed with a generous mound of dried milk, and this was changed as soon as it had become partially digested, usually in about $1^1/_2$–2 hours. Under this régime, the wound began to epithelialise

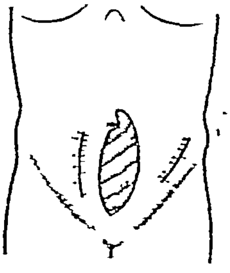

Fig. 1—Anterior of abdomen showing operation scars and wound through which coils of small gut are visible.

RESISTANCE TO PROGUANIL (PALUDRINE) IN A MAMMALIAN MALARIA PARASITE

(PLASMODIUM CYNOMOLGI)

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DRUG resistance is a recurring problem in chemotherapy. It had been of great importance in dealing with the sulphonamides, tryparsamide, &c., but has been conspicuous by its absence in the case of most antimalarials. Quinine-resistant strains of malaria have never been reported; resistance to mepacrine ('Atebrin') is almost unknown. The widespread introduction of proguanil ('Paludrine') in the treatment of malaria raised the question of the possible development of resistance by malaria parasites to this drug. Bishop and Birkett[1] and Williamson et al.,[2] working independently, showed that malaria parasites in chicks (*P. gallinaceum*) could be made highly resistant to paludrine but not to other antimalarials (with the possible exception of pamaquin). The resistance was not diminished by passage through mosquitoes. This provisional report records an attempt to induce resistance to paludrine in *P. cynomolgi*, a malaria parasite of monkeys closely similar to *P. vivax* of man.

EXPERIMENTS

The experiment was started in June, 1947, with a baboon (98) heavily infected by means of sporozoites. When the infection developed, small doses of paludrine were injected intramuscularly. The doses were designed to reduce the number of parasites in the blood without abolishing them altogether, but there were often long negative periods owing to overdosage, to immunity reactions by the host, and to the spontaneous remissions in the course of the parasitæmia which are common in infections of *P. cynomolgi*. The action of paludrine is exerted slowly and it is usually necessary to wait two days to discover the effect of any given dose. The original baboon (98) is still under experiment, though it relapses only at six-weekly intervals. Two other baboons and one rhesus monkey have been subinoculated from it and treated in the same way.

No precise determination of the initial sensitivity of the strain was made, owing to scarcity of monkeys at the time; but two daily doses of 0·03 mg. per kg. made the blood free from parasites, and three doses of 0·01 mg. per kg. on alternate days slowly suppressed an attack of malaria. L. H. Schmidt (personal communication), in a detailed investigation of the sensitivity to paludrine of the same strain of *P. cynomolgi* in over 100 infections, has found that daily doses of 0·075 mg. per kg. for seven days will always abolish the blood parasitæmia; and that daily doses of 1·25 mg. per kg. for seven days will permanently cure 100% of trophozoite-induced infections.

After fourteen months of treatment with subeffective doses of paludrine, doses of 25–30 mg. per kg. have failed to abolish the blood parasitæmia in all 4 treated monkeys. This dosage is approaching the maximum tolerated level, which is about 40 mg. per kg. daily. Thus the resistance seems to have increased about 1000 times (in round figures from 0·03 mg. to 30 mg. per kg.). This investigation is being continued. Schmidt (loc. cit.), working on similar lines, has succeeded in obtaining a strain of *P. cynomolgi* completely resistant to the maximum tolerated dose of paludrine.

SUMMARY

A strain of monkey malaria (*P. cynomolgi*) has been subjected to repeated subeffective treatment with paludrine. After fourteen months its resistance to paludrine has increased about 1000 times, so that doses approaching the maximum tolerated one are only partially effective.

In view of the close similarity between *P. cynomolgi* and *P. vivax*, it seems probable that benign tertian malaria in man might become resistant to paludrine though this process would probably take a long time t complete even under favourable conditions.

We are indebted to Mr. E. C. England and Mr. D. Garlic for technical assistance.

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SIMPLIFIED FLOCCULATION TESTS FOR DIFFERENTIAL DIAGNOSIS OF JAU

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IT has been suggested by Dreyfuss (1948) that th turbidity obtained on mixing certain pathological ser with a solution of thymol in barbitone buffer (Maclaga 1944a) may partly be due to the dilution of the seru in a hypotonic solution. He has described a test, usi simple dilution of serum with water, which gives resul closely correlated with those of the thymol-turbidit test. Wiseman (1934) described a test for malaria i which serum was flocculated by addition to water, an about two years ago Dr. A. A. Miller drew our attentio to a dilution test, using 15% alcohol as diluent, whic was introduced by Naidu et al. (1942) as a diagnost test for malaria. We have since used a modification this test in parallel with some other "liver-function tests (Mawson 1948) for the differentiation of obstructiv jaundice from infective hepatitis, and have also applie it to sera from patients with cirrhosis of the liver. W have at the same time compared results obtained with th colloidal-red test (Ducci 1947) with those obtained wi the colloidal-gold reaction (Maclagan 1944b).

Alcohol-turbidity Test.—To 7·5 ml. of 15% ethyl alcohol distilled water add 0·3 ml. of serum. Invert gently twice leave for 30 min. at room temperature. The turbidity is re in a King (1942) photo-electric colorimeter with an Ilfor spectrum orange filter, with 15% alcohol in the control tub One unit of turbidity is defined as the turbidity produced b a dilution of normal serum in 0·85% sodium chloride, con taining 10 mg. of protein per 100 ml., when 2 ml. of th serum dilution is mixed with 6 ml. of 3% sulphosalicyl acid (Mawson 1942). This is equal to the unit used by Maclaga (1944a) for the thymol-turbidity test.

Colloidal-red Test.—This was carried out as described b Ducci (1947) except that the solution of colloidal Sudan r was made to 80 ml. instead of 800 ml.

RESULTS

Alcohol-turbidity Test.—With the sera of 165 appar ently normal blood donors the mean alcohol turbidity was 1·2 units. The standard deviation was 0·72, giving a normal range (mean ±2 × S.D.) of 0–2·6 units. In 13 cases of obstructive jaundice there was a mean alcohol turbidity of 1·9 units (S.D. 1·2), and 8 cases of infective hepatitis gave a mean of 7·8 units (S.D. 3·6). The differ ence between the means is significant, being 4·4 times the standard error. All cases of infective hepatitis gave alcohol turbidities above normal (range 3·8–15·5 units). The range in obstructive jaundice was 0·2–4·4 units. Of the 13 sera 4 gave results which were above normal (2·8, 2·8, 3·6, and 4·4 units). From patients with hepatic cirrhosis 5 sera have been tested, giving results of 5·8, 6·2, 6·5, 8·0, and 11·0 units.

fore being boiled. Cotton-wool may contain some ducing substances; so it should be tested before being ed for making swabs. If the swabs are not subjected the reaction immediately after collection, destruction the reducing substances by bacterial action may have be prevented by suitable precautions.

RESULTS

Ovulatory Phase.—Of 43 specimens collected from women believed to be fecund during the presumptive ulatory phase of the menstrual cycle, 32 gave a itive reaction, 3 a weakly positive reaction, and 8 negative reaction. Of 6 similar specimens obtained ring postcoital tests and heavily invaded by sper-atozoa showing a high survival-rate, 5 also gave posi-re reactions. Two extremely densely invaded specimens wing a low survival-rate (isolated oscillatory sper-atozoa only) gave a negative reaction, as if the free ducing substances had been exhausted by the invaders had been deficient. The semen in these cases gave ositive invasion test with good survival.

Luteal Phase.—Of 23 specimens collected from 16 omen during the luteal phase of the cycle, two to ven days after the thermal shift from the low to the h waking temperature, 16 gave a negative reaction, gave positive reactions of various degrees, and 2 were ubtful.

Early Pregnancy.—Of 18 specimens collected from women during early pregnancy—i.e., before the end the eighth week, 13 gave a negative reaction, 4 gave itive reactions of various degrees, and 1 was doubtful.

Secondary Amenorrhœa.—In 2 cases of secondary enorrhœa with presumptive œstrogen deficiency the ces of mucus obtained gave a negative reaction. er injection of œstrone (1·5 mg. microcrystalline pension) an appreciable quantity of mucus was eted and a positive reaction obtained. Combined ction of œstrone crystals 1·5 mg. and progesterone als 3·5 mg. evoked secretion of mucus which gave ative reaction. Conversely, in 2 cases of secondary orrhœa with presumptive high level of œstrogenic tion (profuse clear cervical secretion; pronounced iferation and cornification of the vaginal epithelium, deposition of glycogen) the mucus gave a strongly tive reaction.

Endocervicitis.—The test was carried out in several es of endocervicitis with purulent secretion during ovulatory phase. The reaction was positive during phase.

CONCLUSIONS

The results are compatible with the following tentative onclusions:

(1) The cervical glands tend to react to œstrogenic cretion with the production of mucus rich in free ducing substances, but these are not demonstrable in specimens, even though the mucus may show the ypical ovulatory appearance.

(2) If, however, the œstrogenic secretion is combined ith progesterone (as in early pregnancy), the production reducing substances tends to be inhibited.

(3) The inhibition probably depends on the relative mounts of œstrogen and progesterone secreted. These end to vary during the luteal phase and in early regnancy. During these phases dominance of œstro-ens producing temporary falls in the waking tempera-ure and passing "clarification" of the cervical mucus as been observed.[5] These variations (œstrogen surges) may explain the appearance of reducing substances in ome specimens taken during the luteal phase or during regnancy. It is also possible that in some cases mucus may be secreted in such quantities and of such a nature that conjugated reducing substances are liberated during heating of the swab. This possibility is being investigated.

The reaction may be of assistance in the understanding of endocrine conditions prevailing at any given time and in the examination of cervical mucus during postcoital or invasion tests, since survival of human spermatozoa appears to be associated with availability of reducing substances. The possible clinical application of the test is being investigated jointly with Dr. Mary Barton, to whom we are much indebted for the supply of specimens of cervical mucus.

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Reviews of Books

Modern Methods of Infant Management

Before, During, and After Birth. Editor: W. R. F. COLLIS, M.D., F.R.C.P., pædiatrician, Rotunda Hospital. London: Heinemann Medical Books. 1948. Pp. 285. 17*s.* 6*d.*

DESPITE its small size, this is a remarkably comprehensive little book, in which two pædiatricians (Dr. Collis and Dr. P. C. D. MacClancy) have joined forces with Dr. Ninian Falkiner, an ex-master of the Rotunda, and Miss M. Moran, the sister in charge of the infants' department. It deals with antenatal care and the conduct of labour, the management of the newborn baby, problems of infant feeding, and a variety of abnormal conditions encountered in the neonatal period. The editor says in his preface: "No sentiment of any kind enters the question as to whether it [the infant] is going to thrive or fail, live or die. The rules are exact and clear and, if followed, one may reasonably expect a healthy thriving baby, if neglected disease and death." This may be a surprise to some of us who were inclined to wonder why so many mothers who placidly follow their instinctual way raise healthy children while others who conscientiously follow the "rules" are sometimes less successful. But it is certainly true that neonatal mortality can and should be reduced by better instruction of the doctor and midwife in the care of the newborn. In many ways Dr. Collis's book is well suited to the purpose, being well illustrated, and mostly non-controversial. Sometimes, however, the facts are oversimplified to the point of being misleading. Of pneumonia acquired at birth, or within the first week of life, one of the authors remarks: "The symptoms resemble those of pneumonia at other age periods: rapid respiration, high temperature, moist sounds in the chest with variable signs of consolidation. It is not a difficult diagnosis to make, though the examination of the infant's chest is a science in itself which the inexperienced can only acquire from practice." It would be interesting to know what proportion of pneumonias in the first week of life are in fact correctly diagnosed on the criteria given.

The Salicylates

A Critical Bibliographic Review. MARTIN GROSS, M.D., assistant professor, laboratory of applied physiology, Yale University; LEON A. GREENBERG, PH.D., associate professor at the university. New Haven: Hillhouse Press. 1948. Pp. 380. $6.

THIS is an exhaustive review of published work on the salicylates. If there is little new in the conclusions about the analgesic and antipyretic effects of these drugs it is nevertheless valuable to have the whole subject reviewed. The effects on the gastro-intestinal system are difficult to assess: large doses undoubtedly induce prothrombinopenia. Writing of rheumatic fever, the authors say that "suppression of the inflammatory process and prevention of undesirable sequelæ are best effected by a quickly established concentration of salicylate in the plasma." Coburn showed that a salicylate concentration of at least 35 mg. per 100 ml. of plasma was necessary to produce constant progressive subsidence

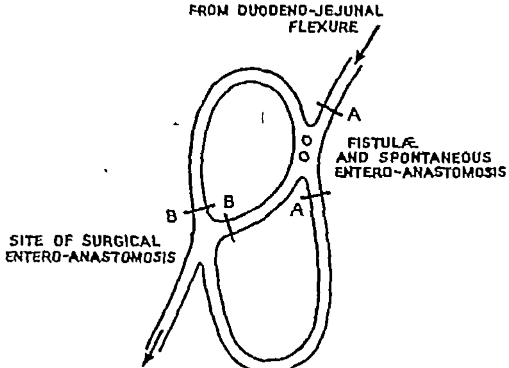
FROM DUODENO-JEJUNAL FLEXURE
A
FISTULÆ AND SPONTANEOUS ENTERO-ANASTOMOSIS
B
B
A
SITE OF SURGICAL ENTERO-ANASTOMOSIS
TO ILEUM

Fig. 2—Appearance of small gut found at seventh operation: A, site of future anastomosis; B, site of future resection (see fig. 3).

steadily, though both fistulæ were open and discharging freely.

On May 31 the patient's general condition was very good; the skin wound was much smaller, and both fistulæ were active. During the next fortnight there was very little progress, and the dried-milk dressing was changed for a mixture of soya flour and dried milk. With this dressing, the rest of the wound healed except in the immediate vicinity of the fistulæ, which appeared to be growing larger and discharging more. On July 5 an attempt was made to close the fistulæ with a rubber button inside the gut and another outside the gut, both held in position with thread ties. This reduced the amount of external discharge, but even after four weeks there was no change in the size of the fistulæ and there was no evidence of healing. Since each fistula was a fairly large opening with no track but simply mucosa pouting through thin skin, it was apparent that it would not heal spontaneously. The patient's general condition was much better than it had been, and the skin was in good condition; so it was decided to operate on the fistulæ.

Seventh Operation.—On Aug. 9, under general anæsthesia, an elliptical incision was made to include the fistulæ and scar. Normal tissue was found above and below, and the peritoneal cavity was opened. No adhesions were found, in spite of the six previous recent abdominal operations. The ellipse of skin with the attached loops of gut was easily freed and delivered. The gut was traced from the duodenojejunal flexure. There were two sites of anastomosis, a spontaneous one in the region of the fistula and another lower down which had been made to relieve the last attack of intestinal obstruction. The whole had a figure-of-eight appearance (fig. 2). The fistulous area was resected and an end-to-end anastomosis was done; the redundant loop was cut away next to the entero-anastomosis and the blind ends were closed (fig. 3). The abdomen was closed with through-and-through 'Nylon' sutures and deep thread through peritoneum and linea alba. The patient was put on intravenous saline and gastric suction.

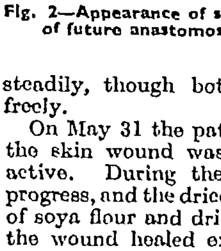

Fig. 3—Resection of fistulous gut and anastomosis done at seventh operation: A, anastomosis; B, closed gut.

His general progress after operation was extremely satisfactory, and within a few weeks he was up and about. The wound suppurated for some time, and the thread sutures were discharged at intervals. When the patient was discharged, there were still some small stitch sinuses and a ventral hernia, for which a belt was ordered.

DISCUSSION

This patient had in turn:

(1) Volvulus of the sigmoid colon reduced.
(2) Recurrence of the volvulus, excision of loop, and colostomy.
(3) Small-bowel obstruction.
(4) Severe paralytic ileus.
(5) Second small-bowel obstruction.
(6) Ruptured abdomen.
(7) Closure of colostomy.
(8) Small-gut fistulæ.
(9) Resection of fistulæ.

The main interest of the case lies in: (1) the surp
number of complications that developed and the
that the patient successfully recovered from seven
abdominal operations within fewer months; (2) th
that his volvulus recurred so quickly in spite of derot
and drainage of the loop with a rectal tube; and
useful method of dealing with intestinal fistulæ
principle being to provide adequate protein, carbohy
and fat in the dressing so as to use up the enzymes i
succus entericus and prevent them from acting o
adjacent tissues. Such a dressing needs frequent ren

I wish to thank my senior colleague, Mr. H. L. Full
allowing me to treat this case. The patient's recovery
face of so many disasters was largely the result of the un
efforts of Sister Holmes and her nurses.

Preliminary Communication

REDUCING SUBSTANCES IN CERVICA MUCUS

DURING the follicular phase of the menstrual
healthy cervical mucus sustains the life and motili
spermatozoa for several days.[1] Since the surviv
human spermatozoa seems to be conditioned by
sugar content of the medium,[2] it seems likely that he
cervical mucus supplies this source of energy to
matozoa. Pommerenke[3] reported that cervical n
contained reducing substances (obtained by hydro
which he said were demonstrable at any stage o
menstrual cycle. We also have found reducing
stances, both free and conjugated, in experiment
which cervical mucus obtained with syringe or fo
was examined by Nelson's quantitative methods fo
determination of sugars.[4] Our findings suggest
relationship between the phases of the reprodu
function and the secretion of free reducing substa
by the cervix. We have since found that this relat
ship can be demonstrated by a simple qualitative te

Procedure.—The cervix is exposed with a dry spec
and swabbed with dry cotton-wool. A small tig
wound cotton-wool swab is next inserted into the cer
canal to a depth of about $^1/_2$ in. twisted several time
that a little mucus adheres, and then withdrawn.
swab is next dropped into a test-tube and cov
with a suitable *alkaline* copper reagent—e.g., Somo
reagent. It is then boiled for 60–90 sec., after which
tube is cooled under the tap and Nelson's phos
molybdic acid reagent is added to the cooled li
(about 1 ml. per 1 ml. of copper reagent).

Thorough mixing is effected. The presence of redu
substances is *indicated* by the immediate developm
of a *deep* blue in the fluid or upon the surface of the s
or *in both fluid and* swab. In the absence of redu
substances the swab and fluid become almost colourl
It is advisable to run a blank control swab *in case*
doubt, and in any case until familiarity with the co
reaction has been acquired. The positive reaction
usually very pronounced, since the concentration
free reducing substances, if present, expressed as gluc
is usually high; it may amount to 550 mg. per 100
—i.e., *more than* is present in other normal body fluid
whereas, on the other hand, the *reaction is positive* w
a total concentration of 0·02 mg. equivalent to gluc
on the swab.

Disturbing Factors.—If the swab is *mounted* on
wooden rod it may be left on this during the reacti
If a metal holder is used, the swab must be taken

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1. Barton, M., Wiesner, B. P. *Lancet*, 1944, ii, 563.
2. MacLeod, J. *Endocrinology*, 1941, 29, 583.
3. Pommerenke, W. T. *Amer. J. Obstet. Gynec.* 1947, 52, 102
4. Nelson, N. *J. biol. Chem.* 1944, 153, 375.

THE LANCET

LONDON: SATURDAY, NOV. 27, 1948

International Campaign Against Tuberculosis

TERNATIONAL effort has not kept pace with the ances made in many national anti-tuberculosis mes. In the United States the Federal governt, the U.S. Public Health Service, the National erculosis Association, and other voluntary bodies banded together in a comprehensive attempt not ly to control but to eradicate the disease. In own country legislation has not lagged behind, gh much more could be done by better coördina- between the various agencies concerned. In dinavia a lead has been given particularly in the ication of tuberculin-testing and B.C G. vaccinaon a large scale. But these endeavours have no international counterpart.

recent months, however, steps have been taken arrow the gap that has separated national and national enterprise At last something is being to bring national authorities closer together and romote personal contacts which have previously too few and far between. The leader in the governmental field is, quite rightly, the World lth Organisation, with its headquarters at Geneva, an account of the first year's work has lately given by Dr. J. B. MCDOUGALL.[1] Recommenda- made by an expert committee and accepted at first meeting of the World Health Assembly last include the following:

- a) The provision of travelling fellowships to countries most in need, principally to train doctors in administrative, laboratory, epidemiological, and clinical work. The aim is to award about 50 of these fellowships in 1949. The candidates selected will be those who will be returning to responsible positions in the anti-tuberculosis campaigns in their own countries.
- b) The preparation from time to time of information for the use of physicians and others who may ask about recent developments. It is intended to provide textbooks and articles for circulation to countries which of late years have not had full access to the literature.
- c) The sending of demonstration teams, at the request of governments, to countries where new schemes are to be introduced. These field demonstrations are meant to show what the countries themselves might later do. They have already been undertaken in China, Greece, Poland, India, and elsewhere.
- (d) The establishment of uniform procedures in such matters as the classification of tuberculosis, X-ray interpretation and mass radiography, laboratory diagnosis, and the evaluation of chemotherapeutic agents such as streptomycin. A subcommittee on streptomycin has already met.[2]

One of the most important functions of W.H O. is work with other international organisations, and cordingly a joint committee has been formed with the United Nations International Children's Emergency Fund (UNICEF) to consider policy in anti-tuberculosis work of an emergency nature. Much attention has been paid to B.C.G. vaccination, which is to be undertaken on an unprecedented scale, some $5 million having been set aside for the purpose. The actual field work has been undertaken by UNICEF and the Scandinavian group of countries, and already much has been done in Poland, Yugoslavia, Czechoslovakia, Hungary, and Finland. The principal object is to vaccinate negative reactors to tuberculin and to protect them by the intradermal injection of B.C G., and an extension of the scheme into Asia (India, Ceylon, China, and the Philippines) and Africa (Tunis, Morocco, Algiers, and Egypt) is contemplated. Teams for this campaign will number at least 200 in Europe alone, and much credit must be given to the Danish Red Cross Society for the part it is playing. The personnel for the initial work has been supplied almost entirely by the Scandinavian countries, and Dr. JOHANNES HOLM, of Denmark, is the chief supervisor of the work, assisted by a member of the staff of W.H.O. It is proposed that W H O. shall continue this campaign as and when the emergency organisation (UNICEF) ceases its activities. Meanwhile, the joint committee has also been considering the sending of streptomycin to countries which ask for it; and, provided these countries are prepared to follow the routine of administration recommended by the W.H.O. subcommittee, supplies will be made available. Also staff and equipment will be sent to improve the laboratory side of the diagnosis of tuberculosis. Requests for laboratory aid and for streptomycin are now coming in from many countries.

It is good news also that the International Union against Tuberculosis (with headquarters in Paris) is likely to be reorganised in a manner consistent with its responsibilities in the voluntary field. Its constitution is to be revised; an executive director with wide powers is to be appointed; and it has been granted affiliation with W.H.O. This illustrates the way in which the various international units against tuberculosis are at last being grouped for a general offensive. If the International Union can bring the voluntary agencies together as successfully as W.H.O. is associating the governmental bodies, the anti-tuberculosis campaigns in many countries having undeveloped programmes will receive much-wanted support.

Management of Hæmophilia

ON the present view hæmophiliacs suffer from a congenital failure to release thromboplastin when their blood is shed; so the first step in blood-coagulation—the formation of thrombin from prothrombin in the presence of ionised calcium and thromboplastin—is seriously hindered. It is agreed that both platelets and a plasma factor are concerned in the proper production of thromboplastin.[1] QUICK[2] contends that there is a plasma factor, thromboplastinogen, which, when activated by another factor released by disintegrating platelets, forms thromboplastin: in hæmophilic blood there is no thromboplastinogen, so the platelet activator has nothing to act on and clotting of rheumatic inflammation. A daily dose of 10–12 g. generally results in about this concentration, which Gross and Greenberg believe should be built up as rapidly as possible, intravenously if necessary. The use of salicylate derivatives in tuberculosis is mentioned, but the revived interest in this subject was only just bearing fruit as the book went to press. Like its companion volume on acetanilide, this monograph is careful and valuable.

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[1] *Tubercle*, September, 1948, p. 208.
[2] See *Lancet*, Oct. 16, p. 626.

[1] *Lancet*, 1947, ii, 798.
[2] Quick, A. J. *Amer. J. med. Sci.* 1947, 214, 272.

The Question of Lay Analysis

An Introduction to Psycho-analysis. SIGMUND FREUD, foreword by ERNEST JONES, M.D. London: Imago Publishing Co. 1948. Pp. 81. 9*s.*

Professor Freud was always beguiling. In this book he leads us, in the Socratic manner, to the absurdities of antagonism to lay analysis—or psycho-analysis for that matter. His case is that lay psycho-analysts are competent to analyse, while doctors who are equally competent are rare. The need for psycho-analysis is still increasing, whereas the rate of increase of competent doctor psycho-analysts cannot be proportional. If a medical qualification is insisted on, the tendency will be for the psycho-analytic part of the qualification to become more and more a mere addition to a medical degree, and in the end the purity of the psycho-analytic approach will be swamped by the ordinary therapeutic approach of the doctor. This case is powerful, and any attempt to keep a great man's contribution to society pure should be respected, especially if that contribution really led to a revolution in thought, as Freud's did. Nevertheless, either medical culture must assimilate psycho-analysis or psycho-analysis must assimilate medical culture—a very improbable consummation. While the slow assimilation of psycho-analysis by medicine is in progress lay psycho-analysts can be valuable catalytic agents. At the same time we must remember that understanding of psychosomatic medicine is spreading rapidly, and the psychosomatic disorders can seldom be treated satisfactorily by practitioners who lack a medical qualification. The cases suitable for treatment by the lay analyst must be carefully selected; the selection becomes even more difficult when other systems of psychological thought and treatment, as respectable as Freud's, are taken into account. It is on the question of demarcating their sphere of activity that Professor Freud's thought is least adequate.

Problems of Fertility in General Practice

MARGARET HADLEY JACKSON, M.B., JOAN MALLESON, M.B., JOHN STALLWORTHY, F.R.C.S., KENNETH WALKER, F.R.C.S. With a foreword by Sir EARDLEY HOLLAND, F.R.C.S., F.R.C.O.G. London: Hamish Hamilton Medical Books. 1948. Pp. 248. 17*s.* 6*d.*

SUCH a book as this has long been needed. About a quarter of it is devoted to contraception, and besides much useful information on various methods this section contains valuable and sensible chapters on coitus interruptus and on the safe period. The greater part of the book, however, is concerned with the investigation and treatment of infertility; and here it seems that the authors have been too modest in their choice of title, for there is much to interest the consultant as well as the general practitioner. Nevertheless, consideration of the problem of a couple who consider themselves subfertile must always begin—and may end—with the family doctor, and he is perhaps too apt to refer them—or one of them—to a "specialist," thus placing their difficulties at once on the plane of the abnormal. Often all that is really needed is a careful history, a relatively limited examination including a postcoital test, and finally some sound and sympathetic advice. Hence the preliminary "statement of the problem" might well have been expanded to say how far the interested general practitioner is justified in carrying out investigations himself. Likewise the single chapter on abortion might have been extended, for it concerns the practitioner very closely. The woman who has miscarried, or threatens to do so, consults her doctor more readily than does the woman who has primary infertility, and she confronts him immediately with the question of direct treatment. In this connexion the value of progesterone is discussed rather too optimistically, and no mention is made o recent work on the possible value of the œstrogens nor is there any reference to the common type of abortio (initial or repeated) associated with a defective fertilise ovum. Much hormone therapy has been wasted i attempts to treat as a "threat" an abortion which h been inevitable from the outset.

The authors are to be congratulated on their avoidanc in general, of dogmatic statements on controversi subjects, and special praise is due for the way in whic artificial insemination is handled, and for the sensib and helpful chapter on coital problems, with its admissi of, and useful advice on, the common difficulty of di cussing such matters with the uneducated man a woman. In a book intended for general practitione more might perhaps have been said about the uses, a especially the abuses, of œstrogen therapy, and the read may be left with rather too hopeful an impression of t value in general of hormone therapy both in male a female.

Additional features of interest are a short section genetical problems, and an appendix with some da on existing contraceptive clinics and appliances proved value, the technique of seminal analysis, and t organisation of a subfertility clinic.

Clinical Toxicology (2nd ed. London: H. Kimpt 1948. Pp. 373. 22*s.* 6*d.*).—Prof. Clinton H. Thienes a Mr. Thomas J. Haley, PH.D., disclaim any originality in t American handbook, which endeavours to cater for t diagnostician and the analyst. In this country, of cour no one practising clinical medicine and requiring a work knowledge of toxicology ever analyses any substance, but t book will be of some use to the practitioner as a rapid refere in cases of poisoning; the skilled analyst will find in i symposium of the identifying tests listed in textbooks toxicology. A great deal of information is collated, and it on the whole adequate to the restricted use for which it intended.

Zinsser's Textbook of Bacteriology (9th ed. New Yo and London: Appleton-Century-Crofts. 1948. Pp. 992. $1 —This edition, of which Dr. D. T. Smith and Dr. D. Martin, of Duke University, are principal editors, reta the biological approach to bacteriology while it also ca for the public-health worker and the clinician. The rewrit of chapters on bacterial metabolism, immunology, and fung and virus diseases, and the introduction of a new section o antibiotics have improved this standard American t Bacterial ecology is given space, and the importance of spo taneous mutation in the study of bacteria is emphasised. T information is accurate and the many illustrations inclu excellent electron-micrographs.

A Short Practice of Surgery (8th ed. London: H. K Lewis. 1948. Part I, pp. 224 and part II, pp. 195. 52*s.* 6*d.* th set of 5 parts).—This popular textbook of surgery by M Hamilton Bailey and Mr. McNeill Love is now to appear in fi volumes, with the object of keeping the material up to dat It is proposed to issue the parts at intervals of about tw months. Part I of the 8th edition enhances the reputatio which previous editions have gained for up-to-date informatio and beautifully clear illustrations. It comprises 224 pag of text and covers the same ground as the 7th edition i 8 fewer pages. It is good to see the section on the treatment of burns rewritten and to note that tying of the angul vein in carbuncles of the upper lip is not mentioned. Part II covering the intestines, liver, gall-bladder, pancreas, an spleen, contains an extra chapter on peptic ulcer, to emphasi the importance of the subject. There are now paragraph on Banti's syndrome and porta-caval anastomosis, and many lesser revisions of arrangement and illustration. Small point for friendly criticism are: the absence of all mention of the part played by the emotional state in producing peptic ulcers, in which context the work of Wolf and Wolff might receive brief attention; the diagram to illustrate excision of the head of the pancreas, in which the arrows should be reversed and the common bile-duct and pancreas anastomosed above the stomach; and the advocacy of cholecystgastrotomy for irremediable obstruction of the lower common duct, anastomosis to a defunctional loop of jejunum giving a better chance of excluding beer, porridge, &c., from the biliary tree.

such dependence on exceptionally skilled attention. So many of the new treatments are of this type; exsanguino-transfusion for acute leukæmia, supporting transfusions for aplastic anæmia, the special technique needed for nitrogen mustard administration —all these make great demands on the time of doctors that can hardly be met outside the special teaching hospital clinic. In the U.S.A. it is apparently possible to entrust these repeated intravenous infusions to the blood-bank nurse; it is doubtful if this would be allowed here. And what of the almost crippled hæmophiliac who is given, for some months, a taste of normal life at the price of absolute dependence on the special clinic facilities? For if he misses one infusion his hæmorrhages will recur. The preparation alone of the special plasma needed every 3 or 4 days must involve much labour. But similar difficulties were met, and solved, in the treatment of diabetes and Addison's disease; and perhaps now that we know the site of the missing factor in hæmophilia further progress will lead to simpler methods for the continuous control of the coagulation defect.

Vitamin-E Therapy

Vitamin E (tocopherol) was discovered some twenty-five years ago during experiments on the effect of dietary restriction on the breeding-power of rats. Since that time many disorders not specifically related to reproduction have been attributed to its deficiency. In various animals these have included muscular dystrophy[1]; brown pigmentation of the uterus, skeletal muscles,[2] and adipose-tissues[3]; exudative diathesis[4]; encephalomalacia[5]; renal abnormalities[6]; ceroid pigmentation of the liver[7]; and the economical use of protein[8] and vitamin A.[9] Such findings suggest that the vitamin has a wide sphere [illegible] activity, exerting its powerful anti-oxidant action [illegible] many different biochemical systems.

Of vitamin E in man we know much less. Its presence in human tissues can certainly be detected by biological[10] and chemical[11] tests. There is evidence, too, that during gestation it is transferred from the maternal circulation to the fœtus.[12] But not everyone agrees even that vitamin-E deficiency is a significant cause of failure of reproduction—despite the encouraging first reports on habitual abortion.[13] Trials in muscular dystrophy and allied conditions have usually proved disappointing,[14] though it should be remembered that its administration has only limited success in dystrophic rats once these have become paralysed as the result of deficiency.[6] The surprising claim of Milhorat and Bartels[15] that in human muscular disorders the absorption of vitamin E is defective through its failure to conjugate with inositol has not yet been confirmed. The hope that vitamin-E medication may prove useful would indeed have receded but for the faith of Evan Shute, in Canada, who has had long experience in the treatment of both pregnant and non-pregnant patients with wheat-germ oil concentrates and later synthetic tocopherols. While his early investigations indicated that vitamin E might be beneficial in emergencies such as abruptio placentæ[16] or premature labour,[17] he has concentrated latterly on its use in cardiac and vascular diseases[18] From experience of 1500 cases of every type of heart disease he concludes that vitamin E is both effective and safe; that 80% of cases improve continuously; and that even in the worst cases the improvement may sometimes allow greatly increased activity. These beneficial effects he ascribes to the action of the vitamin in decreasing the permeability and increasing the dilation of the capillaries, in decreasing the anoxia of the cardiac muscle, in preventing further thrombosis and resolving existing thrombi, and in softening and relaxing scar tissue by invasion with fresh blood-vessels. He also claims that for the same reasons the vitamin is valuable in the treatment of indolent ulcers, arteriosclerotic gangrene, thrombophlebitis and phlebothrombosis, cerebral thrombosis, thromboangiitis obliterans, purpura, and even defective powers of vision and dark adaptation. Furthermore, Burgess[19] has found vitamin E effective in collagenoses such as atopic dermatitis, granulomatous ulceration of the leg, sclerosis of the legs, and lupus erythematosus. On the other hand, other workers have been less successful in substantiating Shute's claims. Thus Makinson et al.,[20] after comparing vitamin E with phenobarbitone, aminophylline, and calcium lactate in 22 cases of angina pectoris, concluded that it has no value in this condition; and Ball[21] was equally unimpressed after tests on 10 cases Similarly in 13 cases of angina pectoris, and chronic heart-failure secondary to myocardial infarction or chronic rheumatic valvular disease, Levy and Boas[22] found that massive doses of 200–800 mg. daily were ineffective, even when given for several weeks.

Since Shute himself is not disturbed by the lack of controls in his investigations, and even hints that ideas and controls may be incompatible, we might well hesitate before accepting all his conclusions, even if there were no contradictory results. At the same time it is well to remember the conclusive evidence from animal experiments that vitamin E does in fact participate both in maintaining the normal permeability of capillaries and in protecting heart muscle from degeneration. Thus in experiments with chicks Dam[4] found that deficiency of vitamin E causes "exudative diathesis," characterised by an undue fragility of the capillaries with a resulting tendency to œdema. In the rat Mason[23] found that partial deficiency of vitamin E causes vascular abnormalities of the fœtus, with variable degrees of dilation and thrombosis, hæmorrhage, and sometimes œdema. In dogs with experimental kidney injuries Holman[24] found that vitamin E prevents does not begin. Brinkhous,[3] however, from very similar experimental observations, concludes that the missing plasma factor acts by releasing thromboplastin from the platelets, and he names the factor a "thrombocytolysin." For the purposes of the clinical management of hæmophilia we are therefore safe in assuming that it is a factor—be it thromboplastinogen or thrombocytolysin—present in normal plasma that is missing in hæmophilia; consequently if normal blood or plasma can be supplied to a hæmophilic patient his blood can be made to clot normally. This observation, originally made 43 years ago by Sahli, explains the special value of blood-transfusion in hæmophilia in addition to any replacement of lost red blood-cells. In America a plasma fraction retaining this plasma factor was obtained in association with a globulin but free from fibrinogen and prothrombin.[4] This purified plasma factor could be dried, and a dose of 200–600 mg. given intravenously promptly reduced *the coagulation-time of a hæmophiliac to normal*; the effect was maintained for 5–8 hours.[5] Potent fractions such as these are still not generally obtainable, but it is possible to design a rational scheme for the control of hæmophilic bleeding by using whole blood or plasma, both of which are now readily available. And it looks as though we should relegate to obscurity the extracts of lung and spleen, the egg-white preparations, and the other materials that have been proposed for this purpose.

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[2] Martin, A. J. P., Moore, T. *Chem. Ind.* 1936, 55, 236.
[3] Dam, H., Granados, H. *Science*, 1945, 102, 327.
[4] Dam, H., Glavind, J. *Nature, Lond.* 1938, 142, 1077.
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[12] Athanassiu, G. *Klin. Wschr.* 1947, p. 362.
[13] See Bacharach, A. L. *Brit. med. J.* 1940, i, 890.
[14] Fitzgerald, G., McArdle, B. *Brain*, 1941, 64, 19.
[15] Milhorat, A. T., Bartels, W. E. *Science*, 1945, 101, 93.
[16] Shute, E. *J. Obstet. Gynæc.* 1937, 44, 121.
[17] Shute, E. *Amer. J. Obstet. Gynec.* 1942, 44, 271.
[18] Vogelsang, A., Shute, E., Shute, W. *Med. Rec.* 1948, 161, 83.
[19] Burgess, J. F. *Lancet*, Aug. 7, p. 215.
[20] Makinson, D. H., Oleesky, S., Stone, R. V. *Ibid*, 1948, i, 102.
[21] Ball, K. P. *Ibid*, p. 116.
[22] Levy, H., Boas, E. P. *Ann. intern. Med.* 1948, 28, 1117.
[23] Mason, K. E. Essays in Biology. Berkeley, 1943; p. 400.
[24] Holman, R. L. *Proc. Soc. exp. Biol. Med.* 1947, 66, 307.

The patient with hæmorrhage due to hæmophilia is easily detected; bleeding from a minor injury or after a tooth extraction has gone on steadily for a long time, or he has hæmarthroses. Even a rough estimate of the coagulation-time of the blood is usually sufficient to confirm the diagnosis of hæmophilia: 1 ml. of venous blood is put into a small test-tube about 8 mm. in diameter, and in a normal person the blood will clot firmly within 4–10 minutes at room temperature, or 2–4 minutes at 37°C; hæmophilic blood will remain uncoagulated for longer (sometimes much longer) periods and the clot will be poor. This simple test will quickly distinguish the "bleeder" who suffers from recurrent hæmorrhage after tooth extraction because of defective capillary closure—patients often confusingly named "pseudohæmophiliacs"; and the test is particularly reliable since the only other condition that causes similar prolongation of coagulation is the extremely rare congenital afibrinogenæmia. *Family history is not always* reliable, since a positive history is not obtained in every case of hæmophilia—there are not a few apparently sporadic cases—and there may be a family history in the pseudohæmophilic group, though both sexes are usually affected. Having made sure that the condition is hæmophilia, the immediate treatment of hæmorrhage is transfusion of fresh blood—i.e., blood used within half an hour of withdrawal. Fresh blood must be used because the plasma factor is labile in whole blood.[6] Blood-transfusion must be repeated if the hæmoglobin and red-cell levels are low, and again at least every 72 hours since it has been shown that the coagulation-time of the blood returns to its previous level in about this time. Minor operations like tooth extraction can be undertaken in hæmophiliacs if proper precautions are taken. Befor the extraction the dentist makes a mould to fit th jaw and keep a dressing firmly in the socket. Th patient is transfused not more than, say, 5 or 6 hour before the extraction. The sockets are firmly packe and the mould used to keep the packing in place suturing the gums is bad practice in these patient and often leads to troublesome ulceration. Furthe transfusions are given on alternate days until a oozing has ceased and healing looks firm. All th necessarily means admission to hospital, usually f 10–14 days.

In our present issue Schiller, Neligan, an Budtz-Olsen, of Oxford, show that, when t necessity for frequent (almost daily) blood-transfusi is recognised, and full coöperation with the physici is maintained, even major surgery can be undertak with a fair chance of success There can be few mo hazardous operations than the one they report, which a subdural spinal hæmatoma was remov through a laminectomy wound. The postoperati progress of their patient, a little boy of 16 mont shows another difficulty that has to be faced hæmophilia—slow healing of the wound. This com plication was successfully met by the use of t modern absorbable hæmostatic materials, fibrin fo and oxidised cellulose; but the wound still took t weeks to heal.

Alexander and Landwehr[6] have now carried t treatment by the provision of plasma factor a st further. They gave regular infusions of norm human plasma to four severely affected hæmophi patients and so kept their coagulation-time norm or nearly normal for long periods—10–20 mont Johnson[7] had done this before but only for 3 mont not really long enough for proper assessmen Alexander and Landwehr did not use the sto plasma; they prepared a special plasma that w separated and frozen within half an hour of withdraw so as to preserve the maximum antihæmophil activity. An intravenous infusion of 150 ml. restor the coagulation-time to normal levels very quick and it remains normal for 24 hours; the coagulatio time rises slowly during the next 24 hours and ris to its previous level within the third 24-hour perio Intramuscular injection was much less effective. A four patients could undertake more or less norm activities so long as they received these infusio three or four times weekly. Some hæmorrhag episodes did occur, and an interesting point is th infections seem to have played a part and that the were controlled by penicillin, which has no clo promoting activity.[8] This treatment is not, so fa available for hæmophiliacs in this country. For tunately few of them are so severely affected a Alexander and Landwehr's four patients; mos hæmophiliacs have long remissions when there ar no spontaneous hæmorrhages and minor injuries d not have serious effects, so long as the large blood-vessels are not damaged.

This kind of treatment again raises the questio of the practical value of measures that involv a great many specimens of fossil apes (some very fragmentary) which have been collected by the British-Kenya Miocene Expedition during the last two years. One of the significant results of this expedition has been the demonstration that, so far back as Early Miocene times. an astonishing variety of primitive and generalised anthropoid apes were already in existence in East Africa —ranging from small gibbon-like forms to great creatures of gorilloid dimensions. Arising out of this remarkable diversity, it is of course possible that certain types appeared which, much later, led on by a process of evolutionary development to the Hominidæ. Certainly, the time factor required for such a transformation no longer seems a difficult problem. Apart altogether from such considerations, however, these fossil remains provide most important material for elucidating the relationship of the anthropoid apes to the cercopithecoid monkeys. They are thus in some measure complementary to the fossil ape-like creatures (Australopithecinæ) of which, incidentally, still more important discoveries have quite recently been reported in South Africa. For while the South African fossils—even though their precise status is still unsettled—have obviously an important reference to the problem of the origin of Man from an ape-like ancestral stock, the East African fossils provide evidence bearing on the origin of the whole anthropoid ape group (including, of course, the actual progenitors of the human family) from still more primitive forms. Dr. Leakey and his colleagues are to be congratulated on the results of their excavations in Kenya, the success of which is due to an unusual combination of great physical energy and high technical skill. It is to be hoped that funds will be forthcoming to make possible a continuation of the work of the British-Kenya Miocene Expedition next year.

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[3] Brinkhous, K. M. *Proc. Soc. exp. Biol., N.Y.* 1947, 66, 117.
[4] Lewis, J. H., Tagnon, H. J., Davidson, C. S., Minot, G. R., Taylor, F. H. L. *Blood*, 1946, 1, 166.
[5] Lewis, J. H., Soulier, J. P., Taylor, F. H. L. *J. clin. Invest.* 1946, 25, 876.
[6] Alexander, B., Landwehr, G. *J. Amer. med. Ass.* 1948, 138, 174.
[7] Johnson, J. B. *Ibid*, 1942, 118, 709.
[8] Macht, D. *Fed. Proc.* 1947, 6, 160.

SISTERS IN THE MAKING

The King's Fund, always fertile in good ideas, and never afraid to try them, are going to start a preparatory course for staff nurses about to become ward sisters. In a memorandum,[1] just issued, the general plan of such course is set out.

The studies of the Working Party, reinforced by opinion in many quarters, have shown how urgent is our need to build up the body of trained nurses in our hospital wards. Many newly qualified nurses leave the profession —in order to marry, to enter other branches of nursing, to take a midwifery course, or for many other reasons. The post of ward sister does not capture their imaginations as it should; yet in no other appointment does the nurse get such unequalled opportunities for the direct care of patients or the training of the young entry. Doubtless newly qualified nurses are influenced partly by an urgent need to escape from the maternal restrictions of the nurses' home, and doubtless, too, financial considerations have an effect; and these two causes of wastage must be corrected. Nevertheless, it seems that some girls really hesitate at the prospect of the responsibility, for which they feel they have been ill prepared. Others more ambitious, find that the post of ward sister does not at present offer them the same chance of distinction as other branches of the profession. The King's Fund course is being planned to give the doubting girl confidence, and to help the ambitious girl to appreciate the full scope and opportunities offered by ward work.

Students nurses are often annoyed and frustrated by the lack of ward teaching, and by the fact that their classroom work is not sufficiently related to their ward duties. Staff shortages make it difficult for the sister to teach as much as she should, and in many hospitals sisters are apt to leave all that side of their work to the tutors. A practical course in methods of teaching, the King's Fund believe, would help the ward sister to give clear explanations and instructions, to demonstrate methods of treatment, and to realise how much guidance the student needs before she is left to carry out nursing procedures alone. Staff management has been studied much of late in industry, and many of the lessons learned can be applied in nursing. "Young sisters," the King's Fund memorandum suggests, "may not have learned to carry authority, to give simple direct instructions, to correct impersonally, to delegate responsibility to their staff nurses." It is a commonplace that an ungracious manner in a sister can lose nurses to the profession; and if few are naturally good at managing other people, yet, as the memorandum notes, all can profit by training. Again, insight into business methods and the elements of general administration of a hospital would give a nurse a good background for running a ward; and the actual ward administration, it is suggested, can best be learned during a term of apprenticeship, the novice working with a sister in a well-run ward.

The curriculum is merely outlined in the memorandum, for it is to be allowed to evolve; but the course will last 15 weeks, half of which will be spent at the staff college, and half in selected hospitals where the students will work as supernumeraries. The project will prove of great importance if it has its intended effect of restoring to the post of ward sister much of its original status, and of introducing into many hospitals the practice of the best.

AFRICAN PROSPECT

As the first Sims Commonwealth professor, Sir Hugh Cairns spent the first three months of this year in Australasia,[1] and he has now reported on a tour during August and September in Southern Rhodesia and the Union of South Africa.[2] This second tour proved very different from the first, for in Australasia the medical problems of an English-speaking white population differ little from those of Britain. In South Africa, however, Cairns found two of the medical schools to be bilingual, while the third is primarily Afrikaans-speaking; moreover, "varying shades of nationalism" find their way into medical affairs, and towering above all else is the problem of disease in the native and coloured population. Though he recognises that splendid work has already been done on behalf of the native Africans, often in the face of great difficulties, he regards their malnutrition and ill health as the most important medical problem in Africa today. He mentions that the incidence among them of bilharzia, hookworm, and other tropical diseases, and of venereal disease and malnutrition, is so high that it is hard to know how to begin to treat them with existing means. In Durban, at the King Edward VIII hospital for natives, there are 2000–2500 cases of amœbic dysentery yearly, with a 10% fatality-rate; at Makerere, in Uganda, with its native medical school, 100–150 cases of pneumococcal meningitis are admitted yearly, and the results of penicillin treatment are not yet satisfactory. There is evidently no universal body of opinion that this problem should be tackled forcibly, since Cairns notes that the need for more systematic attempts to solve it was expressed only "in some parts" of Rhodesia and South Africa. It is, unfortunately, closely linked with questions of economy and education. How can the natives become healthy, he asks, until they have enough food and use it intelligently? Many broad questions need answering. What is the state of health, and what the standard of intelligence, of natives in different parts of Africa ? What systematic attempts are being made to survey and eradicate the various the development of arteritis. Lambert[25] is enthusiastic over the value of the vitamin in the treatment of aged dogs and cats suffering from heart disease. Cattle deficient in vitamin E, according to Gullikson and Calverley,[26] exhibit progressive electrocardiographic abnormalities, and are prone to sudden death. Mason and Emmel[27] have reported myocardial lesions in rats deprived of vitamin E for long periods, while Moore and his colleagues[6 28] hold that the pigment granules found in the dystrophic muscles of such animals strongly resemble those typical of brown atrophy in the human heart. Shute's surprising claims for the therapeutic value of vitamin E therefore become more plausible when all the known effects of experimental deficiency are considered. Further animal experimentation should indicate clearly the directions in which controlled clinical tests could profitably be undertaken.

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[1] Memorandum to Hospitals on the Need for Courses in Preparation for Ward Sisters' Duties. August, 1948. King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2.

[1] A report of his first tour, in Australasia, was reviewed earlier this year (*Lancet*, 1948, i, 760).

[2] Report to the presidents of the Royal College of Surgeons of England, the Royal College of Physicians of London, the Royal Australasian College of Surgeons, and the Royal Australasian College of Physicians.

For the present it is natural to ask whether vitamin E is deficient either in the average diet or in that of patients suffering from diseases said to respond to its administration. Clearly the doses said to be necessary for successful therapy are greatly in excess of those consumed in an ordinary diet. Thus Burgess's patients with collagenoses were having doses of 100–600 mg. daily, while their food contained only the normal 15–30 mg.; and he concludes that defective absorption or utilisation must be involved. Shute points out that the increased incidence of angina pectoris in America during recent years has coincided with the milling of flour poor in vitamin E; but he emphasises that his patients have derived no benefit whatever from the vitamin in amounts equal to those found in ordinary diets, and he recommends 200 mg. as an average daily dose for the control and maintenance of most patients with heart disease, with up to 900 mg. initially, provided that this heavier dosage is not contra-indicated by chronic rheumatic heart lesions or severe hypertension. He believes that he is using vitamin E not as a food accessory but as a chemotherapeutic agent. Indeed Levy and Boas have noticed that massive doses sometimes cause headache and vertigo; but the clinical significance of these side-effects is still uncertain.

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[25] Lambert, N. H. *Vet. Rec.* 1947, 59, 355.
[26] Gullickson, T. W., Calverley, C. E. *Science*, 1946, 104, 312.
[27] Mason, K. E., Emmel, A. E. *Anat. Rec.* 1945, 92, 33.
[28] Moore, T., Wang, Y. L. *Brit. J. Nutrit.* 1947, 1, 53.

Annotations

THE KING'S HEALTH

On Tuesday a bulletin from Buckingham Palace announced that the King is suffering from obstruction to the arterial circulation in the legs, and that the defective blood-supply to the right foot causes anxiety. The bulletin, which is signed by Sir Maurice Cassidy, Sir Thomas Dunhill, Prof. J. R. Learmonth, Sir Morton Smart, and Sir John Weir, adds that "though His Majesty's general health, including the condition of his heart, gives no reason for concern, there is no doubt that the strain of the past 12 years has appreciably affected his resistance to physical fatigue." Accordingly his visit to Australia and New Zealand, which was to begin on Jan. 27, has been cancelled; but he will continue to carry out his normal State duties at the Palace, including audiences.

Those who appreciate the weight of the physical and mental burden imposed on Royalty by a tour of the kind projected must be glad that this illness has declared itself now rather than later. Its seriousness is all too evident, and is the more impressive because, in a life of service, the King has so seldom allowed himself to be deflected from any public task, whether great or small. Yet there is good hope that, provided the acute phase yields to rest and treatment, it will be followed by a return of health and strength; though possibly, like so many of his subjects at the same age, the King will have to purchase continuing health at the cost of some of his more strenuous activities.

PROCONSUL AFRICANUS

Addressing the Geological Society on Nov. 17 Prof. W. E. Le Gros Clark, F.R.S., gave a short preliminary account of the fossil skull of a Miocene ape recently found on Rusinga Island in Kenya. The discovery was made by Mr. L. S. B. Leakey, PH.D., and Mrs. Leakey last September, during the second season of the British-Kenya Miocene Expedition. Though a number of remains of fossil Miocene apes have previously been found, not only in Africa but elsewhere, these remains have hitherto been almost entirely confined to teeth and fragments of jaws. This is the first occasion on which a skull of one of these early primates has been obtained.

The specimen belongs to a species *Proconsul africanus* originally defined on the basis of the dentition by A. T. Hopwood of the British Museum. The greater part of the facial skeleton has been preserved—almost intact on the right side, but much crushed and distorted on the left. The frontal region of the brain-case is also present and the mandible is complete. The whole of the dentition (of which the third molars had already erupted and undergone some degree of wear) is excellently preserved. Portions of the occipital bone with the articular condyles and also fragments of the petrosal bones, are among isolated fragments which, because of lack of contacts, unfortunately cannot be placed with certainty in their relation to the main skull. From the general dimensions of this skull, it appears that *Proconsul africanus* was somewhat intermediate in size between a large gibbon and a small chimpanzee. It contrasts strongly with the chimpanzee and gorilla in the complete absence of a supraorbital torus; indeed, the supraorbital region has a rather curiously human appearance. This latter feature, however, does not necessarily betoken any special relationship with the Hominidæ, though it may perhaps be taken to indicate that the latter have retained (or regained) certain primitive features which are of much greater antiquity than had been supposed. The skull is markedly prognathous; but, as compared with the modern African apes, this may be partly illusory owing to the difference in the supraorbital prominence; it may also to a slight degree be exaggerated by post-mortem deformation. The contour of the nasal aperture resembles that of the catarrhine monkeys rather than the anthropoid apes, and in some endocranial features such as the presence of a large subarcuate fossa (for the petrosal lobule of the cerebellum), a broad vermiform fossa on the occipital bone, and indications of a relatively small frontal lobe, it appears that the brain was more primitive than that of the large apes of today. The whole skull is very lightly constructed, with a remarkably thin cranial wall.

The geological age of the deposits in which the specimen was found is judged, mainly on palæontological evidence, to be Early Miocene. Since the Miocene period is generally believed to have begun about 35 million years ago, and to have ended 15 million years ago, the estimate of an antiquity of at least 20 million years is probably somewhat conservative. Professor Le Gros Clark pointed out that, though this fossil skull is unique, it is only one of

Reconstruction

THE UNIVERSITIES AND THE HEALTH SERVICE

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SOME time ago a question was asked in the B.B.C. ains Trust: "Where do you think the greatest pository of wisdom is to be found?"—or words to that ect. The reply was "Among university professors"; the aker adding, "because they only work half the year." My purpose here is not to sustain the foregoing prosition, but to point out that present trends are wholly inating its supposed basis. There is today a prosive and ever-increasing burden of affairs, arising ly out of the evolution of medical science, but ravated by the passing of the new Health Act, which coming absolutely intolerable and is removing every ige of the precious leisure so important to the ssors of medical subjects. It is a matter of urgency t the universities decide without delay what is to their future policy; for if the present encroachment inues unchecked there can be little room for wisdom any kind in the hurried life in which we are involved.

A professor is usually appointed on the basis of his tributions to his subject arising from his original stigations, for his reputation for learning, and to some nt on his ability as a teacher. These qualities accrue y through his having had a large measure of free for thought and reading, as well as that spent in actual prosecution of observations and experiments, it is on this that his knowledge and reputation are . Once he is appointed to a chair he has to assume iderable administrative responsibilities for the nisation of an institute or set of laboratories, to ern himself with the problems—scientific, technical, personal—of his staff, and to play his part in the d internal politics of the university to which he is ted. These are all his proper duties and in the ry way they are not oppressive. But certain l professors have, in addition to these, to carry rden of responsibility for the care of patients, whole gamut of modern clinical diagnostic tests, r the provision of a post-mortem service to a ital. This additional work has to go on through whole calendar year and is not eased in the least the arrival of vacations. Such a burden of hospital tice may be, and often is, a crippling one; it orbs the greater part of the professor's time and puts in a very unfavourable position compared with his eagues in, for example, anatomy or physiology, who ry no such responsibilities and can look forward to plete freedom for their own pursuits in their vacations.

If such a state of affairs is, as I submit, undesirable burdensome, it threatens to become an impossible as a result of the impact of the National Health vice. The universities are dragged in as participants, this adds yet another load of administrative work lready laden shoulders. But an even more corroding on is the tendency to regard the professors of the ects of the clinical years of the student's curriculum medical specialists," and thereby servants of the pitals and through them of boards of governors and Ministry, rather than as members of a university . The new administrative machinery makes large s upon the time and energy of the university prosors, who are expected to sit upon an increasing mber of committees concerned with hospital administion and finance, as well as upon quasi-academic bodies led into being by the schemes which have been set foot for the training by postgraduate instruction of "specialists" of the future. Within the past week I have received the minutes and agenda from a hospital rd of governors amounting to 58 pages, and papers from an educational institution amounting to 49 pages: and these represent the labours of only two of the considerable number of committees upon which circumstances are forcing me to sit. Much of this work is not in the remotest degree concerned with learning and the advancement of my subject, for which purpose I was appointed to my present position, and it can only be dealt with by the sacrifice of proper and presumably more useful interests. A great deal of this material is a recent fungous growth, much of it created by individuals who have been appointed to administrative offices which are new creations, and justify their existence by busy promotion of schemes which are of questionable value.

The second danger in our present position is the financial lure which threatens to draw the academic staff of our universities into the group of "hospital consultants." The Spens report has recommended salaries for clinical specialists which appear highly attractive, and this report the Government has accepted "in principle." The highest-paid specialists are to receive a salary of £5000 "in terms of the 1939 value of money" (it will be remembered that this proviso was also made in the ill-fated Goodenough report); and the simple-minded consultants have, it seems, swallowed the bait, each no doubt believing in his own heart that he will be one of the favoured worthies to whom the higher rewards will go. Now, when it comes to assessing merit, it may well be argued that the university professors, who have reached their eminence not by seniority or apostolic succession but by open competition in a nation-wide and often world-wide market, must have high claims for the major rewards; and, confident in this belief, they are exposed to the great temptation of allowing themselves to be classed as medical specialists—a status to which they have every claim on the basis of the hospital work for which they are responsible. On the other hand the universities must regard these astronomical salaries with alarm, for they have to consider the position of many professors in the faculties of arts, science, law, or engineering, and their income is relatively fixed. They may therefore be tempted to get out of a difficult position by moving on parallel lines and letting or even urging their medical professors to become in the main hospital specialists and only in a minor degree university professors in the true sense.

It is known that these problems are engaging the attention of the University Grants Committee and the Committee of Vice-Chancellors, but my general anxieties on the whole problem are aggravated by a fear that in their extremity these bodies may be driven to hurried decisions permanently damaging to the cause of medical science and teaching. At the same time I can appreciate the difficulty of their position in virtue of the responsibility I have towards my juniors. These are on the whole a selected group of medical men of high ability and not too well remunerated. To deny them the rewards offered by the public service to specialists would seem an act of disloyalty. For myself, however, the position is clear. If a choice is to be made between on the one hand the large financial gains offered to hospital specialists, with which must be coupled the conditions of service under the Ministry of Health, and on the other the status and emoluments of a professor with the traditional freedom and privileges of that office, even at a much lower salary, I should not hesitate to accept the second.

However necessary the vast expansion of laboratory services in hospitals of all types may be, it is surely a vital matter to ensure that there shall remain a *corps d'élite* of university professors, in whose lives there shall be time for thought, reading, and that exercise of an inquiring mind which often leads nowhere in particular, but is of itself a worthy pursuit and occasionally leads to unplanned results of transcendent importance to the human race. It is the duty of the universities at this juncture to ensure that this academic freedom shall remain.

diseases? To what extent can natives from various tribes be trained as doctors, medical assistants, and nurses? Cairns suggests that some future Sims professor, preferably "at no distant date," should be an expert in tropical medicine, and experienced in the study of native Africans, and that he should confine his travels mainly to the African continent, visiting not only the British Colonies and the Union, but also French Equatorial Africa and the Belgian Congo, where native medical schools have developed on lines differing from ours.

He was much impressed by the great competence and devotion in caring for the natives shown by many doctors, some of whom undertake both the medicine and the surgery of their hospitals, see a large number of outpatients daily, and turn their hands to big-game hunting when elephant and buffalo are eating their patients' crops. He visited the three South African medical schools, at Pretoria and Cape Town Universities, and the Witwatersrand University at Johannesburg. Plans are being made for the founding of a medical school for native Africans at Durban; and the Cape Town and Witwatersrand schools admit a small number of native, coloured, and Indian students each year. Medical training for non-whites should clearly be provided on a much wider scale, since in the Union there are some 9 million native, coloured, and Indian people to 2·3 million whites. Cairns found surgery of a high standard among both Europeans and non-Europeans in South Africa, and was particularly impressed by surgical teaching in clinical diagnosis and case-presentation. At Johannesburg both practice and research in neurosurgery were of the highest order, judged by international standards, and he regrets that the work is not more widely known: it is sometimes as bad a fault to publish too little as to publish too much.

BOLTJES CONTRA PIJPER

Some time ago[1] we commented on Pijper's theory that bacterial flagella were no more than shreds of "slime envelope" (or capsule) trailed behind a bacillus which progressed by a helical movement of its curved body. It was plain that this iconoclasm would receive its answer, and orthodoxy has found her champion in Boltjes of Amsterdam.[2] Against the elegant experiments and patent logic of his antagonist he matches a wealth of reference and comparison, minute observation, and a beautiful example of electron-photomicrography. This last he claims to refute Pijper's argument that the flagellum is no essential structure, since there was no evidence that it traverses the cell wall; and if we had more experience of the method we might be in a position to agree with one or the other. *Argumentum secundum, tertium . . . octavum*—each in turn draws on experience and analogy to confute heresy, and if at the end we have any doubt remaining it is that in the discussion of physical properties of microscopic structures analogy with macroscopic and tangible bodies may lead to unjustified conclusions. For example Boltjes says: "The way in which a flagellum is pushed aside by swimming bacteria also shows that it is not rigid." Yet we push aside the branches of hazel and briar with similar effect; and they are of very different rigidity. Rigidity and stickiness are both measurable physical properties, and for such arguments to convince they must be measured. That this is so far beyond our technical powers is only a reason for not using these arguments. However, this part of Boltjes's paper is perhaps little more than verbal fencing. His coup-de-grâce lies in his observation that when the stranded bacillus is hard aground the flagellum continues to beat, which is indeed odd behaviour for the inert trailer towed by a moving body. There is an answer to this: that such movement is due to brownian agitation or convection currents: but no doubt Pijper can provide a better one. We hope he can, for in these earnest days it is heartening to witness wise men doing no more than pursue wisdom. Had the members of the senior common-room any time to spare from attending committee meetings, "Boltjes contra Pijper" would provide better postprandial argument than Russian genetics.

THE NEW LEGAL SERVICE

Under the new Legal Aid Bill the English taxpayer incurs an unknown liability while the benefits are confined to persons whose "disposable" income does not exceed £420 a year or whose capital does not exceed £500. Members of the medical profession will have their own views of a social service thus arbitrarily limited in scope. Hitherto in criminal proceedings the legal interests of the "poor person" have been looked after tolerably well. The expense was borne by local rates, and, if the brief fees brought the young barrister no great wealth, at least he was content to gain experience and, for what it was worth, a modest but [illegible] advertisement. The Rushcliffe Committee rightly pointed out that in civil proceedings (apart from divorce) the position was less satisfactory. Poor persons have had no help in county courts or other inferior courts; the income limits (where help was available) were too low, and the recipient had often to make some out-of-pocket payment. Under the new Bill the Exchequer will pay There will be full-scale fees and costs in the county court, and 85% of the taxed fees and profit costs in the High Court, Court of Appeal, and House of Lords. Except in divorce work (where the Law Society's existing scheme will continue) the poor person will have the right to choose his own solicitors and counsel from the panel of volunteers. England and Wales will be divided into 12 areas, with local committees acting through "certifying" subcommittees. The only limit to the prospective benefit, it seems, is that actions in such matters as libel, slander, and breach of promise will for the present be outside the scope of the terms of service. Legal advice will be available at centres where whole-time solicitors will attend. There will be special arrangements for these legal clinics for members of the Armed Forces oversea. A similar Bill for Scotland is on the way.

We must wait for the arguments to be deployed and discussed. The legal profession, not yet nationalised, is to work a plan of State-paid legal service brought within the reach of persons who otherwise could not afford this luxury. Payment by the State is payment by the taxpayers. Will there not be disappointment that those who pay cannot all have the chance of the benefit?

NURSES AND THEIR PAY

Last week we suggested that the salaries proposed by the council of the Royal College of Nursing for staff nurses and ward sisters were too small. We are glad to learn that the figures we quoted from the *Nursing Times* of Nov. 6 were incorrect. On Nov. 13 that journal published the following amended statement of the college's proposals:

> "The proposed salary for the staff nurse is to start at £260, with emoluments assessed at £130; after statutory deductions of £47 3*s*. 4*d*. have been made the net cash salary would be £212 16*s*. 8*d*. Annual increments of £15 will give the maximum salary of £320 in four years.
>
> "The proposed salary for the ward sister starts at £310 per annum, with emoluments assessed at £150, and giving a net cash salary after statutory deductions of £62 9*s*. 4*d*. have been made, of £247 10*s*. 8*d*. Annual increments of £20 will bring the salary to £430 followed after ten years by a further increment of £20 and after another five years by a final increment of £20 making the maximum salary of £470."

These scales would represent a real advance.

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1. *Lancet*, 1946, ii, 871.
2. *J. Path. Bact.* 1948, 60, 275.

33,000, 1:66,000, 1:132,000 . . . .) 0·2 ml. of each dilution added to the appropriate bottle of Tween-albumin medium, that, when 0·2 ml. of culture was added to make a final me of 3·0 ml., the concentration of streptomycin for strains ted before treatment ranged from 2·0 to 0·03 units per ml. s were usually performed in duplicate. The bottles were bated upright with caps screwed tight. They were read r 10 and 14 days' incubation at 37°C, though it was al with the pretreatment sensitive strains for any change occur in the reading at the later period. The sensitivity the strain was expressed as the lowest concentration of tomycin per ml. giving complete inhibition of growth. relationship of this end-point to the end-point for the dard strain put up at the same time was also noted— "two times less sensitive than H37Rv."

When numerous tests were to be set up, it was found nient to add albumin and streptomycin to a series of s containing larger amounts of the medium, say 180 ml., to dispense these with aseptic precautions.

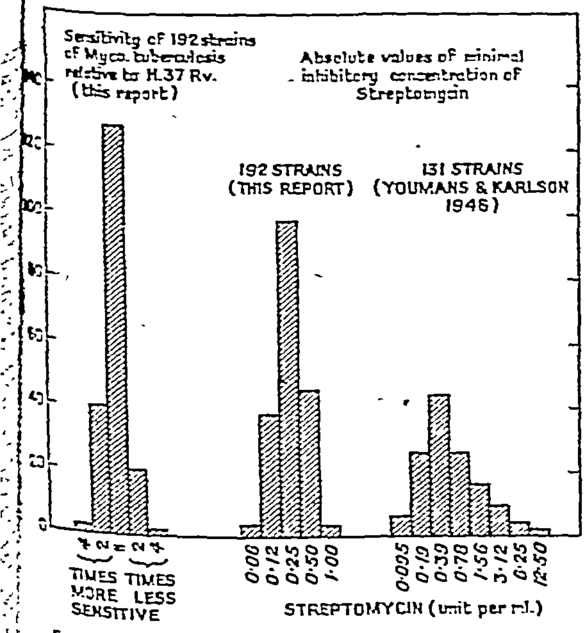
is essential to adopt a safety technique in pipetting le bacilli in this test. Great care should be taken, example, to avoid blowing out the contents of the pipette during the inoculation or before discarding.

RESULTS OF SENSITIVITY TESTS

re Treatment

Altogether 520 cultures of *Myco. tuberculosis* from centres dealing with cases of pulmonary tuberculosis tuberculous meningitis have been tested for streptoin sensitivity before treatment was begun or from ated patients. These strains showed a range of itivity varying from 0·06 to 1 unit per ml. and were e more than four times less sensitive or four times sensitive to streptomycin than the standard strain Rv. Most of the strains fell within a range of itivity of 0·1–0·5 unit of streptomycin per ml. A bovine strains from other sources had the same e of sensitivity.

As a check of the methods used and the results obtained ferent centres, 192 pretreatment cultures, of which came from other centres, were retested by Dr. D. A. son, using the same technique from March, 1947, ly, 1948. Results were analysed in terms of the of sensitivity relative to the standard strain rel. The analysis of variance indicated that, the limits of the accuracy of this test, there is no difference in the sensitivity of strains derived from nt patients. The inherent error of the method proximately one tube up or down from the true in 19 out of 20 tests.



Sensitivity of pretreatment cultures of *Myco. tuberculosis*.

During Treatment

Cultures of cerebrospinal fluid and of sputum, or, where none was available, of laryngeal swab or stomach washings were made at regular intervals during treatment with streptomycin. The results as regards the development of streptomycin resistance have been described in the main reports (Medical Research Council 1948a and b).

Where a resistant strain of tubercle bacillus was expected, a higher range of streptomycin concentrations was used, with a maximum usually of 1000 units per ml. There appeared to be some risk of discrepancy in the reading of tests with resistant strains, since a few days' extra incubation sometimes allowed growth in one, two, or more tubes containing greater concentrations of streptomycin, especially where a resistant strain had only recently appeared. It is therefore particularly important in dealing with suspected resistant strains to read the results after 14 as well as 10 days' incubation.

Comparative Results

The comparative findings when 97 strains isolated and tested for their streptomycin sensitivity at Harefield Hospital, and 41 strains isolated and tested at the Central Public Health Laboratory, were retested at the Brompton Hospital Laboratory were as follows:

	Harefield Hospital	*Central Public Health Laboratory*
No. of strains compared	97	41
No. of patients from whom derived ..	25	14
Results in agreement:		
Range up to 1 unit per ml.	61/64	25/25
Range 1–4 units per ml.	1/4	2/2
Range greater than 4 units per ml. ..	26/29	13/14
Total	88	40
Results in disagreement:		
No. of strains	9	1

Details of strains in disagreement:

Case no.	*No. of strains*	*Harefield Hospital*	*Central Public Health Laboratory*	*Brompton Hospital*
		Minimal bacteriostatic concentration of streptomycin (units per ml.)		
A	1	4		0·25
	2	4		0·25
B	1	50		1·00
	2	10–50		1000
C	1	2		0·25
	2	8		1000
D	1	0·3		0·06
E	1	0·7		0·06
F	1	0·7		0·06
G	1		12·5	1·00

Results are considered to be in agreement when there are not more than two tubes—i.e., a 4-fold—difference between the results obtained. Discrepant readings were obtained with 10 out of 138 strains, mostly among strains showing some degree of streptomycin resistance. The wide divergence in readings with a few of these strains might be explained as follows. Streptomycin resistance, as measured by this technique, may appear suddenly in the culture from any given patient, with the result that there is a sudden large increase in the concentration of streptomycin necessary to inhibit growth. Furthermore, during the next week or two there may be considerable fluctuations in this level. This may be explained by assuming that in such a culture there is a large population of sensitive organisms and a few relatively resistant variants which, purely by chance, may or may not be included in the sample removed from the culture for the sensitivity test.

ASSAY OF STREPTOMYCIN IN BODY FLUIDS

Blood Serum

The method adopted for routine use in estimating streptomycin in serum was based on that described by May et al. (1947). It is a capillary-tube method requiring very small amounts of serum, using a strain of Friedlander's bacillus (*Klebsiella pneumoniæ* 3) as the test organism, and a serum-glucose mixture as the indicator medium (1 part horse-serum, 1 part 10% glucose, and 2 parts distilled water, with a saturated aqueous solution of phenol red as indicator). The test is carried out as follows:

Boil 5 ml. of the indicator medium in a test-tube. Cool. Add 0·1 ml. of a 24-hour broth culture of *K. pneumoniæ* 3.

Special Articles

SPECIFIC LABORATORY TESTS IN STREPTOMYCIN THERAPY OF TUBERCULOSIS

REPORT BY THE PATHOLOGICAL SUBCOMMITTEE OF THE STREPTOMYCIN IN TUBERCULOSIS TRIALS COMMITTEE, MEDICAL RESEARCH COUNCIL.*

In the two reports of the Streptomycin in Tuberculosis Trials Committee (Medical Research Council 1948a and b) reference is made to certain laboratory tests such as the determination of the streptomycin sensitivity of tubercle bacilli and the assay of streptomycin in body fluids. No details of the methods were given, and as streptomycin is becoming more widely used in Britain it was thought desirable to describe and discuss the tests together with the results obtained, particularly in relation to the streptomycin therapy of pulmonary tuberculosis.

It is not suggested that these methods are the best or most accurate techniques, but they were devised and adopted as most suitable to the resources of the coöperating laboratories.

STREPTOMYCIN SENSITIVITY

Isolation of Organism

Sputum from cases of pulmonary tuberculosis was treated either by the acid-peroxide-iron method of Jungmann or with 4% sodium hydroxide before inoculation on to two tubes of Lowenstein-Jensen egg medium, which must be made with fresh eggs and used as freshly as possible. When sputum was unobtainable, laryngeal swabs or stomach washings were used. The centrifuged deposit of cerebrospinal fluid was cultured on Dorset-egg as well as on the Lowenstein-Jensen medium; alternatively, or in addition, some of the deposit was inoculated into guineapigs. Cultures incubated at 36–37°C were examined weekly and were not discarded until at least 8 weeks' incubation, since positive cultures sometimes developed very late from material in which the tubercle bacilli were presumably scantily present. Microscopically positive specimens of sputum obtained before or during streptomycin treatment almost invariably gave growth of tubercle bacilli on culture, and a large proportion of microscopically negative specimens also yielded growth of the organism. All strains from pulmonary cases and all but one of the strains from cases of tuberculous meningitis appeared to be of human type as judged by cultural characteristics; confirmatory tests on animals were made with several strains.

Medium

A synthetic medium containing Tween 80 and bovine albumin (Dubos and Davis 1946) was used for estimating the degree of streptomycin sensitivity. It was prepared as follows:

Potassium dihydrogen phosphate (KH_2PO_4) ..	1·0 g.
Disodium hydrogen phosphate ($Na_2HPO_4 12H_2O$) ..	6·25 g.
Sodium citrate	1·5 g.
Magnesium sulphate ($MgSO_4 7H_2O$)	0·6 g.
Dissolve one at a time in glass-distilled water.	
Add:	
Tween 80 † 10% solution	5 ml.
Casein hydrolysate ‡ 20% solution	10 ml.
Glass-distilled water to	1000 ml.

The medium should have a pH of 7·2. It was distributed in 2·5 ml. amounts in 7 ml. screw-capped bottles (bijou bottles) and autoclaved at 10 lb. pressure for 10 min. A 9% solution of bovine albumin (fraction V, Armour & Co was prepared, seitz-filtered, and 0·1 ml. added before use to each 2·5 ml. of medium, giving a final concentration of 0·3 bovine albumin when the volume in each bottle was made u to 3 ml. This Tween-albumin medium was prepared at th Central Public Health Laboratory and distributed in bul to the other centres. Later, some of the centres prepare their own medium.§ The advantage of this medium is th the tubercle bacillus grows quickly and diffusely from small inoculum. The Tween 80 has a dispersive action the ordinarily granular growth of the organism, and bovi albumin, besides promoting growth, is protective again substances that are toxic for the tubercle bacillus. Th with a young diffuse culture of tubercle bacilli, adjust to an agreed opacity, it was possible to use inocula of uniformity in the numbers of viable bacteria.

Inoculum

As soon as typical colonies of *Mycobacterium tubercula* became apparent on the egg medium, a large loopful rep sentative of the growth was emulsified in 0·5 ml. of distil water. After the grosser particles had been allowed to sett about 0·2 ml. of the suspension was transferred to a bot of the Tween-albumin medium, which was incubated about 7–10 days. If growth in this first subculture was s rather granular, 0·1–0·2 ml. was transferred to a seco bottle of medium, which was incubated for 7–10 days, wh there was usually a good diffuse growth. This culture w adjusted when necessary to a density about equal to Brow opacity tube o. 2, and 0·2 ml. of a 1 : 10 dilution was u as the inoculum. An 8-fold decrease in this inoculum h no effect on the end-point of the test, though a 4-fold incre might change the end-point by two or more tubes. Thus adjustment to standard opacity of a strain which had grown fully was not of great importance, whereas a he growth, which sometimes developed, particularly with standard strain, could be readily adjusted.

Standard Strain

A standard virulent human strain of *Myco. tubercul* H37Rv. was obtained from the Depot of Standard Cultu of Tubercle Bacilli, Saranac Lake, U.S.A., and was maintai by subculture at 3-week intervals on the surface of Proska and Beck's synthetic medium (Steenken and Gardner 19 Because of difficulties in maintaining growth on this medi the streptomycin sensitivity of a strain of H37Rv. maintai for a year on glycerol-egg medium was compared with culture on Proskauer and Beck's medium and was found be identical with it.

An inoculum of the standard strain was subcultured in the Tween-albumin medium, and a sensitivity test was up in parallel with the isolated strains.

Sensitivity Test

A small volume (0·3–0·5 ml.) of the standardised solut of 1% streptomycin ‖ was diluted 1 : 10, and from this 0·1 solution [illegible]-fold dilutions were prepared in 7 *tubes of ster* distilled water to contain 30, 15, 7·5 . . . . units per from America. Youmans and Karlson (1947) have reported a greater scatter in the range of sensitivity of strains from untreated cases than we have found (see figure). It should be noted, however, that their inoculum was apparently greater than ours, and a large inoculum is more likely to contain variants that have some natural resistance to streptomycin (Yegian and Vanderlinde 1948). Pyle (1947) has found that sputum from untreated patients may contain variants of the tubercle bacillus that resist 5–10 units of streptomycin. Yet the great uniformity in our results with pretreatment specimens indicates that the proportion of resistant variants must be very small, and that the great bulk of strains are inhibited by 1 unit or less of streptomycin.

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* The following members have served: ROBERT CRUICKSHANK, chairman (Central Public Health Laboratory); P. D'ARCY HART, secretary (National Institute for Medical Research); J. W. CLEGG and D. A. MITCHISON (Brompton Hospital); G. B. FORBES and H. D. HOLT (Central Public Health Laboratory and Colindale Hospital); I. A. B. CATHIE and J. C. W. MACFARLANE (Great Ormond Street Hospital); F. L. JACKSON and R. REES (Guy's Hospital); MARY BARBER (Hammersmith Hospital); E. NASSAU (Harefield Hospital); J. M. ALSTON and A. MOHUN (Highgate Hospital); J. N. CUMING [illegible]l, Queen Square); ISABELLA PURDIE [illegible] West Lothian); W. H. TYTLER (Sully [illegible]; G. L. MONTGOMERY (Royal Hospital for Sick Children, Glasgow); A. W. DOWNIE and A. C. T. VAUGHAN (Alder Hey Hospital, Liverpool); R. L. VOLLUM (Radcliffe Infirmary, Oxford).

† Obtainable from Messrs. Honeywill & Stein Ltd., 21, St. Jam Square, London, S.W.1.

‡ Prepared as for casein yeast agar (Mackie and McCartney 19 To 200 g. of commercial casein in a litre conical beaker add mixture of 170 ml. of concentrated hydrochloric acid w 110 ml. of distilled water. Stir quickly with a glass rod obtain a uniform suspension before the casein swells a becomes solid. Autoclave at 120°C for three-quarters of hour. Cool and add 40% sodium hydroxide till neut (about 180 ml.); cool again and filter through pulp on Buchner funnel. Dilute to 1 litre, place in a Winches quart bottle, and add 1% chloroform. Shake vigorou immediately and at intervals to emulsify the chlorofor *Store in the dark.*

§ The Tween-albumin medium is now being prepared *for distrib* tion by Dr. J. E. McCartney, Southern Group Laborato Park Hospital, Hither Green, London, S.E.13.

‖ The streptomycin used was batch no. 594 (Merck & C issued in bottles containing the equivalent of 1 g. of the pu base. Tests at the Biological [illegible] *Institute for Medical Researc* [illegible] that this preparation did not [illegible] from the Provisional British [illegible] contents of a bottle were made [illegible] and samples of this 1% solution were sent out to the laboratories from the Central Public Health Laboratory. Aft 6 months' storage at 4°C this solution, compared with a fresh prepared solution from the same batch of the powder, show no diminution in potency (fiducial limits = ±7% for P=0·05 An assay of the streptomycin contained in a series of tube Tween-albumin medium used for a sensitivity test indicat that there was no loss of potency after 14 days' incubation at 37°C.

The disadvantages of this method of testing the streptomycin sensitivity of tubercle bacilli from patients before and during treatment are (1) the delay of 6–8 weeks before the result can be reported, and (2) the assay of streptomycin-resistance on a qualitative rather than a quantitative basis.

It is important, when streptomycin is becoming more available and likely to be used much more extensively, that all strains of tubercle bacilli should be tested for their sensitivity to streptomycin before treatment is begun, so that the occurrence of fresh tuberculous infections with streptomycin-resistant or even streptomycin-dependent strains (Spendlove et al. 1948) may be detected. If possible, the test, besides being reliable, should be easily and rapidly carried out, since many small laboratories will be expected to collaborate, and clinical colleagues will want to know the result as soon as possible. The method described here is rather laborious and ill adapted to the small or overcrowded laboratory. An alternative method is to incorporate streptomycin in different concentrations in the medium used for primary isolation of the organism. Thus, American workers are using an egg medium containing 1, 10, and 100 units of streptomycin per ml. for primary culture or early subculture, and in this way they determine within broad limits the degree of resistance of the organism within 3–6 weeks (Karlson and Needham 1948, Steenken 1948).

The second objection is that resistant strains of tubercle bacilli, even when they constitute a very small proportion of the primary growth on a solid medium, will grow out when inoculated into the liquid medium containing streptomycin; hence a report of a strain resistant to 1, 10 or 100 units of streptomycin may simply mean that one variant out of several hundreds is resistant to that concentration of the drug. This would explain why some patients apparently respond to streptomycin after their infecting strain has been reported streptomycin-resistant, for in fact the bulk of the organisms may still at that stage be sensitive to streptomycin. The method of culturing sputum from patients under treatment on to plates of Herrold egg-yolk medium containing a range of streptomycin concentrations (Pyle 1947) may be used in an attempt to overcome this disadvantage, but it is not particularly suitable for a routine laboratory. The diagnostic oleic-acid-albumin-agar medium of Dubos and Middlebrook (1947), or modifications of it, may similarly be tried.

Assay of Streptomycin

Assay of streptomycin in body fluids is necessary at the commencement of an investigation with a prescribed size and rhythm of dosage in order to determine that effective levels of the drug are being obtained. When satisfactory levels have been demonstrated, routine assay of streptomycin in treated patients is not essential, and may be confined to cases where there is some evidence that the streptomycin is not being absorbed or excreted in a normal way—e.g., in patients with renal dysfunction. It has already been pointed out (Medical Research Council 1948a) that assay of streptomycin in cerebrospinal fluid, when patients are on intramuscular therapy only, may have some prognostic significance.

SUMMARY

The techniques for testing streptomycin sensitivity of tubercle bacilli and for assay of streptomycin in body fluids adopted by laboratories engaged in the Medical Research Council trials of streptomycin in tuberculosis are described and discussed.

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LEGAL COMMITTEE ON MEDICAL PARTNERSHIPS

THE report of the Legal Committee on Medical Partnerships, appointed by the Minister of Health, Mr. Aneurin Bevan, was published on Tuesday.[1] The committee, with Sir Gerald Slade as chairman, were asked to consider whether it is desirable, in order to secure an equitable result as between medical partners affected by the National Health Service Act, 1946, to amend sections 35 and 36 of the Act, either by clarification or by the extension of powers thereby conferred or in some other way.

The committee examined various types of partnership and make a series of recommendations which would require legislation to implement. Their main recommendation is that it should be declared that *nothing* in sections 35–37 of the Act shall "render unlawful the due fulfilment of obligations or due exercise of options in existing partnership agreements" existing on July 5, 1948. They propose, however, that where agreements do not expressly provide the manner in which compensation under the Act for loss of right to sell a practice is to be divided among the partners, there should in certain cases be modifications of the existing obligations and options.

Position of Partnerships.—Where all the members of a partnership have joined the National Health Service, and one member is under an obligation to sell a share of his goodwill to another, the committee recommend free transfer of that share. The partner making the transfer should then be entitled to draw immediately the State compensation payable in respect of that share in lieu of being paid the purchase price. Where some of the partners have joined the service and some have not, the committee recommend as follows:

> If a partner *not* taking part in the service is under an obligation to purchase a share from a partner *taking* part in the service, this obligation should be converted into an option. If the option were exercised, the partner in the service should take the contract price and forego his share of State compensation in respect of such share.
>
> If, on the other hand, it was a case of a partner who had *joined* the service purchasing a share in the practice from a partner who had *not* joined the service, then on paying the contract price he should be entitled to compensation out of a supplementary compensation fund which the committee propose should be set up.

Arbitration.—The committee believe their recommendations would in general enable an equitable result to be secured as between members of existing partnerships; but as the application of the principal Act and

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[1] Cmd. 7565: H.M. Stationery Office. Pp. 21. 6d.

Prepare a standard serum containing 16 units of streptomycin per ml.

Flame the surfaces of two waxed slides divided into 10 compartments, and place nine separate volumes of sterile physiological saline solution in positions 2, 3, 4, 5, 6, 7, 8, 9, and 10 on the slides. Place one volume of the test serum ¶ in position 1, and add one volume of serum to the saline in position 2. Mix, and transfer one volume to the saline in position 3, and so on. After mixing in position 9, discard one volume so that 10 can be used as a control. Add one volume of indicator medium to the serum in position 1, to the serum dilutions, and to the saline control. Repeat this technique with the standard serum. The final dilutions of the test serum are thus 1/2 . . . 1/512, and the final concentrations of streptomycin in the dilutions of standard serum 8, 4, 2, 1, 0·5, 0·25, 0·125, 0·06, 0·03, 0.

Draw up the mixture of serum dilution and indicator system into capillary tubes. Place the tubes horizontally in 'Plasticine,' leaving the ends unsealed. Incubate at 37°C for 24 hours.

Where full growth of the test organism has occurred the column of fluid in the capillary tube shows opaque clotted serum coloured uniformly yellow; where no growth has occurred the fluid remains red and transparent. The highest dilution showing no growth is taken as the end-point.

The reading obtained in the test serum is compared with that in the standard serum, and the concentration of streptomycin in the test serum is calculated from the formula $\frac{\text{T.E.}}{\text{S.E.}} \times 16$, where T.E. is the reciprocal of the test-serum end-point and S.E. the reciprocal of the standard-serum end-point—e.g.:

$$\text{T.E.} = 16 \qquad \text{S.E.} = 64$$

$$\frac{16}{64} \times 16 = 4$$

Therefore the unknown serum contains 4 units of streptomycin per ml.

An alternative and more accurate method (Mitchison and Spicer 1949), based on the agar-diffusion method of Stebbins and Robinson (1945), was used throughout at Brompton Hospital and for the most part at Harefield Hospital.

As intramuscular injections of streptomycin were given at 6-hourly intervals, it was agreed to test specimens of blood-serum at 1, 3, and 6 hours after the standard dose of 0·5 g. The results from the three main pulmonary tuberculosis centres are summarised in the accompanying table. Since assays were being made on cases in the Brompton Hospital at shorter intervals than 1, 3, and 6 hours, the readings nearest 1, 3, and 6 hours were taken for comparison with the results obtained at Colindale and Harefield Hospital. The maximum and minimum levels recorded from these three centres at 1, 3, and 6 hours were respectively 42, 32, and 24 units, and 5·6, 4·0, and 1·0 units. There was thus a wide range of values, which was sometimes demonstrable in repeat tests on the same patient. These variations are probably due as much to technical difficulties with the methods of assay as to variations in the absorption and excretio of streptomycin by different persons or in the sam person at different times. The average results indicat that the level of streptomycin in the blood for th 6-hour period after injection of 0·5 g. is sufficient to hav an inhibitory effect on the growth of strept sensitive tubercle bacilli, provided streptomycin getting ready access to the bacilli in the infected tissu

COMPARISON OF STREPTOMYCIN LEVELS (UNITS PER ML.) IN BLOOD-SERUM AT THREE CENTRES

Centre	No. of cases	No. of tests	Average streptomycin levels at		
			1 hour	3 hours	6 hours
Brompton . .	11	18	22·2	14·9*	8·7
Colindale . .	11	32	19·4	14·3	6·6
Harefield . .	14	19	20·9	14·2	8·5

* Some observations included in this average level at 3 hours were made at 2 or $2^1/_2$ hours after the injection.

The agar-diffusion method of assay was used at Brompton and Harefield Hospitals; and the capillary dilution method was used at the Central Public Health Laboratory, Colindale.

Urine

Serial 2-fold dilutions of urine and of a solution streptomycin (1000 or 2000 units per ml.) were made nutrient broth; the range of dilutions depende on t anticipated level of streptomycin in the urine, based the calculation that 50–70% of streptomycin is excret in the urine within 24 hours of parenteral injecti The dilutions of urine and of streptomycin solution w inoculated with a standard inoculum of *Staphylococ aureus* Oxford (0·02 ml. of a 1/100 dilution of a 24-h broth-culture) and incubated at 37°C for 24 hours. T highest dilutions which completely inhibited grow as indicated by absence of turbidity, was taken as end-point, and the level of streptomycin was calcula from the formula $\frac{\text{U.E.}}{\text{S.E.}} \times 1000$, where U.E. is t reciprocal of the urine end-point, and S.E. the recipro of the streptomycin end-point. When the urine bacterially contaminated, the test sample was first hea at 60°C for one hour. The urine must not be sterili by seitz filtration, which removes a considerable amo of streptomycin.

Assay of streptomycin excreted in 24-hour urine 9 patients with pulmonary tuberculosis given strep mycin 0·5 g. 6-hourly was made by the test-tube dilut method described above and gave levels of 500–1 units per ml.

Cerebrospinal Fluid

Assay of streptomycin in cerebrospinal fluid may made by the capillary-tube method or by a test-t dilution method using a standard medium of 1% 'L Lemco' (pH 7·5) containing 1% glucose. The res obtained in tuberculous meningitis have already b described (Medical Research Council 1948a). The ag diffusion method may also be used for assay of strep mycin in cerebrospinal fluid or urine.

DISCUSSION

Sensitivity Tests

The remarkable uniformity in the results reported fro different centres of the sensitivity tests of strains tubercle bacilli isolated from tuberculous patients bef treatment with streptomycin suggests that the meth adopted will give comparable results in the hands different workers. This view is confirmed by the resu of retesting a large number of strains at one referen laboratory, where the regional findings were usua corroborated.

The uniformity of results is, we believe, attributa in large part to the use of the new Tween-albumin liqu medium, which encourages diffuse growth of the tuber bacillus and so allows the use of inocula of some u formity. This medium has, however, been recent criticised by Fisher (1948a), who found that in 20 patien treated with streptomycin for 20 weeks resistant strai were demonstrable in only 5 cases when the strains we tested in a medium containing Tween 80, whereas Youmans's medium, which contains no Tween 80, of the strains were resistant. Using 3 resistant strai of tubercle bacilli, Fisher (1948b) later reported that t addition of Tween 80 or of glycerol had apparently antagonistic effect on the organism and so increas the sensitivity of the test strains. This phenomen was partly reversed by the addition of bovine albumi or plasma. The medium used in our investigatio contained 0·3% instead of 0·2% bovine albumi and casein hydrolysate instead of asparagin as i Fisher's medium, and seemed to be satisfactory fo demonstrating the *emergence* of streptomycin resistan strains.

Certainly the proportion of resistant strains whic developed during streptomycin therapy in our series cases has been at least as high as in any series reported

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¶ Sufficient serum is obtained by collecting blood from ear prick or finger prick into a Widal tube. It has been usual to inactivate the serum by heating at 56°C for 30 min., but this may be unnecessary with the test organism *K. pneumoniæ* 3.

In England Now

A Running Commentary by Peripatetic Correspondents

Now that air transport has brought the Colonial Empire within hours or days of London, specialists in every branch of medicine and surgery will soon be bringing to the backwoods and outposts the latest advances of the research laboratory and the newest techniques of the operating-theatre. After reading the Students' Guide one wonders how soon the specialist medical-student selector will be coming to give us a summary of the intel'igence and a forecast of the future of the applicants for training in our embryo training schools. Perhaps he would advise us whether to accept or reject the candidate living a hundred miles away who writes thus:

> Dear Sir,—As I have heard how famous your hospital is, I very much desire to apply a vacancy in it, to be trained as an assistant. The reason why is that if I shall not get anough points to go to a High School I shall want to be as you see above there. Very politely and without adoring myself I may tell you that I am a keen boy. I am in Form II now waiting to sit the Preliminary Examination in November, Sir. I should be very glad if you will allow me, as I am very interested in it. As I am in a discomposure I am going to conclude my letter, which I have written so abbreviately that I can't write more for the time being.—With much comity, I remain, Sir, Yours faithfully, . . .

* * *

Last week I took time off to assume the rôle of Dr. *Peripatêkos* for an afternoon and wandered round the Royal Horticultural Society's hall where the London Medical Exhibition was being held. It was worth while, for I learned a bit, met many old friends not seen in years, and found plenty of material for speculation. The gentlemen on the stands—"reps" they are called in the trade—were most informative, and several soared way over my head into a chemical firmament where I could not follow. The structural formulæ of œstrogens and anti-histamine substances rouse no response in me. Ironically, however, the new ethinyl œstradiol sounded interesting. Procaine penicillin looked a nice preparation and an obvious advance on the oil-wax suspension. Aminosalicylic acid, a newcomer of promise in the tuberculosis field, was on exhibition; but the company was not releasing it yet except for carefully controlled trial—a very sensible policy I thought. There was a fascinating plastic gadget for giving penicillin-dust inhalations which appeared ingenious and efficient. (In a recent American journal I saw a reference to the use of this apparatus for administering adrenaline analogues as a dust in asthma.) Among the instruments the new heart-sound amplifiér caught my eye as a useful adjunct for teaching and research as well as a diagnostic aid. This little list is of course, a personal one; a colleague would probably have come up with quite a different set of notabilia. I brought away a mass of commercial literature which (strangely enough, some might say) shall be kept. I find it useful, for it summarises a lot of journal reading I never have time to do anyway. Naturally it is partisan, but I make allowances for that, and anyway the Simon-pure scientific report is often enough pretty partisan in its presentation of the author's pet theory. But most of the firms seem to me to have a lot to learn about the production of commercial literature.

There seems to be a satisfying number of firms doing high-grade. research. The new developments in both pharmaceutics and instruments should be not only useful in the therapeutic field but valuable assets in the export markets. This effort appears all the more meritorious when one considers the burden of taxation on research (which I believe is proportionately much less in America), the scarcity of highly skilled men, and the immense difficulty of getting new scientific instruments; for many of these a delay in delivery of one to two years is, I am told, quite usual. Here and there among the reps one found the odd line-shooter. A few firms were wrapping up the mixture as before by turning out the well-established favourites in slight disguise. Then the multiplicity of names for the same product exasperates; the new ethinyl œstradiol already has four proprietary names. It is time that this Babel of nomenclature was knocked down; but how this is to be done is another matter.

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My patient, Mr. Thingummyjig,*
Wears a fairly inobvious wig.
He wasn't seeing as well as he might,
But a pair of spectacles put that right.
Deaf as an adder, he makes the grade
Now that he has a hearing-aid.
After the usual grim adventures
His teeth were drawn and he now wears dentures.
His chest and guts were, of course, X-rayed
But all in vain; the films betrayed
No gastric or duodenal lesion,
Not so much as a mere adhesion.
Enteroptotic and far from svelte,
He had to have an abdominal belt;
And his hernia caused a fearful fuss
Till caught and controlled by an adequate truss.
Till cased in a silk-elastic stocking
His varicose veins ached something shocking.
Time marches on and as on it marches
He'll need supports for his fallen arches.
And it won't be long till he asks, I feel,
For a bag to carry his hydrocele.

Some may consider that Mr. T.
Is less of a man than a Christmas-tree.
But thanks to being an O.A.P.
To the dentist, to Mr. Bevan and me,†
All shall be added unto him—free.

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of any amending Act might in certain cases produce special hardships which it is not possible to foresee, they propose arbitration machinery for dealing with such hardships if they arise. Such cases should either be referred (where the parties agree) to a single arbitrator to be nominated by, or on behalf of, the partners; or, failing agreement, to a committee of arbitration consisting of a legal chairman, a qualified accountant, and a medical practitioner. The first two members would be nominated by the Minister of Health and the third by the president of the British Medical Association.

The report makes a detailed study of difficulties which might possibly arise in relation to partnership agreements.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

THE 174th session opened last Tuesday. Owing to indisposition, Sir HERBERT EASON was prevented from giving his presidential address, which was read by Prof. Sydney Smith, who, under section 9 of the Medical Act, 1858, had been chosen by the members present to act as president. In his address Sir Herbert expressed regret at the death of Sir George Newman, a former treasurer of the council and chairman of the public-health committee; and of Prof. J. K. Jamieson, who represented the University of Leeds from 1928 to 1936. Mr. J. C. Flood has resigned from the council and has been succeeded, as representative of the Apothecaries' Hall of Ireland, by Mr. J. J. O'Donnell.

Applications for registration under the Medical Practitioners and Pharmacists Act, 1947, now number just over 1600, and nearly 1050 applicants have been registered under the Act. The primary business of settling the position of practitioners who were temporarily registered during the emergency by virtue of Defence Regulation 32B has been substantially completed. Of just under 1100 applicants in this category nearly 950 have been registered under sections 1 and 2, on the receipt by the council of evidence of satisfactory service in a medical capacity while they were temporarily registered. Nearly 300 applications have been made by practitioners who were temporarily registered by virtue of section 5 of the Polish Resettlement Act, 1947. The number of applications under section 3, which relates primarily to persons who after Sept. 1, 1939, served in a medical capacity outside the United Kingdom in any of H.M. Forces, and also to persons whose war service in other circumstances was considered by Parliament equally deserving of consideration, is just under 140. There have been 95 applications under section 4, which relates to persons not within the scope of sections 2 and 3 who before Aug. 4, 1947, have been permitted to enter, or to remain in, the United Kingdom in view of circumstances attributable to war, and to certain other persons falling within provisions of section 5 of the Polish Resettlement Act, 1947. The number of applications lapsed, withdrawn, or refused as not being in conformity with the statutory conditions is 36; and after deduction of this number about 500 applications remain under consideration.

The penal cases committee have been concerned in the last year or two to note the number of cases reported to the council of convictions of practitioners for infractions of the Dangerous Drugs Acts and Regulations. While the council draw a distinction between the purveying of drugs by practitioners to addicts, and self-addiction, they feel that members of the profession should realise—to quote the words of a memorandum issued by the Home Office this year—that "in a number of cases doctors who had purchased drugs for the gratification of their own addiction have been convicted of the offences of unlawfully procuring and possessing these drugs." It is therefore clear that the self-administration of dangerous drugs for the gratification of addiction is not one of the necessities for practice for which alone practitioners are authorised to possess and supply such drugs; and the council feel it right to issue a warning that self-addiction on the part of practitioners may be considered as a grave lapse from the proper standards of professional conduct.

The draft Bill for the amendment of the Medical Acts which the council have submitted to the Government was not mentioned in the King's Speech at the opening of the present session of Parliament; but it may perhaps find a place among the other measures which will be laid before Parliament during the session if time permits.

Medicine and the Law

Nature of Statutory Adoption

AN unhappy experience of child adoption came befor a Scottish court earlier this year. A married pair adopte a three-months-old boy after the adoption society ha made the usual inquiries and reports which the statutor regulations prescribe. The health report stated that h had been medically examined and was fit and healthy. Presently, when it was found that he was not exhibitin normal development, another medical examinatio indicated that he was, and would always remain, mentall defective, owing apparently to a severe brain injur sustained at birth. The adopting couple then asked th court to cancel the adoption order, contending that i had been applied for in error induced by the informatio coming from persons acting on behalf of the boy mother. What Scots lawyers call error *in essentialib* might justify rescission of an agreement based o innocent misrepresentation if the mistake means th there has been a complete difference in substance betwee what was supposed to be supplied and what was in fa received. The Court of Session, however, refused to loo upon the transaction as if it were a contract at al Adoption under the statute, said the court, was a matt of status; it did not fit into the ordinary categories which forms of action are assigned. It was not possibl since the statute made no provision for cancelling a adoption order, thus to invert the status of the child the child had no part in the transaction.

It will be remembered that the Act of 1939 forbids th adopter to apply to the court for an adoption order unt the end of a period of three months from the date o which the child is delivered into the care and possessio of the adopter. During that period the adopter may notify the society of his or her intention not to adopt the child—in which case the child must be returned to the society within seven days. If no such notice has bee given in the three-month period, the adopter must withi another three months either apply to the court for a adoption order or notify the society of his or her intentio not to apply for one. As for the information given by t society about the health of a child, the particulars about which the society must inquire and report include 2 questions, forming a medical report which must b signed by a duly qualified medical practitioner. Tw of these questions ask whether the child's mental and physical development, and its behaviour, speech, and articulation, are normal for its age. It is hard to see what further precautions could be prescribed.

Explosion of Anæsthetic Machine

The Southend coroner has lately inquired into the case of a patient who died after an explosion had wrecked the apparatus from which he was being given a general anæsthetic. The anæsthetist gave evidence of having seen a flash at the side of the breathing-bag; the machine itself was wrecked and the connexions near the patient's face were blown apart. He suggested that ignition was due to a static electric spark. The patient died some five hours after the operation was completed, from massive collapse of the lungs as the result of pulmonary shock. The manufacturers said that, having reconstructed the machine, they found a leak between the breathing-bag and the bag joint. A verdict of death by misadventure was recorded.

In England Now

A Running Commentary by Peripatetic Correspondents

Now that air transport has brought the Colonial Empire within hours or days of London, specialists in every branch of medicine and surgery will soon be bringing to the backwoods and outposts the latest advances of the research laboratory and the newest techniques of the operating-theatre. After reading the Students' Guide one wonders how soon the specialist medical-student selector will be coming to give us a summary of the intelligence and a forecast of the future of the applicants for training in our embryo training schools. Perhaps he would advise us whether to accept or reject the candidate living a hundred miles away who writes thus:

Dear Sir,—As I have heard how famous your hospital is, I very much desire to apply a vacancy in it, to be trained as an assistant. The reason why is that if I shall not get anough points to go to a High School I shall want to be as you see above there. Very politely and without adoring myself I may tell you that I am a keen boy. I am in Form II now waiting to sit the Preliminary Examination in November, Sir. I should be very glad if you will allow me, as I am very interested in it. As I am in a discomposure I am going to conclude my letter, which I have written so abbreviately that I can't write more for the time being.—With much comity, I remain, Sir, Yours faithfully, . . .

* * *

Last week I took time off to assume the rôle of Dr. *Peripatêkos* for an afternoon and wandered round the Royal Horticultural Society's hall where the London Medical Exhibition was being held. It was worth while, for I learned a bit, met many old friends not seen in years, and found plenty of material for speculation. The gentlemen on the stands—"reps" they are called in the trade—were most informative, and several soared way over my head into a chemical firmament where I could not follow. The structural formulæ of œstrogens and anti-histamine substances rouse no response in me. Ironically, however, the new ethinyl œstradiol sounded interesting. Procaine penicillin looked a nice preparation and an obvious advance on the oil-wax suspension. P-Aminosalicylic acid, a newcomer of promise in the tuberculosis field, was on exhibition; but the company are not releasing it yet except for carefully controlled trial—a very sensible policy I thought. There was a fascinating plastic gadget for giving penicillin-dust inhalations which appeared ingenious and efficient. (In a recent American journal I saw a reference to the use of this apparatus for administering adrenaline analogues as a dust in asthma.) Among the instruments the new heart-sound amplifier caught my eye as a useful adjunct for teaching and research as well as a diagnostic aid. This little list is of course, a personal one; a colleague would probably have come up with quite a different set of notabilia. I brought away a mass of commercial literature which (strangely enough, some might say) shall be kept. I find it useful, for it summarises a lot of journal reading I never have time to do anyway. Naturally it is partisan, but I make allowances for that, and anyway the Simon-pure scientific report is often enough pretty partisan in its presentation of the author's pet theory. But most of the firms seem to me to have a lot to learn about the production of commercial literature.

There seems to be a satisfying number of firms doing high-grade research. The new developments in both pharmaceutics and instruments should be not only useful in the therapeutic field but valuable assets in the export markets. This effort appears all the more meritorious when one considers the burden of taxation on research (which I believe is proportionately much less in America), the scarcity of highly skilled men, and the immense difficulty of getting new scientific instruments; for many of these a delay in delivery of one to two years is, I am told, quite usual. Here and there among the reps one found the odd line-shooter. A few firms were wrapping up the mixture as before by turning out the well-established favourites in slight disguise. Then the multiplicity of names for the same product exasperates; the new ethinyl œstradiol already has four proprietary names. It is time that this Babel of nomenclature was knocked down; but how this is to be done is another matter.

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Letters to the Editor

CHRISTMAS GIFTS

SIR,—At Christmas, 1947, each of our regular beneficiaries received a Christmas gift of £5 from the Royal Medical Benevolent Fund, and these gifts gave great pleasure and help to all. Christmas, 1948, is now near at hand, but the response to my appeal made in October has not yet reached the sum required. I feel sure that no-one would want the amount of the gift to be reduced, and therefore I beg those of your readers who have not sent a contribution to do so as soon as possible. Contributions should be marked "Christmas Gift" and sent to: Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15. They will be gratefully acknowledged.

WEBB-JOHNSON
President, Royal Medical Benevolent Fund.

HOSPITAL MANNERS

SIR,—Though the correspondent writing on Two Hospitals in your issue of Nov. 13 seems to have been singularly unfortunate in the choice of her first hospital, there is certainly an element of truth in her criticisms, many of which are entirely due to the lack of the necessary staff and equipment. Our hospitals have been handicapped in their progress for the patient's comfort by two world wars. It is devastating to compare our wards and their equipment with those of countries such as Sweden and Switzerland.

I would agree as to noise and the lack of privacy. I have striven to obtain a quiet atmosphere and small wards for my patients for over twenty years. I have not been frustrated in my efforts by my board of management at any time, but merely by lack of money, and in recent years complete inability to provide cork and rubber floors, smooth running wheels on trolleys, &c., &c. But I am confident that I have provided a happy, friendly, and sympathetic nursing staff to whom the patient is of paramount importance.

Now I am glad I am near the age of retirement. Quite soon, good nurses will be a thing of the past. The constant adverse criticism of the matron and ward sisters, the large percentage of whom are wise and kindly administrators, with a few difficult ones thrown in as in all other professions and walks of life, will drive out all the senior members and prevent new recruits coming in. The modern student nurse will disappear. At present she is a happy young woman, has an eight-hour day, and is keen on her work. Most hospitals provide a comfortable home for her, with only those rules and discipline imposed such as she would observe in her parents' house, and a firm, but wise and kind control of her actions on the sick wards, this being part of her education, to ensure that she will eventually develop into a nurse able to meet the demands of the sick person in her charge, and to ensure that she will be a capable and responsible woman able to deal with matters pertaining to the recovery of the patient, and who if she is not disciplined and efficient may cause the death of a patient.

How long will these young students come forward when responsible people like Lord Crook in the House of Lords accuse the matron or ward sisters of the hospitals of tyrannising over the nurses? I venture to think that Lord Crook would be the first to complain were he unfortunate enough to have a serious illness, and his nurses were not calm, efficient, and disciplined.

Recruitment is being seriously affected by this idle ill-informed chatter about those in authority in hospitals. Every week as I interview prospective candidates, 99% tell me: "Of course, everyone tries to persuade me that I am crazy to think of nursing, it is a hard and irksome profession, and my father is very upset that I have chosen it." At present, I thank God that there are strong-minded girls who will not be put off by their fathers, and those others who know nothing of the real joy of our work and who care nothing for the service to mankind which our nurses desire to render. The general public and the fathers are the first to cry for nurses when ill, and the first to grudge the nurse a day off if she happens to be nursing them.

Let us have some support and encouragement in our work, so that we shall be able to improve conditions for our patients, so that there may be no element of truth in complaints such as registered by your correspondent of Nov. 13. I would like to reply to her criticisms one by one, only a few of which I think are applicable to my own hospital, but I feel you will not allow me the space in your journal.

I would only add that I see "the writing on the wall," and unless we are given more credit and help for the work which we are striving to do against heavy odds, soon there will be no efficient nurses to do even the bare essentials for the patients, not to mention all the improvements which hospital routine so badly needs.

University College Hospital,
London, W.C.1.

E. O. JACKSON
Matron.

SIR,—The article on Two Hospitals, and your editorial, should be read by all hospital workers. Maybe none of us can fully appreciate the patient's position until we too have been patients, but we can try to do so. I have recently tried to find out patients' views by follow-up letters, but these are notoriously unreliable. Many patients are averse to writing and complaining, and I had to send 195 letters to get 100 replies. Other methods such as sitting incognito among the outpatients and talking to visitors in the bus queue yielded some useful suggestions.

These problems are not confined to our own hospitals. Here is a notice I came across on the wall of an office in an American hospital:

> Hotels have accumulated fortunes by astutely commercialising the biblical injunction "A soft answer turneth away wrath." Hospitals have not yet learned this lesson.
>
> Daily contact makes it easy to forget that a body diseased often means a body disordered. Many patients suffer from anxiety. Some are actually in danger and know that death is within the range of probability; pain and distress are usually accompanying features. Surely such patients find small comfort in the coldness and indifference often encountered in places that claim to be organised for the purpose of promoting health and consequently happiness. These remarks apply with double force to a child snatched from the arms of a loving mother and placed in a hospital ward with not a familiar face in sight. Hospital attendants are seldom positively cruel. Many often exhibit this tendency in a negative sense expressed by inattention.
>
> Physicians and nurses particularly should adopt the hotel plan of service and incidentally comprehend the fact that hospitals were organised primarily for the treatment of sick persons and not to provide places for the staff.
>
> Hospital attendants should maintain an inexhaustible supply of kindness, consideration and forbearance, especially the latter, ready for instant use.
>
> An aptitude for debate or a natural or cultivated taste for recrimination have no place in the armamentarium of a doctor or nurse.
>
> A mind small enough to interpret as a personal affront the peevish or unreasonable complaint of a sick individual means that its possessor is totally unfit to practice the healing art or care for those distressed in mind or body.

Chase Farm Hospital, Enfield.

C. ALLAN BIRCH.

SIR,—I write to you as a recent patient in two London hospitals. In the first I was in a large ward, and I noticed the discomfort suffered by patients through not being told of their condition, their progress towards recovery, and the kind of treatment being used, or proposed to be used. As your correspondent says, "They don't tell you anything."

I was photographed with X rays and could not obtain from doctor, sister, or nurse any information at all of the condition shown by the photograph. The teaching specialist hardly ever said a word to me or listened to my remarks or questions. I did, after some weeks' delay, get my regular visiting doctor to listen to me and explain to some extent the treatment I was receiving and the progress of my disease: but he always treated me as a person not really to be considered in the matter.

Though nurses were always ready and willing to do—as quickly and efficiently as conditions allowed—anything a patient required, they had always to be asked.

No nurse, in my 14 weeks in two hospitals, ever asked me if she could do anything for me, or if I needed anything: and there are people who do not like to ask overworked women to do anything. On the other hand, I shall never forget the kind and sympathetic help and attention received from all the nurses who ministered to my needs in my weakness.

What is needed to produce perfect service in hospitals (apart from human sympathetic care which is there in abundance) is more doctors and nurses, and more mechanical appliances. A patient under present conditions soon finds out that the doctors and nurses are too few to provide that personal individual care which would be the ideal condition to achieve rapid healing. They now have not the time to get acquainted with the varying needs of patients, and their different ailments and dispositions.

London, W.C.2. B. W. YOUNG.

SIR,—I am at the moment attending as an outpatient at one of the London teaching hospitals. A deep-rooted aversion to hospitals made me apprehensive for days before I first went.

The appointment clerk gave me a friendly smile and told me to go and sit down, but I was so nervous that I could not turn the pages of a book. A doctor then came up and asked whether he could do anything, and on receiving a negative reply he stayed and talked to me for a minute, putting me at my ease. I then went into the surgery and sat down and waited, noting with some surprise that this seemed to be a combined consulting and waiting room, the patient only going behind a screen for examination. I was lucky; there was nobody else waiting and no students. The doctor was charming; considering there was practically nothing the matter with me he could not have been more sympathetic. Going back the next day I was surprised that my records were given to me to hold, and I studied them with interest. The doctor seemed to have mislaid his pleasant manner, and appeared to be showing off to the two students now present. However, he passed me on to the orthopædic department, and the appointment clerk whom I now saw treated me as if my convenience was of far more importance than the time of the hospital staff. Here again the waiting and consulting room were combined—an arrangement which I consider extremely bad.

Lastly I was referred to the physiotherapy department. Here again the good manners of doctors, nurses; physiotherapists, and the student who took my case-history, were all very much appreciated and did more than I can say to overcome my horror of hospitals.

AN OUTPATIENT.

SIR,—Some while ago I was sent with a note from my doctor to the outpatients' department of a London hospital—he wanted me to have an X ray for a suspected bone injury.

I duly presented the note, and listened to an argument between two clerks as to whether my case was medical or surgical. They apparently decided on the former, and I was made to wait four hours in a draughty corridor with lavatories on one side and on the other cubicles and a sort of dressing-station. When the four hours were up I expostulated with a sister (who was extremely kind and most apologetic: she was the only one who showed the slightest concern for the outpatients), saying I had to get back to my work. I was then taken in to see the house-physician, who for some minutes sat grandly at his desk ignoring me and reading whatever was written on my card and in my doctor's note. Irritatedly I said that I thought I had come for an X ray only. He seemed astounded that I should speak at all, and made some remark to the effect that "the patients were doing the diagnosing now!" After a few questions I was told to disrobe and waited another ten minutes in a room—the before-mentioned dressing-station—covered with a blanket on which there was a large and recent bloodstain. The physician then came back and proceeded to do the usual chest-thumping and knee-tapping. Finally I was allowed to go and have the X ray, which was what I had come for and which took exactly seven minutes. Was it necessary to waste my time and the doctor's and nurses' with a medical examination which could have been done beforehand by my own doctor if necessary?

I was instructed to come again in a few days and see the surgeon. On that occasion I waited five hours among a packed crowd of others, some of whom no doubt waited longer than I. Why could it not be arranged for people to come at, say, half-hourly intervals, so as to avoid part, at least, of this endless waiting?

UNDER TREATMENT.

SIR,—Your leading article of Nov. 13 put me in mind of a story which I heard as a student in Edinburgh many years ago and have never forgotten. It refers to an earlier age when Latin was more freely spoken among doctors than it is now. A certain lecturer concluded a bedside dissertation to his class with the words "Fiat experimentum in corpore vilo"; to which the patient quietly replied, "Pro hoc corpore vilo Jesus Christus mortuus est"—a rebuke which might well be borne in mind by the present generation of teachers and housemen.

London, W.1. W. A. LETHEM.

SIR,—Your correspondent's article in the issue of Nov. 13 should be a salutary reminder to the medical profession of our neglect of Hippocratic wisdom in this scientific age.

> "Life is short, the art is long, opportunity is fleeting, judgment is difficult, and experience is fallacious. It is the duty of the physician not only to do that which immediately behoves him, but to secure the coöperation of the patient, of those in attendance, and all external agents."

The first part of Hippocrates's first aphorism is well known, but the second part might be practised more often. In appreciation of my old teacher, Russell Howard, who stressed the value of the Hippocratic lore, I sign myself

OLD LONDONER.

ACCIDENTAL INTRA-ARTERIAL INJECTION OF DRUGS

SIR,—Since the recent excellent article on this subject by Mr. Cohen[1] did not refer to accidental intra-arterial administration of soluble thiopentone mixed with curare, the following case is of interest.

A fit man, aged 45, thought to have a carcinoma of the colon, was brought to theatre for laparotomy. A solution of 15 ml. of 5% soluble thiopentone was mixed with 1·5 ml. of the Duncan Flockhart preparation of *d*-tubocurarine chloride, containing 15 mg. The median basilic vein of the right arm was chosen. After a little difficulty in venepuncture was overcome, what appeared to be venous blood was withdrawn into the syringe and slow injection was begun. The patient, asked whether the injection caused any discomfort, said it did not.

When 6·5 ml. of the mixture had been given, about ten seconds after the start of the injection, he complained of intense pain in the forearm and hand, and he screwed up his face with pain. He likened the sensation to that of an electric shock to the arm. The needle was at once withdrawn, 10 ml. of soluble thiopentone was injected into another vein, and anæsthesia was maintained with cyclopropane and oxygen. Almost coincident with the complaint of pain, the whole forearm and hand became intensely flushed. The radial pulse appeared equal on both sides.

Anterior brachial-plexus block was performed, after an interval of ten minutes, with 40 ml. of 2% procaine without adrenaline. The blood-pressure was then 90/40 mm. Hg. During laparotomy the arm was kept extended on a pillow, and the patient was returned to the ward with the arm in this position, with instructions for skin temperatures of both forearms to be taken every quarter of an hour. The readings obtained showed little variation.

Palpation of the antecubital fossa showed that the brachial artery ran a superficial course and lay immediately beneath the median basilic vein.

Convalescence was uneventful, no further complaint of pain in the arm was made, and there was no sign of thrombosis in the vessels of the forearm.

Comroe and Dripps,[2] in their experimental work on the intra-arterial injection of tubocurarine in man.

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1. Cohen, S. M. *Lancet*, Sept. 4, p. 361.
2. Comroe, J. H. jun., Dripps, R. D. *Anesthesiology*, 1946, 7, 260.

reported the production of huge weals and flares, which they thought were due to a histamine-like action of curare. In the present case the tubocurarine may have reduced or antagonised the spasm-producing properties of the thiopentone.

I wish to thank Dr. P. M. Edwards, senior anæsthetist to the West Middlesex County Hospital, for her help and advice.

Isleworth, Middlesex. F. R. RUSSELL.

GASTRIC ACIDITY

SIR,—The concentration of acid in the gastric contents, as determined by a fractional test-meal, is usually greater in patients with duodenal ulcer than in patients with gastric ulcer or normal subjects. The following factors operating singly or together might account for the increased concentration of acid:

1. *Supranormal rate of emptying.*—In patients with duodenal ulcer emptying is often hurried after a radiopaque meal, and the emptying-time of a gruel fractional test-meal is shortened. The gastric secretions are correspondingly diluted by a smaller proportion of test-meal.

2. *Supranormal volume of gastric juice.*—The volume secreted during a test-meal has not so far been measured, but it is known that patients with duodenal ulcer tend to secrete larger volumes in response to histamine and insulin than do normal subjects.[1]

3. *Supranormal concentration of acid.*—No reliable measurements of the concentration of acid in the juice secreted during a meal have yet been made, but the concentration in the juice of patients with duodenal ulcer after the injection of histamine or insulin is probably representative of the juice secreted during a meal. Such secretion is generally believed to have a supranormal concentration of acid in patients with duodenal ulcer. For example, Hollander[2] wrote: "Concentration of acid and pepsin in *gastric juice* [my italics] . . . the range for gastric ulcer coincides with that for normal individuals, whereas for duodenal ulcer it reaches a distinctly higher limit. Correspondingly, the average also is greater in duodenal ulcer patients."

Ihre,[1] however, concluded that the concentration of acid in the gastric juice of patients with duodenal ulcer was lower than that in normal subjects. He stimulated secretion first with histamine and then with insulin, avoiding contamination by continuous aspiration of the duodenal contents. He collected gastric juice from 24 normal subjects (mean age 23), from 20 patients with gastric ulcer (mean age 45), and from 20 patients with duodenal ulcer (mean age 41). The mean concentrations of acid and their standard errors, computed from Ihre's results for each group, are shown in the accompanying table. The mean concentration of acid in the juice of normal subjects is 35 milli-equivalents per litre greater than that in patients with duodenal ulcer, and 41 milli-equivalents greater than that in patients with gastric ulcer.

MEAN CONCENTRATION OF ACID IN THE GASTRIC JUICE [MILLI-EQUIVALENTS/l (CLINICAL UNITS)]

—	Patients		Normal subjects		
	Gastric ulcer	Duodenal ulcer	Ihre	Bloomfield and Keefer	
Mean age ..	45	41	23	20	40
Mean conc. of acid	81·5	87 6	122 8	75	64
Standard error of mean	±4·7	±5 4	±1·8	..	..

Although these differences are statistically very significant they do not warrant the conclusion that peptic ulcer is associated with a gastric acidity lower than that of normal subjects, since the mean age of the normal subjects is 20 years less than that of the patients with peptic ulcer. Bloomfield and Keefer[3] found in mixed group of hospital patients that the mean acidi of gastric secretions after the injection of histami declined with age. To show the importance of age, t mean acidity in such a group aged between 15 and 2 and in another group between 35 and 45 from Bloomfie and Keefer's material, have been included in the tabl Probably because they were examining hospital patient Bloomfield and Keefer recorded a much lower me acidity for the group with a mean age of 20 than d Ihre. The difference between the group with a me age of 20 and the group with a mean age of 40 was milli-equivalents per litre. This is one-third of t difference between Ihre's normal subjects and h patients with duodenal ulcer. Thus probably a gro of normal subjects, aged 40, examined by Ihre's techniqu would show a mean acidity higher than that show by his patients with duodenal ulcer. This is contra to general impression. Detailed examination of Ihre figures suggests that this reduced acidity in patients wi peptic ulcer is due to an increase in the proportion non-acid fraction of the gastric secretion.

Thus it seems that the increased concentration of aci in the gastric contents of patients with duodenal ulc results from rapid emptying and an increased volu of secretion; it is not caused by the secretion of gastric juice containing acid in concentration high than normal.

I am indebted to Dr. Ihre for permission to use his figure

Guy's Hospital Medical School,
London, S.E.1. J. N. HUNT.

GROUP MEDICAL PRACTICE

SIR,—The writers of the report in your issue of Nov. are, I think, not doing justice to the idea by maki sweeping statements based upon experience of only t years. The comment by "Consultant" on Nov. 13 sound. I would like to emphasise that however valuab group medical practice may be in an association general practitioners, there are disadvantages when th group coöperation is translated into their speciali services in a neighbouring small hospital. The difficul is graphically illustrated by the example they gi of the group's coöperation and organisation. While five partners in the group were intimately concerned the hazards of a major general surgical operation, a area of approximately 80 square miles with a populatio of 25,000 was deprived of five-sevenths of its general practitioner service; and that is the real trouble a small group working under the conditions describe for the conscience of the specialist cannot be square with the conscience of the general practitioner.

Group general-practitioner-specialist services are st necessary in very remote parts of this country, but these circumstances it is to be hoped that the terms service provided by the Ministry of Health will be suc that the general-practitioner consultants can be encou aged to give up the greater part of their general practic and to become more and more whole-time consultant where their qualifications and experience permit. Th only way in which group medical practice of the typ described in the article of Nov. 6 can be conducted where the firm comprises a bigger proportion of pur general practitioners and where the town and the loc hospital are big enough to contain other groups so tha coöperation of the specialist services within the hospita is conducted in such a way as to be divorced from th financial advancement of a closed corporation and fre from any interference with the general-practitione service.

In the original report, mention is made of orthopædi services; and therefore I should say that my experienc of one such group medical practice is that the tendency i to call in orthopædic consultants late rather than early because—owing to the nature of the commitments o such a group—the recognition of difficulties and o possible complications is not given the continuity and concentration of thought and care which such cases, particularly accident problems, require.

ORTHOPAIS.

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[1] Ihre, B. J. E. Human Gastric Secretion. London, 1938.

[2] Hollander, F. *Surg. Clin. N. Amer.* 1947, 27, 205.

[3] Bloomfield, A. L., Keefer, C. S. *J. clin. Invest.* 1928, 5, 295

THE GENERAL PRACTITIONER

SIR,—Thirteen years ago I decided to enter general practice. Married, with a young family and a substantial overdraft, I had to borrow, by means of insurance policies and a personal guarantee, a further £1200 at 4½% interest. Such limited resources confined my choice not only of locality but also of size of practice and house. After a protracted search I found what seemed the only suitable practice on the market—an old-established one in the north, half urban and half rural, whose owner was retiring owing to ill health. All the usual inquiries failed to reveal any flaw. The agency was an old and trusted one, the accounts had been checked by an accountant, and a discreet personal inquiry was convincing.

Alas, my disillusionment was soon complete. The vendor had been an alcoholic for years, and I soon found that he had a mild Korsakoff's syndrome, for which I had to cut abruptly short the personal introductory period. The next few years were even harder for my wife than for me; but the practice grew, and each year the income showed a steady and reassuring increase. It had perhaps been worth while after all, but I would not have gone through with it had I seen the difficulties at the beginning. Nor would I advise anyone else to undertake a like venture. The National Health Service Act appeared to be a solution of all such future difficulties for those who, like myself, had no money—all who were lured into assistantships "with a view," "no premium required," and "pay out of income." How many assistantships ever matured to partnerships? Not many, I believe.

But again what disillusion this Act has brought with it. Now I have, at a modest estimate, lost one-third of my income; the hope of moving to a more salubrious district is receding, and the prospect of compensation is remote. Worst of all is the fact that I cannot increase my income except at the expense of my fellow practitioners; *only by enticing their patients can I extend my practice.* The most successful, if judged by earnings, will be those who adopt the attitude of the obsequious shopwalker, whose maxim is that the customer is always right. My practice had not grown by extending the number of my panel patients, these remained fairly constant; the population is stable, and the people mostly loyal. Nor had it grown by any great increase in the number of private patients, though of course they became somewhat more numerous, especially during the first few years. The practice prospered mainly by my use of the skill gained from teen years of hospital experience; this was something more than the average general practitioner could offer. Now the zest has gone; my hospital experience has been dearly bought. Almost anyone can write a prescription copied from the *National Formulary*, and fill up a form or send the patient to hospital. It is quantity that counts today, not quality. How much better if this cut-throat competition, so beloved by the B.M.A., had been entirely eliminated by paying us a salary compatible with our experience and years of practice. Happy indeed are those young and healthy enough to emigrate.

G.P.

COMME ON FAIT SON LIT ON SE COUCHE

SIR,—The attention focused on rheumatism in consequence of recent bequests for research leads one to hope that an important aspect of this matter has not been, and will not be, overlooked. I refer to the effect, if any, of exposure to damp on the incidence and course of rheumatic affections. I have already drawn attention in my inaugural lecture at this college to our national apathy in this connexion by reference to a familiar domestic example, in the following words:

> "Advances in our knowledge of the chemistry and physics of textile fibres point without a shadow of doubt to the fact that the right time to make a bed is within ten minutes of getting out of it. Yet the housewife (God bless her!) has been brought up in the belief that a bed must be thoroughly aired for at least an hour before making, preferably by an open window. This, in a country whose atmosphere for more than six months of the year has a relative humidity of more than 50%, is a shocking *misuse of opportunities*, which has to be *paid for in agonies* of human suffering in terms of neuritic and rheumatic affections for which these islands have been famous from time immemorial. Expressed in man-hours of work lost to industry it is even more alarming. And yet the facts are known, and have been known for years; the water-absorbing properties of cotton and wool have been quantitatively assessed, and the number of calories you lose when, by your body heat, you dry out your bed every night can be calculated with terrifying accuracy."

University College, Leicester. L. HUNTER.

ASTHMA

SIR,—May I be allowed to congratulate your correspondent on the perfect description he gave last week of his symptoms as an asthmatic. His description was applicable in every detail to many patients who suffer with asthma from allergy and superimposed microbic infection.

But has he been properly treated? I rather doubt it. He makes no mention of house dust or feathers—the two commonest causes of allergic asthma. The correct treatment in my estimation is to find out by skin tests to which proteins the patient is sensitive, and then to be desensitised to them by a long course of treatment. Where a microbic element is present the vaccine must be given by the small-dose technique: this is essential.

The various medicaments, down to the latest antihistamine drugs, do nothing to cure the complaint; they merely alleviate the symptoms. Breathing exercises should be directed, not to the accessory muscles in the neck, but to the diaphragm, over which so few people have the slightest voluntary control. One has found that those unfortunate people who were gassed, particularly with mustard gas, are always more difficult to help; possibly the lung tissue has sustained some permanent injury.

In brief, then, in my opinion the prime causes of asthma are allergy and microbic infection. All such influences as mental shock and overfeeding (especially at night) being secondary causes of relatively little import. However gloomy the prognosis given by your correspondent in his own case, this is not so in general. Hundreds of cases can be cured if properly treated, and one would like to see it a part of the N.H.S. to provide asthma and allergy clinics for all and within easy reach of all, up and down the country.

London, W.1. FRANK COKE.

THE VOCATION OF MEDICINE

SIR,—Lord Horder's address published on Nov. 6 contains the following passage:

> ". . . . it is possible to break away from the straight line of doctoring at a number of points in the course of training, a fact which should be borne in mind when any one of you begins to doubt if you are sufficiently interested in your human fellow creatures to make a good doctor. You can teach in the preclinical subjects; you can take up X-ray or radium work; you can be a clinical or an academic pathologist; you can engage in public health."

We do not think that Lord Horder can mean what these words imply—that poor doctors, lacking in human feeling, are well placed in the public-health service. If any such persons do seek employment let it be elsewhere than in social medicine; for that discipline asks for a degree of professional skill and a wealth of understanding at least as great as those demanded in other branches of medical work.

Imagine a mentally ill-equipped unsympathetic doctor in charge of services to raise living standards, to secure care and aftercare of sickness, to do the field work of epidemiology; worst of all, imagine such a man in charge of administration, where courtesy, sympathy, and imagination make all the difference between good work and a mechanical routine, adapted for nothing human or humane.

Social medicine can offer testing and rewarding work to the best men the medical schools can produce. Medical officers of health are not all Simons or Southwood Smiths; there are even black sheep amongst them—what flock is without them?—but we have our standards, our ideals, *and our traditions.* We are justly proud of them and it is to these, in all humility, that we would ask our recruits to look.

C. FRASER BROCKINGTON
County Medical Officer, West Riding of Yorkshire.
D. P. LAMBERT
Medical Officer of Health to Sedbergh, Settle, and Bowland Rural Districts, and Divisional Medical Officer.

ANONYMITY

SIR,—May I protest against the pernicious habit of journals of publishing anonymous letters, to which the medical press, too, is becoming increasingly addicted. In the past I have understood that the tradition of journalism was to allow anonymity only rarely and exceptionally. Now almost every week one sees anonymous broadsides or retrograde stabs, as exemplified by three in last week's LANCET. May I plead for a return to the older and healthier tradition.

London, W. 1. DAVID H. PATEY.

*** Some letters lose most of their force and persuasiveness if unsigned. But anonymity has its use if it permits Radiologist, Income-tax Payer, or Ex-Convict to relate an experience, state a point of view, or present an argument without repercussions among his associates. The desire to detach a subject from personalities is sometimes legitimate and even praiseworthy; and English literature and public life owe much to the writings of "Anon." Nevertheless we share Mr. Patey's general preference for signed letters, and we are obliged to him both for his warning and for his example.—ED.L.

COST OF THE N.H.S.

SIR,—In your last issue (p. 831) you state that employed persons are paying *8½d.* per week towards the cost of the National Health Service. While this is quite correct on paper it does not follow that the money is coming out of their pockets. Those employed persons, and there are many thousands of them, who since July 5 have secured a rise in wages on the plea that they could not afford to pay their N.H.I. contributions are no longer paying anything. Their contributions are being paid by their employers with the inevitable result—increased costs of production.

You dispute the statement of "Chirurgicus" that "the average individual is paying £10 a year in National Health Insurance." What he obviously meant was that the average individual is paying that amount FOR National Health Insurance. Whether the payment takes the form of insurance contributions, direct taxation, or indirect taxation is quite immaterial. The money must be found. The latest of the growing estimates of the cost of the health service is £230 million (Minister of Health, *Hansard*, April 8, 1948). Allowing for the further increase which is inevitable, and reckoning the number of those who contribute to the Exchequer in one form or another as 30 million the statement of "Chirurgicus" as above amended is not far wrong. At the moment, however, not one of us is paying a penny for it. It is a gift from that great capitalist country across the Atlantic.

Cambridge. FF. ROBERTS.

*** When "Chirurgicus" referred to "the average individual . . . paying some £10 a year in National Health Insurance," we naturally supposed that, like many other people, he thought that the whole of the weekly contribution (4s. 11*d.* for an employed man) goes to the National Health Service, whereas in fact the portion devoted to this object is only 8½*d.*

Assuming with Dr. Roberts that the N. H. S. will cost over £10 per head of population per annum, is this necessarily too much to pay? The estimated cost of medical care in the United States in 1947 was $6500 million,[1] which for an estimated population of 143 million works out at about $15 per head. Whether we choo to pay for health services privately, by charity, b contributions, or by taxation is a matter of interna bookkeeping. It would of course be possible for th medical services, by excessive development or by wast to claim so much of the nation's man-power and othe resources that they hindered industrial productio instead of promoting it, and Dr. Roberts has done wel to warn us of this danger.[2] But only if our health service became a handicap to production could the American be said to be indirectly paying for them; and th steps taken since July 5, in the hope of ultimatel increasing the efficiency of these services, can hardl have converted them into a pure luxury. In so far they are not a luxury, Dr. Roberts's concluding jibe unjustified.—ED.L.

BASIC SALARY

SIR,—Today, at a local British Medical Associatio meeting, the secretary of the local medical committ demanded more precise criteria by which to jud applications for basic salary. Being the excellent m they are, his committee will undoubtedly do the drastic pruning with immaculate justice; but it still an undeniable fact that the more applications th grant the less money they themselves will earn— situation embarrassing both to them and to the applicant and one which should not exist.

However, this is not my main point. Later, elaborati the difficulties of the task, the secretary was moved cry despairingly, "Everyone has applied!" If everyo has applied, it is apparent that the general opini amongst G.P.s is that the basic salary is desirable a justifiable, regardless of the appreciated fact that reduces the income of men with large lists. I do n defend the method which allows basic salary to redu the amount in the kitty—it should come from a separa fund. But, in implying that applicants for the £3 are disloyal to their colleagues, B.M.A. official policy obviously once again out of touch with the feelings the rank and file.

Whitchurch, Hants. BENJAMIN LEE.

TESTING ANALGESICS

SIR,—We wish to comment on the points raised b Dr. Bernard Kenton in his letter of Nov. 13. O preference for maintained ischæmic muscle pain as background for testing analgesic drugs is simply explaine In conjunction with Dr. F. Prescott and Dr. R. Thorp of the Wellcome Foundation, we originally s out to compare the analgesic properties of 'Physeptone with those of morphine and pethidine by means of th heat-radiation method of Hardy and Wolff; but w found that, although the control threshold values we very constant, the responses to the drugs were extreme irregular and inconsistent. Indeed only 1 of 12 subjec tested (student volunteers) gave appropriately grad responses to different doses of the three drugs; o subject, in response to two separate injections of 10 m of physeptone, showed on one occasion *a rise of* 77% and on the other a rise of 8%, above the threshold. is difficult to account for such *variability even* on th basis of the distracting factors discussed by Wolff an Goodell,[3] who found that psychological influences alo could raise the heat pain threshold by 30% or more.

We therefore sought a method both more reliable an perhaps more closely related to the conditions of diseas and we found that *properly* controlled use of th subjective estimate of intensity of ischæmic muscula pain gave consistent *and* reproducible results, excep for the increase in sensitivity over long periods of time which we discussed *in our* paper.

We agree that the modes of action of analgesics ar complex, *and* that the therapeutic effectiveness of drug in the relief of pain must include reactions impossibl to simulate in normal healthy individuals. As t whether analgesic and euphoric effects can be separated, all that can be said *at* the moment is that the very extensive work on phenanthrene derivatives, and the dies of newer chemical compounds such as pethidine physeptone, have not yet produced drugs which can eve severe pain without their also being liable to duce euphoria and addiction.

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[1] Cost and Quantity of Medical Care in the United States. By Frank G. Dickinson, PH.D. American Medical Association Bulletin no. *66.* *1948.*

[2] *Brit. med. J.* 1948, i, 485.

[3] Wolff, H. G., Goodell, H. *Ass. Res. nerv. ment. Dis.* 1943, 23, 434.

A. J. H. HEWER
C. A. KEELE.

Department of Pharmacology, Middlesex
Hospital Medical School, London, W.1.

FELLOWSHIP FOR FREEDOM IN MEDICINE

SIR,—You were good enough to print a full account last week's issue of the formation of this Fellowship, er the chairmanship of Lord Horder. May we ask to state that all inquiries, including applications for bership, should be made to the hon. secretary, Westminster Palace Gardens, Artillery Row, London, W.1?

G. H. ROSSDALE
E. C. WARNER
Hon. Secretaries.

APPLICATION FOR HOSPITAL POST

SIR,—Encouraged by the letter of "A.B." in your of Nov. 6, I should like to cite a similar experience which the five applicants for an advertised appointnt were asked to attend for an interview at 5 P.M., telephone during the morning of the same day. At time I was working in the country some 200 miles London, where the interview was held.

The actual interview—a mere formality as so often pens—lasted two minutes, and the post was given a man already working in the hospital. In these where no further information is sought during the view, is it necessary to waste applicants' and mittee-members' time for the sake of formality?

I should also like to draw attention to the humour of A and B2 classification of posts. Here those of us ively recently qualified are competing with holders higher qualifications with much more experience. We are told that B2 and B1 posts exist in order to vide training or experience necessary before sitting M.R.C.P. or F.R.C.S. examinations.

NON ÆQUANIMITAS.

Parliament

QUESTION TIME

Royal Commission on the Death Penalty

Replying to a question Mr. CHUTER EDE, the Home tary, said: On July 22 I informed the House that the tion whether there were practical means of limiting the penalty would be explored. The Government have careful consideration to the question how this can be done, and have decided to recommend the appointment a Royal Commission. The terms of reference and membership of the Royal Commission are still under consideration will be announced in due course. At this stage I can say that the scope of the inquiry will be the questions ether liability under the criminal law in Great Britain to capital punishment for murder should be limited or ified, what alternative punishment can be substituted, what are the changes in the law and the prison system lved by any alternative punishment. The commission be invited to take account of the position in those tries whose experience and practice may be of value in idering these questions.

Distribution of Doctors

Sir HENRY MORRIS-JONES asked the Minister of Health hat recommendations he had received from the Central Medical Practices Committee on the question of maldistribution of medical practitioners; and if he would give this atter his consideration.—Mr. ANEURIN BEVAN replied: None so far. The committee are obtaining comprehensive reports on the adequacy of the medical services throughout England and Wales by Dec. 31. I shall naturally give most careful consideration to any recommendations the committee may see fit to make to me in the light of these reports.

Hospitals and Charges to Patients

Mr. PETER FREEMAN asked the Minister what charges, and under what conditions, hospitals controlled by his department might impose on patients; and whether they were informed on admission of such charges.—Mr. BEVAN replied: Patients may go into pay-beds, at full cost. Otherwise they can only be charged for extra privacy in single rooms or small wards, for the extra cost of certain expensive appliances, and for renewal of appliances through negligence. They are informed on admission.

Tuberculosis Patients' Benefits

Mr. T. W. BURDEN asked the Minister of National Insurance if he had considered a request from the National Association for the Prevention of Tuberculosis respecting the hardships imposed on the tuberculosis patients who had had their sickness benefits reduced to 5s. per week under the National Insurance (Overlapping Benefits) Provisional Regulations: and what reply had been sent to the association.—Mr. JAMES GRIFFITHS replied: I have received a letter from the National Association about the application of the Overlapping Benefits regulations to tuberculosis patients in hospital and have passed it for consideration to the National Insurance Advisory Committee. The regulations, so far as they relate to patients in hospital, are still under consideration and I understand that the committee is prepared to receive further evidence bearing on this part of the regulations from responsible persons or bodies.

Public Health

Foods

BY the Transfer of Functions (Food and Drugs) Order, 1948, the Ministry of Food is now the central department concerned with the composition, description, and inspection of food, and with hygiene conditions in the food trades. The Ministry's responsibilities will be discharged by three divisions:

1. The food standards and labelling division, which is responsible for the promotion of food standards and exercises the central department's functions in relation to those sections of the food and Drugs Act dealing with the composition and description of food, the Defence (Sale of Food) Regulations, and the Labelling of Food Order. It handles all technical correspondence with chemists.
2. The food hygiene division, which is responsible for the promotion of measures to improve hygiene conditions in the food trades, and exercises the central department's function in relation to those sections of the Food and Drugs Act dealing with food inspection and hygiene.
3. The liaison division (food standards and food hygiene), which provides for the two other divisions a liaison with local authorities and with the public, other than manufacturers and traders. It deals with all inquiries from local authorities regarding day-to-day administration, including applications for the Minister's consent to prosecutions, public analysts' appointments and reports, and applications under sections 15 and 16 of the Food and Drugs Act, 1938. It is also responsible for liaison with local-authority associations and professional bodies.

The address of all three divisions is 47, Portman Square, London, W.1 (Tel.: Welbeck 5500).

FOOD STANDARDS COMMITTEE

The Ministry's food standards committee has appointed a subcommittee to consider the effect of ingestion of foods contaminated with minute traces of metal and other injurious elements, and the possibility of prescribing limits for such contamination. The committee itself is at present considering the possibility of prescribing standards for ice-cream, processed cheese, iodised salt, edible gelatin, and preserves.

CATERING-TRADE WORKING PARTY

Dr. Edith Summerskill, parliamentary secretary to the Ministry of Food, announced in the House of Commons last week the appointment of a working party to recommend precautions for securing cleanly conditions in the catering trade. The chairman is Sir William Savage, M.D., and members include Dr. W. A. Lethem (Ministry of Food), Dr. A. L. Shinnie (medical officer of health for Westminster), Dr. E. L. Sturdee (Ministry of Health), Dr. I. M. Sutherland (Department of Health for Scotland), and Dr. Robert Sutherland (medical adviser and secretary, Central Council for Health Education).

Obituary

STUART McDONALD

M.A. DURH., M.D. EDIN., F.R.C.P.E., F.R.S.E.

Dr. Stuart McDonald, emeritus professor of pathology in the University of Durham, died in Edinburgh on Nov. 15.

He was born at Castle Douglas, in the Stewartry of Kirkcudbright, and educated at Dumfries Academy, where he was one of a notable band of scholars which included Sir William Wright Smith and the late R. W. MacKenna of Liverpool. In 1896 McDonald graduated M.B. at Edinburgh, and after postgraduate study at Freiburg he was appointed lecturer in pathology and bacteriology at the Edinburgh Extramural School of Medicine. He was also for a time pathologist to the Birmingham General Hospital. In 1907 he was awarded the gold medal for his M.D. thesis.

He went to Newcastle as the first whole-time professor of pathology in the University of Durham, and almost at once he was appointed pathologist to the Royal Victoria Infirmary. This dual appointment gave him opportunities which he was quick to seize, and it was not long before he had built up a fine department. But the 1914–18 war interrupted this side of his work. Troubled times faced the Newcastle school, and in the reorganisation period he was translated to the deanship, whose duties seriously interfered with his more congenial activities. But as dean he was most helpful to each and every student, and many men have reason to be grateful for his advice. During these busy years he also took charge of wards in the 1st Northern General Hospital and proved himself a capable if rather critical clinician.

Prof. Grey Turner writes: "McDonald was imbued with the Edinburgh tradition and soon showed himself a most competent morbid anatomist and histologist so that his work was of great value to the clinicians. He also inherited a tradition of responsibility as a teacher and he took infinite pains to develop that side of the work. Always eager to help his juniors with their problems, in his early days at Newcastle he started the Pathological Club, which consisted of members of the staffs of the college and infirmary, of all brands, with a sprinkling of the keenest of the general practitioners. The result was a delightful body and the rather informal and friendly meetings, always held latish on in the evening, were distinguished by the enthusiasm and enjoyment of the members. Discussion was free and unhampered and often we sat late, but never too late for McDonald! In his experimental work on meningococcus infections in monkeys and in other problems he always insisted that we should get 'back to the soil,' for he had constantly in mind the reactions of the body to pathological invasions.

"He had many sorrows to bear. When most beset he found solace in music, and he often used to treat himself to gramophone recitals alone and with the lights out. Poetry also made a great appeal to him, and almost our last correspondence, only a few weeks ago, concerned the life story of Ada Smith, the Northumberland poetess, whose poem *In City Streets* he often quoted:

> 'My eyes an ache to see the brown burns flowing
> Through the peaty soil and tinkling heather-bells.' "

McDonald was one of the few remaining original members of the Pathological Society of Great Britain and Ireland. He was long a most faithful attender at the biennial meetings of the society, and in days when these meetings were smaller and more convivial no-one was more warmly welcomed, especially as a post-prandial raconteur.

"In earlier years," Prof. Matthew Stewart recalls, "he made some notable contributions to pathological science, two of the chief being those on subacute liver atrophy with Lindsay S. Milne and on malakoplakia of the bladder and kidneys with W. T. Sewell. I believe he was the first person to observe asbestos bodies in the lungs of an asbestos worker. I was present when the late W. E. Cooke showed McDonald the sections from his pioneer case—the second on record—of pulmonary fibrosis occurring in an asbestos worker. This case had already been reported in 1924 by Cooke, who had figured and described 'particles of mineral matter . . . of various shapes' and having sharp angles, in sections of the lungs; but while he had regarded this foreign material as 'asbestos particles' he had failed to notice the 'peculiar bodies' to which McDonald now drew his attention.

"Those of us who knew him well in the years gone by recall a friend whom it was always a delight to meet, and a pathologist with whom it was a pleasure as wel as an illumination to discuss problems of commo interest. Year by year McDonald returned to Gallowa to fish for trout in, I think, the twin lochs of Bargatto and Glentoo in the parish of Balmaghie. On retiremen from his chair, he went to live at Broughton, where h was able to continue his enjoyment of the contemplati man's recreation."

Mrs. McDonald died in 1921, and their only son another Stuart McDonald, in 1946, within a year of hi appointment to the St. Andrews chair of patholog

Diary of the Week

NOV. 28 TO DEC. 4

Monday, 29th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. R. M. B. MacKenna: Dermatology in its Relati to General Medicine. (Part II.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Sir Cecil Wakeley: Pancreas and its Relations.
5 P.M. Dr. L. E. Glynn: Liver-function Tests.

Tuesday, 30th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. E. B. Strauss: Psychoneuroses and their Treatme

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Brian Schofield: Digestion.
5 P.M. Prof. J. Z. Young: Injury and Repair of Peripher Nerves.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.

BRITISH ASSOCIATION OF PHYSICAL MEDICINE
5.30 P.M. (*Royal College of Surgeons.*) Lord Horder, D Francis Bach, Dr. F. S. Cooksey: Domiciliary Phys therapy.

Wednesday, 1st

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. Schofield: Digestion.
5 P.M. Professor Young: Injury and Repair of Perip Nerves.

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.15 P.M. Dr. J. W. Trevan, F.R.S.: Statistics from the Stan point of the Pharmacologist. (First of two lectures.)

Thursday, 2nd

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. E. Lloyd: Pleurisy and Pleural Effusion (Part I.)

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. James Whillis: Hip-joint and its Movements.
5 P.M. Dr. R. G. Macfarlane: Hæmorrhagic States.

INSTITUTE OF NEUROLOGY, Queen Square, W.C.1
5 P.M. Dr. Raymond Garcin (Paris): Contractures.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. G. B. Dowling: Scleroderma.

CHADWICK LECTURE
4.30 P.M. (St. Mary's Hospital medical school, W.2.) D Charles Seeley: Preventive Medicine and Clinical Medici in Relation to Public Health. (Malcolm Morris lecture

ROYAL PHOTOGRAPHIC SOCIETY, 16, Prince's Gate, S.W.7
7 P.M. *Medical Group.* Mr. R. F. West, Mr. O. O. Redman Medical Photography and the Publisher.

Friday, 3rd

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. W. H. Sheldon: Steatorrhœa in Childhood.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. Whillis: Intrinsic Muscles of the Hand.
5 P.M. Dr. Macfarlane: Hæmorrhagic States.

MAIDA VALE HOSPITAL, W.9
5 P.M. Dr. H. E. Dimsdale: Case demonstration.

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. R. A. Beaver: Anæsthesia for Thoracotomy.

Saturday, 4th

BIOCHEMICAL SOCIETY
11 A.M. (Middlesex Hospital, W.1.) Short papers.

Notes and News

N.H.S. FIGURES

Facts and figures about the National Health Service were given by Mr. John Edwards, parliamentary secretary to the Ministry of Health, in opening the Public Health and Municipal Engineering Congress in London on Nov. 15. Despite the immensity of the administrative effort in getting the service ready to start on July 5, the Ministry of Health staff involved was, he said, little more than 800, including every clerk and typist. The work included setting up 138 executive councils, each with 25 members—a total of 3450, of whom 552 were appointed by the Minister himself. Existing hospital accommodation had to be surveyed to decide what premises and property were transferable; areas for the grouping of hospitals had to be defined; and the Ministry had to set up *regional hospital boards, with about 380 members, and* boards of governors of teaching hospitals with over 1000 members. In all, 2587 hospitals were taken over, with [illegible] staffed beds, and 236 hospitals, were disclaimed. On the mental-health side, 108 mental hospitals had to be designated; 130 public-health and public-assistance premises were also designated for use as mental hospitals; 218 institutions were "directed" to be used for mental defectives; and 190 premises were designated for use for emergency mental cases. Nearly 1200 schemes put forward by local health authorities for reorganising and extending their health services had to be examined, adjusted where necessary, and approved by the appointed day. Over 250,000 staff had to be transferred to the new bodies running the health service and brought into a coherent superannuation scheme, and terms and conditions of service had to be settled—temporarily at first. Finally the health scheme had to be explained to the public—by the household leaflet, by press advertising, and by posters and films.

Those coöperating in the service in England and Wales, Mr. Edwards said, are 18,165 general practitioners out of [illegible], 8519 dentists out of 10,000, 5000 ophthalmic opticians and dispensing opticians, and 14,000 chemists. There are 40,000,000 people on doctors' lists. Prescriptions are being dispensed at the rate of over 140 million a year—about [illegible] rate expected. About 1,700,000 people have already had dental treatment and about 1,500,000 have been supplied with spectacles.

DENTAL ASSISTANTS.

When, in the middle of last century, dental education was concentrated in training schools, dental surgeons had to look elsewhere for the help they once had from pupils; and since then women assistants have been largely employed. They work as secretaries, receptionists, or chairside assistants, or sometimes as all three.

A joint committee, representing the various dental associations, has now reported[1] on the training and conditions of service of these assistants, and particularly of the chairside assistants. In 1946 these numbered some 6000 among the 12,000 dental surgeons in private practice, with a further [illegible] to the 1000 surgeons in the public service. Inquiry showed that hardly any of these assistants left their employment except to marry, and the average length of service was about five years. Thus there is little ground now for the pronouncement of the author who some years ago suggested that the assistant chosen should be "one old enough to have a serious view of her work, or one financially poor enough to value the opportunity." Among the chairside assistant's duties are: to attend on the patient; before the operation to lay out the appropriate instruments and dressings; during the operation to assist the surgeon and to prepare materials for fillings or impressions; and afterwards to clean and sterilise instruments and tidy the surgery. Occasionally a knowledge of general-anæsthetic apparatus is required, and in specialist practices there are further duties.

The committee suggests that ultimately every busy practitioner should employ one woman solely on chairside work; and it expresses itself completely opposed to any extension of the assistant's present range of work. Training, to begin after the 17th birthday, should, in the committee's view, last one year and consist of two parts, each of six months; the first half year would be spent at a training-centre and the second in paid employment. Moreover, "a reasonable efficiency in typing and some fundamental knowledge of book-keeping is highly desirable. . . . A knowledge of first-aid and home nursing is also valuable." At the end of training the successful trainee should be awarded a standard certificate of proficiency; those already employed as assistants should be given the opportunity of gaining the certificate, either by attending a part-time course, or, if they have been doing this work for over three years, by taking the week's refresher course recommended for student assistants at the end of their year's training. The committee also suggests that the successful candidate should be permitted by regulation to call herself "dental nurse."

The report holds that no special general-educational certificate should be required of an entrant. It emphasises, however, that she should have had a good general education, and that she should conform to the description given by one of the witnesses who appeared before the committee: "Clean, alert, and neat in her dress; of pleasant countenance; healthy looking teeth; pleasant voice; ready smile; confidence of manner and having a ready wit." The recommended salary for certificated assistants ranges from £3 at the age of 18 up to 5 guineas at 25, with weighting for those employed in the London area and additions for specialist work. At present values this does not seem an extravagant reward for assistance without which "the efficiency of the dentist and his capacity for work are both seriously handicapped and the strain of practice is materially increased."

FILMS FOR THE CITIZEN

Most people grumble when it comes to paying the rates; few stop to think how much they get for their money. The Middlesex county council are effectively tackling this civic churlishness by showing informative films about the services which their ratepayers own. *Taken for Granted* describes the West Middlesex main sewerage scheme which for less than 2*d.* a head per week deals with all the waste effluents of nearly 1½ million people. In *Good Health* we see something of the work of the hospitals which the county council have been able to hand over to the appropriate regional boards with pride and a little natural regret. A nurse and an almoner speak for their professions; appointments are honoured by doctors and outpatients with unwavering punctuality; and a mass-radiography unit rapidly surveys a queue of volunteers. The Metropolitan Water Board is responsible for a third film of this kind. *Every Drop to Drink* follows London's water-supply from its sources—the Thames, the Lea, and Sir Hugh Myddleton's elegant New River—to the familiar tap in the kitchen.

RESEARCH ON ARTIFICIAL LIMBS

In a recent parliamentary reply attention was drawn to the work of the research unit at Roehampton, under the direction of the Standing Advisory Committee on Artificial Limbs, which has included the following practical results and improvements: (1) a number of new arm appliances have been added to the existing list and others are being redesigned and improved; (2) six trial orders for a new artificial arm of improved design have been placed, and should these prove satisfactory the arm will go into general production; (3) a new method of suspension of an artificial leg by suction socket is under trial by patients and the trials are most encouraging; (4) a socket of new design for above-knee amputation is under trial by over 100 patients; (5) two new mechanical hands have been submitted by the contractors to the Ministry of Pensions and are under trial; (6) an apparatus is under experimental test for measuring comparatively the thrust which walking imposes on both the artificial and the sound limb. Work is proceeding on the improvement of crutches.

A NEW HEARING-AID

The first noticeable feature of the 'Monostat' hearing-aid is its outward elegance. The actual circuit and microphone are concealed, but the batteries are easily disclosed by a press-button weighted lid. It is driven by a special type of low-tension cell with a long life, costing about ¼*d.* per hour of use. The high-tension battery, apparently of a standard size, costs 2*s.* and has a life with intermittent use of 350 hours. The running cost of this instrument is claimed to be lower than that of any other instrument of comparable size. One novelty is automatic volume control, by which high magnification is possible without the shock of extra loud sudden noises such as the banging of a door; and intelligibility is greater than with "peak clipping," which cuts off all sound above a certain voltage and thus introduces serious distortion. The makers say that the instrument can be set for "combined maximum output and amplification control to the user's particular requirement and he need not touch it again all the time the instrument is in use. . . . The amplification is raised and lowered entirely automatically to cope with the different levels of sound. Even shouting right into the instrument does not make any difference." For this reason it marks some advance in the design of hearing-aids. Unfortunately, at an estimated price of 37 guineas, it is very expensive.

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[1] British Dental Association, Incorporated Dental Society, Public Dental Service Association: Report of the Committee of Inquiry into the Training, Wages, Conditions of Service, and Title of Women Assisting Dentists in Public or Private Dental Service. Obtainable, price 1*s.*, from the secretary of the committee, 13, Hill Street, Berkeley Square, London, W.1.

The aid is manufactured by Messrs. Multitone Electric Co. Ltd., 223, St. John Street, London, E.C.1.

University of Oxford

The honorary degree of D.SC. is to be conferred on Lieut.-General Sir William MacArthur.

University of Cambridge

On Nov. 13 the following degrees were conferred:

M.D.—J. N. Agate, H. W. Balme, Frances O. Naish, M. B. Paul.

M.B., B.Chir.—T. B. Anderson,* Ellen M. Bennett, W. T. C. Berry,* Kathryn H. Cohen, Brenda M. Eley, Phyllis M. Glasspole,* Ruth M. Lloyd-Thomas, I. K. R. McMillan, F. G. Patrick,* Hermione B. Roxburgh,* Betty J. Spedding, Margaret H. Whitby.

* By proxy.

University of London

Dr. E. R. Boland has been elected dean of the faculty of medicine for 1948 to 1950.

The title of reader in experimental pathology has been conferred on Dr. P. A. I. Gorer in respect of the post held by him at Guy's Hospital medical school.

At recent examinations the following were successful:

M.B., B.S.—Elizabeth Bennett, Paul Chadwick, K. M. Citron, Brian Creamer, A. A. Eley, H. J. A. Hahn, Cherry D. Heath, Joan E. Jermyn, G. D. Starte (with honours); M. S. M. Adams, Maureen B. Adams, O. P. T. Alexander, A. M. Angel, Marion M. Ashforth, R. N. H. Askham, D. S. G. M. Bailey, J. R. Ballantyne, T. W. Barnes, Barbara Baxter, S. J. Beales, M. D. Begley, Silvio Benaim, G. C. Blake, Hazel C. Blomfield, W. R. Bodenham, Edda L. I. Boesen, J. M. N. Boss, J. H. Boydell, Margaret L. M. Bridges, Ethel A. V. Brooks, P. D. Bryant, Rachit Buri, F. P. Cassidi, Ivor Chance, J. A. Cheese, D. W. Clark, P. S. Clarke, I. H. Colley, A. A. Collis, A. J. P. Crowdon, Mary E. Curling, H. W. D. Davies, J. H. Davies, T. D. L. Davies, L. R. Davis, E. L. Dawe, D. C. Douchar, Daphne M. Dowlen, E. M. Edwards, Evelyn S. Elliott, Hilary J. Elphick, D. M. Evans, Emrys Evans, D. C. Faull, K. J. Fisher, D. G. Fleck, C. A. Foster, P. B. Foxwell, Kenneth Froome, G. G. Garlick, Phyllis A. George, A. M. Goldthorpe, K. C. D. Gordon, D. B. Goss, R. L. Gothilf, E. W. Graham, A. H. Griffith, M. W. J. Grummitt, D. B. Gunasekara, June M. S. Harrington, D. F. N. Harrison, R. D. C. Hart, G. E. Haward, P. W. Head, J. L. Herbert, D. A. Hodgson, E. R. Hodgson Todd, H. D. A. Hope, Pamela C. B. Hopkins, D. A. Howell, F. H. D. Hutter, A. H. Jack, D. W. James, Barbara J. Jeffrey, F. H. W. Johnson, C. R. Jolly, D. H. Jones, E. F. Jones, J. S. Jones, Cyril Joseph, D. H. Judson, Gerald Kaufman, R. A. Keable Elliott, Zoë T. Kelly, Hari Ratan Ker, Mohammad Rafiqur Rahman Khan, F. R. S. Knight, Percy Lancer, B. H. Lawrence, J. C. S. Leverton, D. C. Lindley, R. H. Longton, G. N. Lumb, Bernard Lytton, W. E. Macbean, R. P. C. MacDonald, Thomas McKendrick, David Mendel, R. L. Mendez, Leela Menon, Marie D. Merchant, D. K. Morgan, Elizabeth M. Mostyn, J. G. Neville, Margaret C. Newmark, P. B. O'Neill, M. W. Partington, Jacqueline I. C. Payne, G. W. Piper, D. G. Price, E. R. Price, K. J. P. Price, V. G. Radclyffe, George Selvaraja Ratnavale, Isidore Redstone, E. G. Rees, W. J. St. E. Rhys, B. W. Richards, H. R. C. Riches, Janet P. Rickard, P. P. Rickham, Douglas Rossdale, D. P. Rough, D. G. Rushton, M. V. Salmon, A. C. E. Sandiland, Benjamin Schwartz, M. L. J. Segall, J. C. Sherris, B. P. Skinner, J. F. Skone, G. B. Smith, D. B. Spanton, Diana H. Spears, Rosemary Stephens, Schier Sternberg, M. T. Sweetnam, Hilda Joan Tanner, D. G. Taylor, Thomas Taylor, Anita J. Thomas, O. G. Thomas, J. V. Thurston, P. H. Tribe, A. A. Turner, R. J. Vale, John Vance, P. R. Wagner, Daphne M. L. Walters, Mary B. Watson, F. E. Weale, Joan C. Wells, Margaret M. Whitaker, Horace Williams, W. J. Williams, M. B. Wingate, Mary I. Wray, John Zamler.

British Council Scholarships

Some 60 British Council scholarships out of a total of 359 awards for 1948–49 have been given to scholars studying medical subjects. These subjects cover the whole field of medicine as the following examples show: an Australian woman doctor is studying at the Institute of Child Health, London; a Brazilian doctor is taking a course in pædiatrics at Glasgow University; the Royal College of Nursing is arranging a programme in administration for a nurse from Guatemala; and two radiologists from Poland are studying, one at the Postgraduate Medical School of London, and the other at the Christie Hospital, Manchester.

Royal College of Surgeons of England

The honorary fellowship of the college has been conferre on Dr. E. D. Churchill, John Homans professor of surge Harvard University. The diploma was presented to Profe Churchill by Lord Webb-Johnson, president of the coll after the Buckston Browne dinner of fellows and memb on Nov. 11.

Pay Beds in Liverpool Region

The Liverpool regional hospital board have recommen to the Minister of Health that, under section 4 of the Natio Health Service Act, 147 beds in their region should be reser for patients who wish to pay a small extra charge for amenit and that, under section 5, 252 beds should be reserved patients who agree to pay the full cost of maintenance. board have further recommended to the Minister that charge for beds set aside under section 5 should be redu by the average cost per patient in an open ward. board are also making representation to the Minister for equalisation of charges for pay-bed accommodation throug the region.

Blood Donors

More donors gave blood to the National Blood Transfu Service during the June quarter of this year than at any t since the war. They numbered 98,055, including 24,075 donors. In the same period 30,497 people joined the servic the highest number since March, 1947—bringing the t strength to 377,304 for England and Wales. During quarter 77,148 bottles of blood were issued—a rise of s 21,000 over the same quarter of last year, and of 31, compared with the same quarter of 1946. Of dried pla 15,849 bottles were issued, compared with 14,959 in corresponding quarter of 1947, and 13,906 in the correspond quarter of 1946. It is estimated that another 142,000 do are needed in England and Wales.

Sir Arnold Stott has been appointed an extra physic to the King's Household.

Dr. D. R. Lewis has been nominated a sheriff for Brec shire in the King's Bench division of the High Court Justice.

Dr. C. H. Andrewes, F.R.S., has left for Hungary, where h lecturing on behalf of the British Council.

On Nov. 10 Dr. J. Trueta was presented with the p Labourie by the Académie de Chirurgie de Paris for contribution to the progress of surgery. He later addre the assembly on the renal circulation and its patholo with particular reference to the research which he and colleagues carried out at the Nuffield Institute, Oxford.

CORRIGENDUM: *Myanesin in Tetanus.*—In the article l week by Dr. Edwards and Dr. Wood, the 4th and 5th li of the section on treatment (p. 807) should read: " myanesin, 1 g. in 10 ml., was diluted with an equal quanti of water . . ."

Births, Marriages, and Deaths

BIRTHS

BRENAN.—On Nov. 14, at Cosham, Hants, the wife of Dr. A. H. Brenan—a daughter.

CARR.—On Nov. 18, in London, the wife of Dr. R. U. Carr, M.B —a daughter.

FELTON.—On Nov. 17, at Preston, the wife of Dr. W. F. Felton a daughter.

GARROW.—On Nov. 13, at Southsea, the wife of Dr. D. H. Garr —a daughter.

LESLIE-SPINKS.—On Nov. 18, in London, the wife of Lieut.-Colon A. J. Leslie-Spinks, R.A.M.C.—a son.

RENDLE-SHORT.—On Nov. 12, the wife of Dr. John Rendle-Short a daughter.

SQUIRE.—On Nov. 13, at Oxford, the wife of Mr. C. M. Squi F.R.C.S.—a daughter.

THOMSON.—On Nov. 16, at Bournemouth, the wife of Dr. R. Thomson—a son.

TROWER.—On Nov. 15, the wife of Dr. G. S. Trower—a son.

DEATHS

CROSS.—On Nov. 17, at St. Neots, Hunts, Edward John Cro T.D., M.D. Durh., D.P.H., aged 83.

PICTON.—On Nov. 19, at Holmes Chapel, Derbyshire, Lionel Jam Picton, O.B.E., M.A., B.M. Oxfd, aged 74.

ROZELAAR.—On Nov. 21, in London, Abraham Levie Rozela M.R.C.S.

VINCENT.—On Nov. 12, at Reigate, Herbert Edmund Vincen M.D. Lond., aged 84.

SCIENTIFIC CONSTRUCTION OF THE NORMAL CHILD'S DIET *

ALAN BROWN
M.D., F.R.C.P.(C.), F.R.C.P.
PROFESSOR OF PÆDIATRICS IN THE UNIVERSITY OF TORONTO

It is our belief, and I speak for the department of diatrics of the University of Toronto, that the proper pervision of the child's nutrition is one of the most fective means of maintaining good health. It should not assumed that we neglect other factors such as the pervision of hours of sleep, the amount of exercise, h air, and sunshine obtained, and the treatment of i of infection ; but of all the means at the disposal the present-day physician interested in preventive diatrics none gives greater health dividends than the oper supervision of the child's nutritional requireents.

Ebbs, of our department, has recently shown that the ogress of an infant during its first six months of life greatly affected by the mother's diet during the enatal period (Ebbs et al. 1942). In this extensive udy, which was carried on in collaboration with the partment of obstetrics, the prospective mothers were erviewed three or four months before term. They e instructed to keep an accurate record of all the d they ate for a week. This was carefully checked a dietitian, and on the basis of these records the men were divided into two groups—those on poor ts and those on good. Half of the mothers on the or diets were provided with the following supplemeny foods per day : 30 oz. of milk ; 1 oz. of cheese ; gg ; 1 orange ; $4^1/_2$ oz. of *tinned tomatoes* ; 2 tableonfuls of a special preparation of wheat germ which tained added iron (about 6 mg. per tablespoonful) ; a capsule containing 2000 I.U. of vitamin D in the of viosterol. Capsules *containing* plain corn oil given to the mothers remaining on the poor diet, duce any psychological effect. The mothers given upplementary food developed much fewer and less e complications during the prenatal period, labour, the succeeding six weeks than those remaining on r usual poor diet ; 86% of the mothers given the pplementary food were nursing their infants six weeks t partum, whereas only 59% of the mothers on the or diet were doing so.

The comparison of the records of the infants during e first six months of life is equally impressive. The abies born of the mothers eating the poor diet showed a uch higher incidence of respiratory infections (colds, onchitis, and pneumonia), rickets, tetany, dystrophy, d anæmia. The provision of an adequate food-supply r the child even before birth is therefore very important. uart and his collaborators, in Boston, have also ported that the prenatal course of the mother and the ndition of the infant at birth reflect the type of diet ten during pregnancy (Burke et al. 1943).

Despite the great advances made in the artificial eding of infants I am still convinced that breast-milk roduced by a healthy mother is the best of all feedings. The general public do not seem to be fully aware of this fact, and we physicians should bear some of the blame or this state of affairs. The part that excellent prenatal diets play in the establishment and maintenance of successful lactation has been emphasised by Ebbs et al. (1942). The Ministry of Food has been well aware of this fact, as is evident from the increased rations allotted to pregnant women. Regular adequate care of the nipples during the latter half of pregnancy is also important. During lactation the mother's needs are even higher than during pregnancy. If you glance through the recommended daily allowances drawn up by the Food and Nutrition Board of the National Research Council in the United States (1945) you will note that in every essential, except calories, the lactating woman's allowances are higher than at any other period in her life.

Another aid to successful lactation that is often neglected is the provision of nurses skilled in handling the " nursing couple " during the first two weeks or so after the infant's birth. Waller (1938) and Middlemore (1941), here in England, have done outstanding pioneering work in this field, as have also the Maternal and Child Health Services in New Zealand. Certainly on our continent we have not applied this knowledge, and as a result many infants are denied the physical and psychological advantages of breast-feeding. By all means we should see that there are enough specially trained nurses in our obstetrical wards, so that every mother will receive the necessary help in the early stages of lactation. Evidence is also accumulating that the giving of supplementary milk feeds during the first few days lessens the mother's chance of establishing adequate lactation. The use of dilute lactose water is preferable, at least until it is evident that the maternal milk-supply is inadequate. The advantages of having the baby with the mother has also been investigated (Jackson 1946). In this case it is usual to restrict visitors to one member of the family to save the newborn from the risk of infection, and to provide means for the mother to wash and disinfect her hands before handling the baby. A normal mother can undertake a good deal of the care of the baby from the second day on, and having her infant in close proximity seems, in most cases where the mother wishes it, to be helpful to her. Here in Great Britain, I believe you have kept up this practice in many of your hospitals. Allowing the infant to nurse when it is hungry, even though this may entail frequent feeds in the first few weeks, stimulates lactation.

The self-demand schedules in breast-feeding are an interesting development (Gesell and Ilg 1937). At a relatively early age the infant usually settles down to a fairly regular schedule, and in most cases the number of feeds is reduced automatically earlier than when the usual schedule is followed. The increased freedom that the mother has in the management of her child produces a less tense mother and a more contented baby. This type of régime is well worth looking into and may provide a means for increasing the incidence of breast-feeding. At any rate the days of rigid schedules are past. Nowadays, when a normal breast-fed infant wakes an hour or so before his feeding-time, the nursing mother is advised to feed him right away rather than leave him to exhaust himself by crying. Conversely, if he oversleeps his feeding, the mother is no longer advised to wake him. However, a complete self-demand schedule is a great deal more difficult to follow in the case of the artificially fed infant and, for the present, this system probably should be undertaken only by intelligent mothers anxious to adopt it.

HUNGER AND COLIC

One of the most frequent diagnostic mistakes regarding the nutrition of the newborn infant is the error of confounding colic with hunger—newborn infants suffer nowadays not from overfeeding with breast-milk but from lack of it. For every case of overfeeding we probably see 99 cases of so-called hunger colic. Practically all young mothers, overtaxing their strength in their eagerness to be up and about after their long confinement, harried by tales told by old maids and barren women and by conflicting advice of well-meaning neighbours,

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* An Ingleby lecture delivered at the University of Birmingham on May 18, 1948.

Birmingham, where histological evidence of rickets in the same age-group has been found in 37·8% of the children examined (Parsons 1947).

DENTAL CARIES

Several investigators, including Lady Mellanby (1934), working in Great Britain, and Agnew and his colleagues working in our department (Anderson et al. 1934), had previously shown that the addition of vitamin D decreased the incidence of dental caries. In the latter study two groups of children, aged 5–15 years, were observed for a year. The diets for both groups were exactly the same, except that one group received additional vitamin D daily. Radiograms were taken and instrumental examinations of the teeth were made without any knowledge of which group the children belonged. When the examinations were completed the results were tabulated, and it was found that the number of markedly progressive cavities and the number of new cavities were twice as frequent in the children aged 10 years who did not receive an adequate supply of vitamin D as in those who did. Therefore, to prevent rachitic changes in the bones and to reduce the amount of dental caries, it is wise to continue the daily administration of a good source of vitamin D, such as fish-liver oil, during the eight or nine colder months of the year throughout the whole of the growing period. The daily dose should be about 400 I.U.

INFANTILE SCURVY

Infantile scurvy is probably as rare in Great Britain as it is in Canada. Here again we admire the resourcefulness and energy with which the Ministry of Food, with the assistance of many private citizens, provided vitamin C in suitable forms for your infants during the war.

A great number of food samples have been assayed for vitamin C in our nutritional laboratories (Johnstone et al. [illegible] Truscott et al. 1946). For example, orange juice squeezed from the oranges bought by the hospital was assayed weekly for a year, and the figures were averaged. The average amount of vitamin C in orange juice was found to be three times that found in tomato juice. Therefore orange juice is the preferable antiscorbutic for the infant. Some years ago Snelling and Jackson (1939), of our research staff, reported that the plasma vitamin-C levels of infants under the age of 3 months not receiving any additional vitamin C were very low. Though frank scurvy is not seen until the age of about 6 months it develops slowly, and we believe that such low levels of vitamin C in the blood are unphysiological. Therefore small doses of orange juice should be started when the infant is about [illegible] weeks old. The amount is increased gradually so that by the age of 3 months the infant is receiving 2 oz. of orange juice daily, diluted with half as much boiled water. More of the vitamin is retained if it is given in divided doses. The same procedure is recommended for breast-fed infants.

Tests in our clinic have shown that ascorbic acid given in the form of orange juice is much more effective than synthetic ascorbic acid in the treatment of infantile scurvy. This is thought to be due to the presence of other factors, one of which has an antihæmorrhagic effect, in the orange juice. It has also been found that synthetic ascorbic acid has not so favourable an effect on the repair of scorbutic changes in guineapig's teeth as has orange juice. Vitamin C is very soluble in water, and if a diet very low in this vitamin is eaten, the body is rapidly depleted of it.

It is generally accepted that as small an amount as 5–7 mg. of vitamin C will prevent the development of scurvy, but at least from 4 to 6 times these amounts are recommended for optimal growth and health. In fact, a considerable body of evidence indicates that even higher amounts are preferable. The following study in which several members of our staff (Linghorne et al. 1946) took part supports this last statement:

A group of otherwise healthy Air-Force ground-crew men with mild or moderate gingivitis were given local treatment which cleared up or markedly reduced the condition. They were then placed in four groups and kept on constant daily intakes of vitamin C. One group received 10 mg. a day, the second 25 mg., and the third and fourth 75–80 mg. Except in the third group the vitamin C was obtained from foods. These diets were eaten for eight months. The men receiving 75–80 mg. a day showed definitely less recurrence of the gingivitis than did those receiving 10–25 mg. a day. In addition to carefully examining and recording the condition of the gums at monthly intervals, the plasma-vitamin C level was also determined and vitamin-C assays on about 25% of all the food served were carried out with due care.

Frequent food analyses have shown that relatively few common Canadian foods contain high or even moderate amounts of vitamin C. These superior foods include citrus fruits, raw or canned; the cabbage family; turnips; potatoes; and tomatoes. Immediately after harvesting, potatoes were found to contain 20–30 mg. of vitamin C per 100 g. Two months later the amount had dropped to 15–20 mg. per 100 g., and from then on it gradually decreased to about 10 mg. per 100 g. Tests on the effect of cooking showed that the use of the minimum of boiling water, the shortest period of cooking consistent with maximal palatability, and the avoidance of mashing or keeping warm after cooking minimised the loss of this vitamin. Leaving the skins on while cooking the vegetable was an advantage, as was also the reduction of cutting by boiling the vegetable in wedges instead of in shreds. Most of the loss was due to the leaching out of the vitamins into the cooking-water.

Raw cabbage and the other members of the cabbage family are very rich in vitamin C, providing 60 mg. in 3½ oz.—i.e., in about one cupful. Strawberries, raspberries, currants, and cantaloups are also good sources of this vitamin. Unfortunately apples, pears, peaches, plums, and grapes are low in vitamin-C content. Many palatable Canadian diets were found to contain less than 5–7 mg. of vitamin C a day (Truscott et al. 1946).

VITAMIN-B COMPLEX

We have never observed specific symptoms, in an infant or child, that could be ascribed to deficiency of any member of the vitamin-B complex. However, in experiments on animals subnormal weight gains precede the development of specific deficiency symptoms. It may be that some of the poor weight gains that are seen during infancy are due to an insufficiency of these factors. Five of the B vitamins have been demonstrated to be essential for man: thiamine, riboflavine, nicotinic acid or nicotinamide, pyridoxine, and choline. Probably the other identified members of the B complex will eventually prove to be essential also, and it is likely that there are other such factors which have so far eluded discovery. Therefore, when you wish to administer the vitamin-B complex, it should be given in some form that contains not only the known members but also the unknown ones.

Another problem undertaken by our laboratory was that of developing a cereal mixture suitable for use in infancy and containing an abundance of the B vitamins and iron but not having the undesirable laxative effect of the usual whole-grain cereals. A mixture of farina, oatmeal, and cornmeal, with added wheat germ, dried brewer's yeast, dried alfalfa meal, and bone meal, was devised which met these requirements (Tisdall et al. 1930). Tests carried out on infants showed that it was well tolerated by them even at the age of 4 weeks (Monypenny 1940). Other tests (Snelling 1938) showed that, when fed from the age of 3 months on, it prevented the development of the low hæmoglobin levels that Parsons (1936), in Birmingham, and Mackay and Goodfellow (1931), in London, have shown to be the rule in normal infants aged 3–6 months. In addition, when it was substituted for the usual cereals and breadstuffs in the diets of children of school age, who were living in an institution where the meals were similar to those eaten by low-income families, it led to improved growth. This increase in growth was shown to be only partially due to additional B vitamins present in the cereal. Parallel with the improved growth was an improvement in the hæmoglobin level.

During infancy, when solid foods are being introduced, it is important to add these foods in small quantities and one at a time. The amounts should be kept small until the child has learnt to accept the new food. If he objects violently to the new food, another similar food should be substituted. After a short period the rejected food, preferably prepared in a somewhat different manner, should be offered again. Coaxing, bribing, and forcible feeding should never be tried, since these methods usually lead to the development of feeding problems, though occasionally in an acquiescent child the last method may lead to obesity and eventually to serious emotional problems.

Owing to the introduction of long-extraction flour here in Great Britain during the past war, your citizens are no doubt eating considerably more thiamine than is the average Canadian. If these restrictions are lifted and the demand for white bread again arises, you will face the same problem that we are now facing. The Americans are meeting this difficulty by adding synthetic thiamine, riboflavine, nicotinic acid, and iron to their white flour. This method is not beyond criticism, for some investigators feel that the addition of only three of the B vitamins, rather than all of them, is an unphysiological procedure. During the war a new type of white flour, described as "Canada-approved vitamin-B white flour" was evolved as the result of a coöperative effort between our nutritional research laboratory, the Dominion Department of Agriculture, and some of the milling companies (Tisdall et al. 1941). By making minor changes in the milling techniques much more of the germ and the scutellum round it and some of the bran were incorporated in the flour. The resultant white flour was equivalent to whole-wheat flour in its thiamine content, though it was less well supplied with riboflavine and iron. Since milk is the main source of riboflavine in a well-chosen diet, and since there are many other foods that provide iron, these relative lacks in the new flour were felt to be of no serious consequence. Unfortunately the millers and bakers did not support this innovation wholeheartedly, partly because of their preference for the fortification method in practice in the United States. Consequently this type of flour is not generally available in Canada at present, but its use seems to be based on better physiological and economic principles than is the use of partially fortified white flour.

Cereals or porridges can also add appreciable amounts of thiamine to the diet, and some years ago the thiamine content of the common Canadian cereals were determined in our laboratory (Jackson and Malone 1943). It was found that the best and cheapest cereal was rolled oats, which provided 0·18 mg. of thiamine per oz., which is a generous serving. A fine granular wheat cereal containing wheat germ, or rolled or cracked wheat, was nearly as rich in thiamine (0·15–0·12 mg. per oz.). In contrast to this the fine white granular wheat cereal made exclusively from the endosperm, which we call farina, contained only a sixth as much thiamine as the rolled oats. It was also found that even protracted cooking of the porridge did not reduce its thiamine content.

The pre-cooked cereals, which unfortunately are commonly used in Canada, were also assayed. The best of these were the shredded-wheat products and the b flakes, but they only contained about a third as m thiamine as rolled oats. Corn flakes, the puffed cere and the ready-to-eat cereals made from rice were entir devoid of thiamine. Besides being poor nutritionally these pre-cooked cereals cost from three to seven tir as much per serving as rolled oats.

You would be wise to urge your patients to take serving of a whole-grain cereal daily and, if possible, li once a week. Other foods containing whole-wheat fl should be recommended also. It is an excellent plan incorporate at least a tablespoonful of wheat germ in daily diet. This can be added to cooked cereals, or amounts of 25% to flour which is to be made into muff tea biscuits, &c. When wheat germ is cooked in t way, some 20% of the thiamine is destroyed, but ev after that loss a great deal still remains. A tablespoon of wheat germ contains about 0·3 mg. of thiamine, wh is almost a quarter of the recommended daily amount this vitamin for a child of 12 years.

Thiamine plays many rôles in the body. It is necess for normal growth, though it is not unique in this respe When diets low in this vitamin are eaten, anorexia a intestinal hypotonia often develop. It has also been sho that on such diets the body is unable to metabol carbohydrates completely. Instead of being broken do to carbon dioxide and water, the carbohydrates stop the pyruvic-acid stage. There is evidence that t accumulation of pyruvic acid is harmful, and it is pl that under such conditions the body is wasting some its food. Several investigators have demonstrated clea that people living on low-thiamine diets lack phys energy, are quickly fatigued, and suffer from ment depression and apathy.

Children should not be allowed to sprinkle sugar their breakfast cereal or porridge. Sugar has a hi satiety value and takes the edge off the appetite. It our poorest food, since its only constituent is carb hydrate. Often, when the porridge is generous "sugared," the child refuses the latter part of breakfast, which is much superior to the sugar in fo value.

Milk is a particularly valuable source of ribofla In fact unless a pint of milk is taken daily it is ver difficult to meet our needs for this factor. This vitamin readily destroyed by light; therefore bottles of mil should not be kept in a light place.

VITAMIN A

We very seldom encounter evidence in Toronto of deficiency of vitamin A. In the Hospital for Sic Children during the last 21 years we have had only cases of xerophthalmia. None of these patients wa receiving whole-milk dilutions or whole milk. This what would be expected when one considers the wide an abundant distribution of vitamin A. It is present in th fat of dairy products, liver, kidney, and egg, and it precursor, carotene, is present in outstandingly larg amounts in coloured vegetables and fruits.

Actually we can change only about 40% of the carote that we ingest into vitamin A, but the green and orang vegetables are so rich in this substance that they usuall constitute the major source of our vitamin A. As a genera rule the more orange or green the vegetable, the mor vitamin-A value it has. Carotene is a bright orang substance, but in the green vegetables this colour i masked by the intensely green chlorophyll. It is recommended that two vegetables besides potatoes be eaten daily. The raw and coloured ones are especially valuable.

CALCIUM

Milk provides about 80% of the child's intake of calcium. We are convinced that pasteurisation is necessary render this extremely valuable food safe. In support this claim we can state that we have not had a single of milk-borne infection (including bovine tuber- losis) since 1915 in a child who had lived in the City Toronto and used no milk that has not been pasteur- d (Brown 1943). In the preschool child, who normally ows slowly, a pint of milk a day is usually all that be given with advantage as a beverage. If the mother ows such a child to drink a pint and a half of milk, he often unable to eat sufficient amounts of the other ntial foods. Cooking the milk does not materially ce its food value, but it has the advantage, especially these younger children, of evaporating some of the er and thus rendering it less bulky. High-fat milks, as Jersey milk, often are not well tolerated by dren and lead to digestive upsets. Their use is refore unwise. The advantages of using evaporated -skimmed milk in formulas for newborn and older nts was investigated by Snelling (1943), of our depart- t. This type of feeding was found to give superior lts in many of these infants. The lesser amounts of min A present in this partially skimmed milk are no consequence if the infant is being given fish-liver . It is generally believed that children under the age 12 years retain the maximum of calcium if their intake about 1 g. a day. This is provided by one and a half ts of milk (30 oz.). It seems likely that the rapidly ing older child should receive about 1·5 g. of calcium y. Many of these children do not take that much, ly *because of the appeal of the ubiquitous soft drink,* partly because of the girls' fear of becoming fat. Our -age girls are often short of calcium.

The availability of calcium in spinach has been the ct of two investigations in our laboratory (Tisdall al. 1937, 1938), and in both of these tests, which were ied out on rats, it was found that, when large amounts spinach were fed, the retention of calcium was much ased. This effect is probably due in part to the -acid content of the spinach. It is well known calcium oxalate is insoluble. Other investigators man 1947) have reported similar results. Therefore not wise to use spinach frequently in the diets of ren, since their calcium requirements are high. Beet and chards are also unsuitable. The following greens, h belong to other botanical families are preferable: coli, loose-leaf cabbage, collards, dandelion greens, , mustard greens, turnip tops, watercress, and -leaf lettuce.

DEFICIENCY OF IODINE

In many areas, in both Canada and Great Britain, e is extremely little iodine in either the soil or the ter. Consequently the diets of people living in these as contain very little iodine. Children and pregnant d nursing women living in such areas, especially where calcium content of the water is high, are prone to oid goitre. To prevent this deficiency we recommend use of iodised salt, and experts in this field assure us no untoward effects follow its use. In other words, amount of iodine taken in the salt is not sufficient to se an increase in the symptoms even of a patient who eady has a toxic goitre. In 1947 a bill was introduced the United States House of Representatives designed make the iodisation of table salt compulsory. On our tinent sea foods are not used generously or universally d therefore they do not provide a reliable supply of dine.

CONCLUSIONS

We have obtained no evidence that the average anadian child receiving a diet at all reasonable suffers om a lack of protein. It is usually considered that 15% f the calories supplied should be in the form of protein, d 50% of this protein requirement should be grade-A protein—i.e.. protein obtained from such foods as milk, meat, fish, eggs, and cheese. The requirement of grade-A protein will almost be fulfilled if the child receives 30 oz. of milk daily.

If the child receives 30 oz. of milk daily containing 3·5–4% fat, along with 1 oz. of butter, his fat requirements for normal nutrition will be fulfilled.

We have never found any evidence of a child receiving a diet containing too small a percentage of carbohydrate. The ease with which we obtain purified carbohydrates in the form of sugars and flours explains this. In fact the greatest error which we find today is an excess of purified carbohydrates. In some Canadian diets 30–50% of the calories are in the form of purified flours and sugars, which as a result of their purification are deficient in most of the minerals and vitamins.

It is recommended, whenever possible, that for normal children the daily diet should contain:

(1) About 30 oz. of milk.

(2) One, or preferably two, generous servings of a food rich in vitamin C—e.g., orange or grapefruit or their canned juices, tomato juice, or raw cabbage—and two vegetables besides potato, including coloured or raw vegetables.

(3) One serving of a whole-grain cereal or porridge, preferably with wheat germ added. Only whole-wheat or vitamin-rich white bread should be used.

(4) One serving or more of meat, fish, egg, or fowl; eggs three or four times a week or oftener: liver or kidney once a week.

(5) Iodised salt (this should be used exclusively).

(6) One regular dose of a good source of vitamin D during at least the six colder months of the year.

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SURGERY OF PORTAL HYPERTENSION

AN ACCOUNT OF 16 CASES

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THIS paper records our experience of 16 patients subjected to operation in the hope of relieving the symptoms of portal hypertension, either by constructing venous shunts, or, when the portal obstruction was limited to the splenic vein, by splenectomy alone. Before 1945, isolated attempts had been made by different surgeons to fashion in man communications between portal and systemic veins, usually on the principle of the Eck fistula often used in animals in the study of the metabolism of the liver; but the techniques available were unsuitable and consistently unsuccessful. In 1945, the work of Blakemore and Lord [1] provided a promising method of anastomosing veins and led to a renewal of interest in the surgical treatment of portal hypertension.

The patients included in our series were referred to the wards of one of us (J. R. L.) because of hæmatemesis, ascites, or both; they are conveniently classified as follows:

	No. of cases
Group I: lienorenal venous anastomosis ..	9
Group II: splenectomy (lienorenal venous anastomosis judged impossible)	3
Group III: laparotomy only	1
Group IV: splenectomy for splenic thrombosis	3

GROUP I: LIENORENAL VENOUS ANASTOMOSIS

In each of the 9 cases in which the splenic and renal veins were anastomosed some degree of hepatic cirrhosis was present. In 3 hæmatemesis was the only symptom; in 3 ascites had been present at the beginning of the illness but was absent or minimal when hæmatemesis occurred; and in the remaining 3 both ascites and hæmatemesis were present. One patient has only recently been operated on and is not included in the discussion; 2 died after operation; during the meeting of the Association of Surgeons in Edinburgh in May of this year it was possible to review the remaining 6 cases after postoperative periods ranging from four to twenty-three months, and to present them to our visitors. Though the longest interval is much too short for any estimate of ultimate prognosis, in none of the 6 ha hæmatemesis recurred, though before operation copio and repeated hæmatemesis had occurred in 4, and durin the week or so before operation 2 patients had had thre and two almost fatal hæmorrhages. Moreover, we wer much impressed by the improvement in the gener condition of these patients: all had returned to fu work, sometimes laborious; all had put on weig (in one case 20 lb. in eighteen months); and all felt an looked well. This general improvement was the mo remarkable when it had taken place in patients who ha shown unmistakable evidence of disturbance of hepat function before operation, confirmed by histologic examination of a portion of liver removed at laparotom

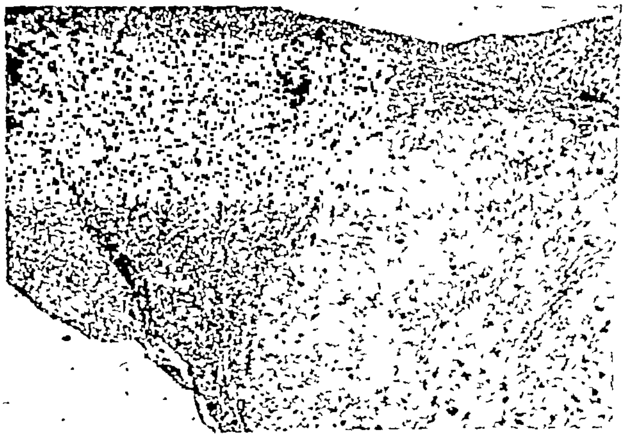

Fig. 1—Section of liver in case 2, showing hepatic fibrosis. (× 33.)

Case 1 (Dr. W. A. Alexander).—A boy, aged 15, wi hepatolienal fibrosis, had had repeated hæmatemesis f 12 months. Well-marked œsophageal varices were pres the spleen weighed 440 g.; the liver showed diffuse cirrho The portal pressure was 320 mm. water. After 23 mont there was no further bleeding. The patient is now on full wo in a distillery and plays football.

Case 2 (Dr. R. D. Lawrence).—A woman, aged 27, had h toxic hepatitis 4 years previously, glycosuria for 3 yea severe hæmatemesis on four occasions in 9 months. La œsophageal varices and gross hepatic fibrosis (fig. 1) we present. The spleen weighed 470 g. The pressure in t splenic vein was 120 mm. water. After 18 months there w no further bleeding. The patient is now on full office a house-work, and has gained 20 lb. in weight.

Case 3 (Prof. L. S. P. Davidson).—A woman, aged 4 with hepatolienal fibrosis had had hæmatemesis for 36 mont Her spleen weighed 180 g., and there was diffuse hepatic fibrosis. After 14 months there was no further bleeding. The patient now does house-work.

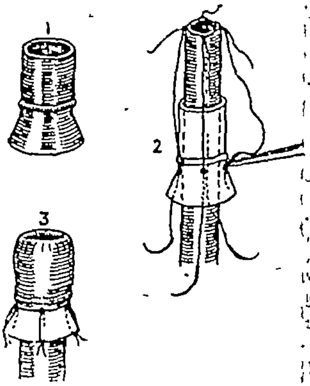

Fig. 2—(1) Vitallium tube with ho bored in flange; (2) and (3) method everting and securing splenic vein ov vitallium tube.

Case 4 (Dr. R. W. D. Turner).—A man, aged 27, who had had hepatitis (? infective) $2\frac{1}{2}$ years previously and hæmatemesis for 18 months. His spleen weighed 940 g., and there was gross hepatic fibrosis. The pressure in the splenic vein was 250 mm. water. After 10 months there was no further bleeding. The patient now does normal work and plays games, except rugb football.

Case 5 (Prof. Charles Wells).—A woman, aged 53, wi hepatolienal fibrosis had had hæmatemesis for 18 month and three copious bleedings while awaiting operation. He spleen weighed 420 g., and she had diffuse hepatic fibrosi After 6 months there was no further bleeding. The patie has returned to office work.

Case 6 (Dr. C. N. Armstrong).—A man, aged 32, had ha infective hepatitis in 1943, and hæmatemesis for 6 mont His spleen weighed 340 g., and he had diffuse hepatic fibrosi After 4 months there was no further bleeding.

Deaths after Operation

Case 7 (Prof. J. W. McNee).—A woman, aged 40, with hepatolienal fibrosis had had ascites and hæmatemesis for 24 months. She had diffuse hepatic fibrosis, and her splee was very adherent and weighed 720 g. She died, without regaining consciousness, 12 hours after operation. Necropsy was not performed.

Case 8 (Mr. R. D. Rowlands).—A man, aged 48, with hepatolienal fibrosis had had ascites and hæmatemesis for 6 month His spleen weighed 240 g., and he had advanced hepati fibrosis. Anastomosis proved difficult. Death took pla

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1. Blakemore, A. H., Lord, J. W. jun. *Ann. Surg.* 1945, 122, 476.

hours after operation, clinically from pulmonary congestion and œdema. Necropsy showed advanced hepatic fibrosis and pulmonary œdema. The anastomosis was patent.

GROUP II: SPLENECTOMY (ANASTOMOSIS JUDGED IMPOSSIBLE)

In this group our intention to perform a lienorenal anastomosis had to be abandoned, usually because the available veins were unsuitable (see below).

Case 9 (Prof. L. S. P. Davidson).—A woman, aged 54, with hepatolienal fibrosis had had hæmatemesis for 24 months, no nephritis. At operation a diffuse hepatic fibrosis was found, and splenectomy was carried out. Her poor condition precluded a lengthy operation. She died 26 days after operation, clinically of progressive hepatic failure. No necropsy was done.

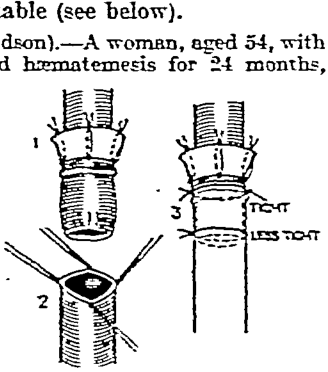

Fig. 3—(1) Splenic vein prepared for anastomosis; (2) stay sutures inserted in renal vein; (3) anastomosis completed.

Case 10 (Dr. A. Rae Gilchrist).—A man, aged [illegible], with hepatolienal fibrosis had had gross ascites for 16 months. Diffuse hepatic fibrosis was found. At splenectomy the splenic veins were found to be in numerous small branches. After 2 months the patient's condition remained unchanged.

Case 11.—A man, aged 29, had had infective hepatitis years previously, and hæmatemesis for 3 months. Diffuse hepatic fibrosis was found. The spleen weighed 490 g. At splenectomy, the splenic artery and vein were found to be in numerous small branches. After 2 months the patient's condition remained unchanged.

GROUP III: LAPAROTOMY ONLY

In one patient, in whom ascites had been present two months, laparotomy only was performed.

Case 12 (Dr. W. A. Alexander).—A woman, aged 23, had had hepatitis 3 years previously. She had extreme cirrhosis and ascites and her condition was judged to be hopeless. She died 28 days after operation, clinically of progressive liver failure. At necropsy there was severe postnecrotic scarring of the liver, and the spleen weighed 350 g.

DISCUSSION OF GROUPS I, II, AND III

Selection of Patients for Operation.—It is necessary to determine by clinical and laboratory examination that the hæmatemesis and ascites are the consequences of hepatic cirrhosis. This investigation includes tests of hepatic function to exclude hypoprothrombinæmia as the cause, or a contributory cause, of hæmatemesis, and to exclude inability of the liver to produce albumin as the cause of ascites. If these deficiencies exist they must be rectified as far as possible by dietetic treatment. We do not recommend liver biopsy by puncture, because in 2 patients, and on two occasions in one of these, the material obtained in this way was normal, though at laparotomy cirrhosis was evident. It must be demonstrated by intravenous pyelography that both kidneys are present, that the function of the right kidney is normal, and that the left kidney is normally situated and not part of a horseshoe kidney.

Operation

Dr. John Gillies, reader in anæsthesia in the University of Edinburgh, induces anæsthesia with thiopentone and maintains it with cyclopropane and oxygen given through a cuffed orotracheal tube, using controlled respiration. As the peritoneum is incised, 15 mg. of d-tubocurarine is given. In our experience at least two hours, and usually longer, is required to complete the procedure. The patient is placed on a gall-bladder rest and tilted towards the right side. A drip transfusion of blood is started before operation.

A diathermy needle is used to divide the posterior leaf of the lienorenal ligament. When the spleen is large and numerous collaterals link it to the abdominal wall, a useful plan is to begin at its lower pole by dividing the gastrosplenic ligament, and to insinuate a pack upwards behind the spleen, where a relatively avascular plane may be found. This pack is worked outwards, until it can be displayed by the diathermy needle, along the convexity of the spleen. When the spleen is mobilised, the vessels in its hilum must be dissected to ascertain their size and disposition. If, as has happened on two occasions, the splenic veins are numerous and small, we now think that it is probably wisest to abandon the operation without splenectomy, and to close the abdomen. In more favourable circumstances the longest and largest, and if possible the lowest, terminal branch of the splenic vein has been chosen for the anastomosis. The splenic artery is divided between ligatures, and the blood in the spleen is returned to the circulation by faradic stimulation of the splenic pedicle distal to the point of division of the artery. The veins are clamped close to the spleen, which is removed. All tributaries joining the vein selected for anastomosis are secured with fine silk as close as possible to the parent vein, and it has usually been necessary to dissect the splenic vein proximally along the upper border of the pancreas for about 10 cm., to add to its length and mobility. When ascites has been present, the tail of the pancreas is swollen and hard, and at this stage it should be opened out by gentle blunt dissection to provide a "straight run" for the splenic vein towards the renal vein; if this is not done, the final anastomosis tends to be angled over the tail of the pancreas.

The splenic vein is next controlled with a rubber-shod bulldog clamp, applied to it in the grasp of curved artery forceps, and moistened with sterile liquid paraffin to prevent it from adhering to the vein. Four fine black silk sutures are passed through the wall of the vein at equidistant points, brought through a 'Vitallium' tube of suitable size (diameter about 0·7 cm.), and passed through small holes in the flange of the tube so that traction on the threads everts the vein; the threads are tied over the flange (fig. 2). The empty segment of vein is washed out with sterile isotonic sodium citrate solution and laid aside under cover of a swab moistened with the citrate solution.

The incision through the peritoneum of the posterior abdominal wall is next continued downwards over the hilum of the left kidney, where its direction changes towards the median line, to enable the renal pedicle to be brought anteriorly without angulation. The kidney is isolated, and the ureter divided between ligatures. The renal vessels are followed to their entrances into the kidney; if the renal vein is branched, the largest and longest, and if possible the uppermost, branch is chosen. The renal artery is divided between ligatures, the veins are clamped close to the hilum, and the kidney is removed. The renal vein is dissected medially, care being taken to preserve the suprarenal vein, which joins its upper border, and the spermatic or ovarian vein, which joins its lower border. The suprarenal vein is often large, because of its communication, direct or indirect, with the engorged splenic vein. The renal vein is controlled with a bulldog clamp and washed out with citrate solution, and four stay sutures of fine silk are inserted in its open end (fig. 3). These sutures are used to draw the open end of the renal vein over the everted splenic vein supported on its vitallium tube, care being taken not to twist either vein. The anastomosis is completed by tying a medium silk ligature firmly round both veins proximal to the flange on the tube, and a second ligature less tightly near the apex

SURGERY OF PORTAL HYPERTENSION

AN ACCOUNT OF 16 CASES

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This paper records our experience of 16 patients subjected to operation in the hope of relieving the symptoms of portal hypertension, either by constructing venous shunts, or, when the portal obstruction was limited to the splenic vein, by splenectomy alone. Before 1945, isolated attempts had been made by different surgeons to fashion in man communications between portal and systemic veins, usually on the principle of the Eck fistula often used in animals in the study of the metabolism of the liver; but the techniques available were unsuitable and consistently unsuccessful. In 1945, the work of Blakemore and Lord [1] provided a promising method of anastomosing veins and led to a renewal of interest in the surgical treatment of portal hypertension.

The patients included in our series were referred to the wards of one of us (J. R. L.) because of hæmatemesis, ascites, or both; they are conveniently classified as follows:

	No. of cases
Group I: *lienorenal venous anastomosis* ..	9
Group II: splenectomy (lienorenal venous anastomosis judged impossible)	3
Group III: laparotomy only	1
Group IV: splenectomy for splenic thrombosis	3

GROUP I: LIENORENAL VENOUS ANASTOMOSIS

In each of the 9 cases in which the splenic and renal veins were *anastomosed* some degree of hepatic cirrhosis was present. In 3 hæmatemesis was the only symptom; in 3 ascites had been present at the beginning of the *illness but was absent or minimal* when hæmatemesis occurred; and in the remaining 3 both ascites and hæmatemesis were present. One patient has only recently been operated on and is not included in the discussion; 2 died after operation; during the meeting of the Association of Surgeons in Edinburgh in May of this year it was possible to review the remaining 6 cases after postoperative periods ranging from four to twenty-three months, and to present them to our visitors. Though the *longest interval* is much *too* short for any estimate of ultimate prognosis, in none of the 6 ha hæmatemesis recurred, though before operation copio and repeated hæmatemesis had occurred in 4, and duri the week or so before *operation* 2 patients had had thre and two almost fatal hæmorrhages. Moreover, we we much impressed by the improvement in the gener condition of these patients: all had returned to fu work, sometimes laborious; all had put on weig (in one case 20 lb. in eighteen months); and all felt a looked well. This general improvement was the mo remarkable when it had taken place in patients who h shown unmistakable evidence of disturbance of hepat function before operation, confirmed by histologic examination of a portion of liver removed at laparotom

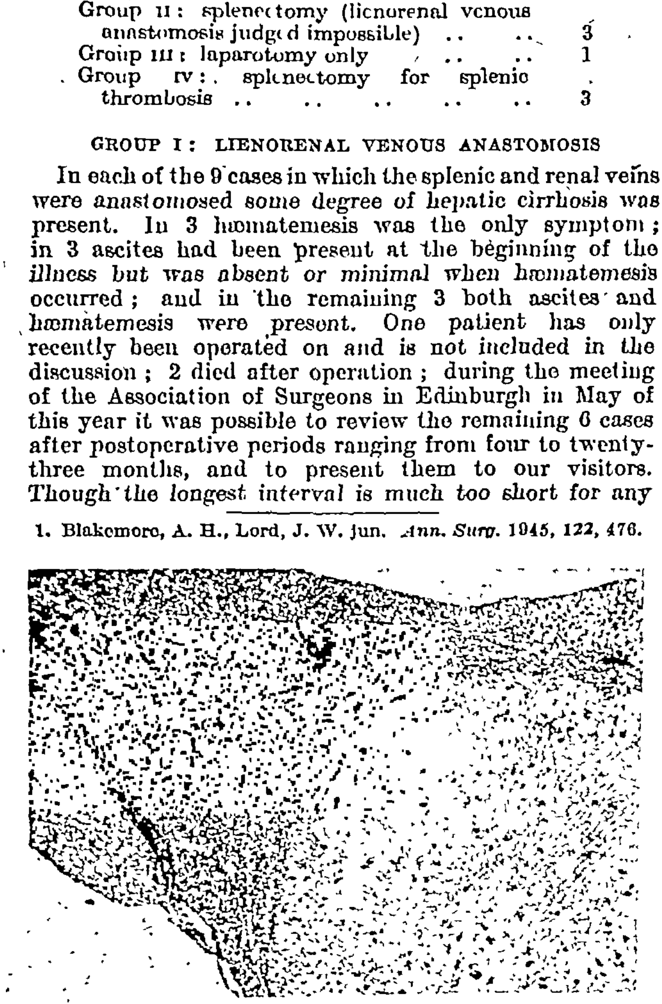

Fig. 1—Section of liver in case 2, showing hepatic fibrosis. (× 33.)

Case 1 (*Dr. W. A. Alexander*).—*A boy, aged* 10, w hepatolienal fibrosis, had had repeated hæmatemesis f 12 months. Well-marked œsophageal varices were pres the spleen weighed 440 g.; the liver showed diffuse cirrho The portal pressure was 320 mm. water. After 23 mon there was no further bleeding. The patient is now on full wo in a distillery and plays football.

Case 2 (Dr. R. D. Lawrence).—A woman, aged 27, had h toxic hepatitis 4 years previously, glycosuria for 3 yea severe hæmatemesis on four occasions in 9 months. La œsophageal varices and gross hepatic fibrosis (fig. 1) w present. *The spleen weighed* 470 *g. The pressure in* t splenic vein was 120 mm. water. After 18 months there wa no *further bleeding. The patient* is now on full office a house-work, *and has gained* 20 lb. in weight.

Case 3 (*Prof. L. S. P. Davidson*).—A woman, aged with hepatolienal fibrosis had had hæmatemesis for 36 mon Her spleen weighed 180 g., and there was diffuse hepatic fibrosis. *After 14 months there* was no further bleeding. The patient now does house-work.

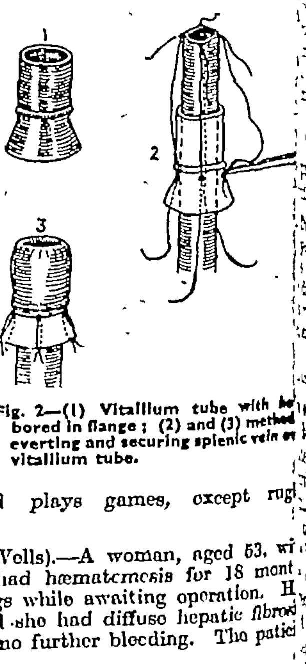

Fig. 2—(1) Vitallium tube with h bored in flange; (2) and (3) method everting and securing splenic vein on vitallium tube.

Case 4 (Dr. R. W. D. Turner).—A man, aged 27, who had had hepatitis (? infective) $2^{1}/_{2}$ years previously and hæmatemesis for 18 months. His spleen weighed 940 g., and there was gross hepatic fibrosis. The pressure in the splenic vein was 250 mm. water. After 10 months there was no further bleeding. The patient now does *normal* work and *plays games*, except rug football.

Case 5 (Prof. Charles Wells).—A woman, aged 53, wi hepatolienal fibrosis had had hæmatemesis for 18 mont and three copious bleedings while awaiting operation. H spleen weighed 420 g., and she had diffuse hepatic *fibro* *After 6 months* there was no further bleeding. The patie has returned to office work.

Case 6 (Dr. C. N. Armstrong).—A man, aged 32, had h *infective hepatitis in 1943, and hæmatemesis* for 6 month His spleen weighed 340 g., and he had diffuse hepatic fibro After 4 months there was no further bleeding.

Deaths after Operation

Case 7 (Prof. J. W. McNee).—A woman, aged 40, wi hepatolienal fibrosis had had *ascites* and hæmatemesis *fo* 24 months. She had *diffuse hepatic* fibrosis, and her splee was very adherent and weighed 720 g. She died, withou regaining consciousness, 12 hours after operation. Necrops was not performed.

Case 8 (Mr. R. D. Rowlands).—A man, aged 48, with hepato lienal fibrosis had had ascites and hæmatemesis *for 6 month* *His spleen weighed 240 g.*, and he had advanced hepati fibrosis. Anastomosis proved difficult. Death took pla

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[1] Blakemore, A. H., Lord, J. W. jun. *Ann. Surg.* 1945, 122, 476.

GROUP IV: SPLENECTOMY FOR SPLENIC VENOUS THROMBOSIS

In this group of cases the obstruction to the portal circulation is in the splenic vein, and the presenting symptom is hæmatemesis, the hæmorrhage being from grossly dilated collaterals about the cardia which connect the vasa brevia to the systemic circulation and to the left gastric vein (fig. 5B). In our experience the liver has been normal and ascites absent; the history has been characteristically episodic, incidents of bleeding, beginning even in infancy, being separated by long intervals of health. Splenomegaly is the rule.

Case 13 (Prof. L. S. P. Davidson).—A girl, aged 16, had had three episodes of hæmatemesis between the ages of 6 and 16 years. Her spleen weighed 400 g., and her liver was normal histologically. The pressure in the splenic vein was 200 mm. water. The collaterals at the cardia were enormous. After 17 months the patient was on full work on a farm.

Case 14 (Dr. Ian Gordon).—A girl, aged 6 years, had had several episodes of hæmatemesis in two years. Her spleen weighed 340 g., and her liver was histologically normal. The pressure in the splenic vein was 190 mm. water. After 8 months there was no further bleeding.

Case 15 (Dr. D. N. Nicholson).—A girl, aged 9 years, had had several episodes of hæmatemesis in two years. Her spleen was much enlarged, and her liver macroscopically normal. The pressure in the splenic vein was 140 mm. water. After 6 months there was no further bleeding, and the patient was very well.

DISCUSSION OF GROUP IV

Operation.—Splenectomy alone is required. Great care is necessary in mobilising the upper pole of the spleen, where we have seen the dilated collaterals hanging like a bunch of black grapes. All vessels in the splenic pedicle should be secured as close to the spleen as possible, to avoid the communications between the splenic vein(s) and diaphragmatic, œsophageal, and pancreatic collaterals.

Results.—In this small series the immediate results have been uniformly good.

SUMMARY

In 16 cases we had an opportunity of treating the effects of portal hypertension by surgical measures. It is emphasised that the series is small, the intervals since operation are short, and the methods used are restricted.

In 6 of 8 patients who survived lienorenal anastomosis there has been no further hæmatemesis after intervals varying from four to twenty-three months, and their general condition has been much improved.

In 3 patients suffering from hæmatemesis due to thrombosis of the splenic vein splenectomy has been a safe and so far satisfactory immediate method of treatment.

J. R. L. is greatly indebted to those colleagues in Edinburgh and elsewhere who entrusted these patients to his care.

"... There is no end to the fears initiated by trifles, but they are not necessarily trifling fears. . . . Again and again patients discharged from hospital, when asked what the doctors have told them, say, 'Oh, they didn't tell me anything.' Often they have spent long periods in the ward and been elaborately investigated, all the time waiting and wondering and uninformed. Could anything be more conducive to the initiation or aggravation of anxiety than experience of this kind? Probably the divided responsibilities which obtain in institutions and the inexperience of house-officers are partly to blame, but the mechanistic, objective character of modern investigations also tends to distract the doctor's from the patient's thought and to direct attention away from private sensibilities and present needs. I have even watched air-raid victims being admitted, examined, X-rayed and transfused without a word of comfort or reassurance being given to them by those concerned. . . ."—Prof. J. A. RYLE, *J. ment. Sci.*, January, 1948, p. 11.

HÆMOPHILUS INFLUENZÆ MENINGITIS

FOUR CASES TREATED WITH STREPTOMYCIN

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THE rarity and highly variable clinical course of *Hæmophilus influenzæ* meningitis render difficult the statistical evaluation of any new form of treatment. Reports from the United States (National Research Council 1946, Alexander et al. 1946, Alexander and Leidy 1947b) show that, although many cases can be cured with streptomycin alone, resistance to this remedy may prevent success. In the review by Wilson (1948) of 43 cases treated in this country 7 of the 9 failures reported appeared to be attributable to drug resistance. Of these same 43 cases 12 have been fully reported by Smythe (1948). A further 4 are reported here.

The dosage used was that recommended by the Medical Research Council committee—i.e., six daily intramuscular injections of 20 mg. of streptomycin per lb. of body-weight, together with an initial intrathecal dose of 50 mg. followed by 25 mg. daily. This dosage was continued until the cerebrospinal fluid (C.S.F.) had been sterile for at least seven consecutive days. Streptomycin hydrochloride (Merck) batch no. 565 was used throughout. All solutions for injection were prepared in sterile physiological saline solution. Each intramuscular dose was contained in 1 ml.; the daily intrathecal dose for cases 1, 2, and 3 was contained in 5 ml., and for case 4 in 2·5 ml. No local or generalised toxic effects from streptomycin were observed.

CASE-RECORDS

Though the 4 patients were all admitted to Addenbrooke's Hospital within the short space of seven weeks, they were otherwise unconnected, coming from widely separated districts of East Anglia. None had a history of recent contact with any case of infection of the upper respiratory tract. The cases are summarised in table I.

Case 1.—A boy, aged 21 months. Apart from a cold on the chest for the previous fortnight he had appeared well until Oct. 13, 1947, when he cried and vomited on waking after his siesta. In the evening he seemed dazed, did not recognise his mother, and vomited several times more. Though better next day, he had some neck stiffness on Oct. 15 and vomited frequently. He was admitted to the local hospital, where the C.S.F. was examined and *H. influenzæ* meningitis was provisionally diagnosed. Penicillin 20,000 units intrathecally and 10,000 units intramuscularly, and sulphadiazine 0·5 g. by mouth, were given, and that evening he was transferred to Addenbrooke's Hospital.

Examination on Admission.—He was desperately ill, comatose, flushed, and dehydrated, with temperature 101°F, intense inflammatory œdema of both lids, proptosis apparently beginning, fixed external strabismus, almost inactive pupils, neck rigidity, absent limb and abdominal reflexes, inflamed tonsils, and a blister on the left tympanic membrane. The C.S.F. was purulent and contained gram-negative bacilli; *H. influenzæ* Pittman type B was isolated.

Treatment and Progress.—The standard course of streptomycin was started immediately and continued for ten days (total 275 mg. intrathecally and 4560 mg. intramuscularly). After fifteen hours the œdema of the lids began to regress, and two hours later he was apparently able to see. Next day he could hear, and that afternoon he sat up and started playing. When streptomycin therapy stopped on the tenth day, the temperature had been normal for four days. He was kept under observation a further fourteen days before discharge.

of the tube, to prevent separation of the intimal coats of the veins by a layer of blood (fig. 3). The bulldog clamp on the renal vein is first removed, then that on the splenic vein; we have usually been able to confirm the direction of blood-flow from splenic to renal vein (fig. 4). It is possible to construct the anastomosis by circular phleborrhaphy (case 4), but it is our impression that the vitallium tube acts as a useful splint, especially when the two veins do not lie quite in the same plane. The area of operation is reperitonealised by suturing the lateral edge of the incision in the lienorenal ligament, and its continuation over the kidney, to the medial edge of the opening in the gastrosplenic ligament. The abdomen is closed in layers without drainage.

We have had no personal experience of end-to-side lienorenal anastomosis, with preservation of the kidney, or of any other type of portacaval shunt.[2]

After-treatment.—The foot of the bed is raised on blocks for the first twenty-four hours to encourage a rapid flow in the vena cava. After six hours enough heparin is added to the drip to keep the clotting-time at 12–15 min.; after twenty-four hours the heparin is discontinued.

Results

This report, it must be emphasised, is a preliminary one and includes only our small personal experience. Moreover, we are not in a position to compare the results of lienorenal anastomosis with those of other procedures designed to provide portal-systemic shunts, either directly (portacaval anastomosis) or indirectly by increasing the number of collaterals (Talma-Morison operation and its variants). In any large series of cases of portal hypertension, of whatever ætiology, cases will be found to fall into three groups[3]:

(1) An *acute* group, in which the obstruction is rapidly produced or widespread, or hepatic failure is so rapid, that collateral vessels do not form and the condition ends fatall after a short illness. In this group the question of surgic treatment does not arise.

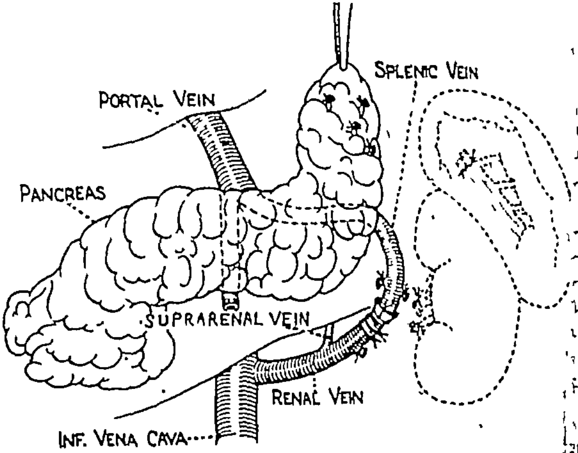

Fig. 4—General arrangement of structures after lienorenal anastomos (after Blakemore and Lord[1]).

(2) An *episodic* group, in which the obstruction is le rapidly produced or less complete. Symptoms and sig abate as the collateral circulation takes over the venous loa and there may be long intervals, measured even in year before an increase in portal obstruction surprises an inadequat collateral circulation and symptoms recur, possibly to di appear again if the collateral circulation can respond to th increased demand on it.

(3) A *chronic* group, in which initial ascites may have be tided over by one or more tappings of the abdomen, hæmatemesis, by one or more blood-transfusions after whic the collateral circulation is sufficient to reduce the increase portal pressure. In this group the anatomical dispositio of the collaterals may be such that, though ascites does n recur, hæmatemesis may be a danger.

The chronic group appears to offer the most promisin indications for lienorenal anastomosis, and indeed—though this may be fortuitous—all our successful cas belonged to it. We canno say with certainty that th anastomosis remains permanently open; in the fata case which came to necrops (case 8) it may be significan that in spite of a failing circulation the anastomos was completely patent afte thirty-two hours. This poin can be clarified only by th examination of the site o operation at necrops after much longer interval Nevertheless, we have bee impressed by the considerable improvement in genera health, including improvement in metabolism a indicated by increase in weight, which has been uniformly found in our small series. It is tempting to hope that, besides dealing with the hæmatemesis (though radiographic evidence of œsophageal varices may persist), we have made a physiological readjustment which has improved hepatic functions though we cannot offer even a tentative explanation of this process.

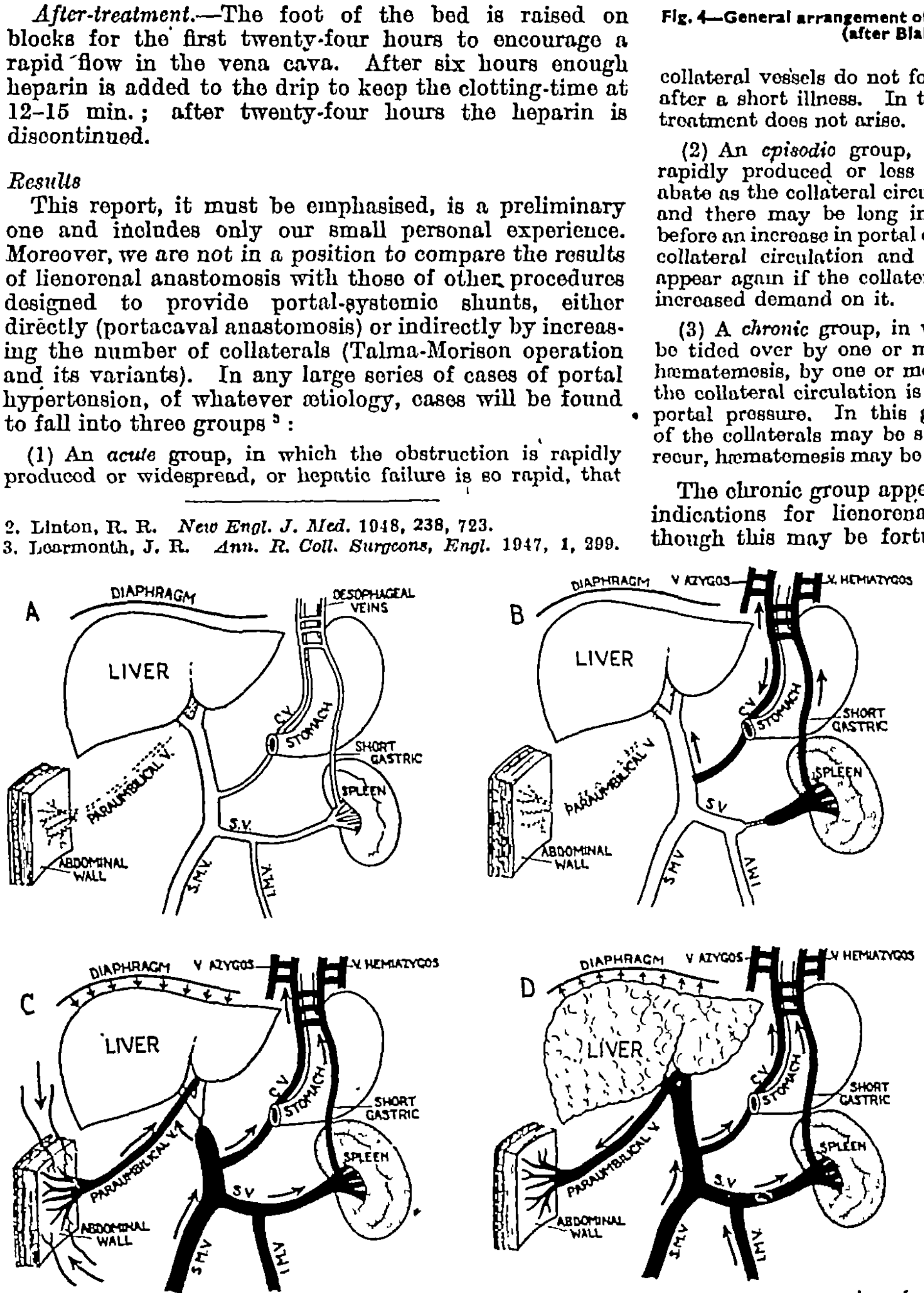

Fig. 5—A, Normal portal circulation; B, circulation in obstruction of splenic vein; C, obstruction of portal vein outside liver; D, Intra-hepatic portal obstruction.

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2. Linton, R. R. *New Engl. J. Med.* 1948, 238, 723.
3. Learmonth, J. R. *Ann. R. Coll. Surgeons, Engl.* 1947, 1, 299.

TABLE II—SENSITIVITY OF *H. influenzæ* TO STREPTOMYCIN, PENICILLIN, AND SULPHATHIAZOLE

Case	Source	Relation to specific therapy	Minimal inhibiting dose		
			Streptomycin (μg. per ml.)	Penicillin (i.u. per ml.)	Sulphathiazole (mg. per ml.)
1	C.S.F.	On admission	4	1	4
		Streptomycin 2nd day	2	1	4
2	Nasopharynx	On admission	2	4	2
	C.S.F.	Relapse after penicillin and sulphadiazine	2	4	4
3	C.S.F.	On admission	2	1	4
4	C.S.F.	On admission	2	1	4
	,,	Streptomycin 1st day	4	..	..
	,,	Streptomycin 2nd day	4	..	..
	,,	Streptomycin 14th day (streptomycin stopped)	1000	..	..
	Ventricular fluid	Penicillin and sulphamezathine 11th day	1000	1	4
	,, ,,	,, ,, ,, 18th day	1000	1	4
	,, ,,	Necropsy on 43rd day (no specific therapy for 10 days)	1000	..	..

ed. However, though the streptomycin level had as high as 37 μg per ml. by the twelfth day, there was no evidence of spinal block.

On the fourteenth day *H. influenzæ* was again grown from C.S.F., and this strain was shown to be highly resistant to ptomycin. Streptomycin therapy was accordingly aban- d, and penicillin (to a total of 5,990,000 units in twenty s and 'Sulphamezathine' to a total of 31 g. in fourteen) were given instead. Next day lumbar puncture which been becoming increasingly difficult, could not be done. the nineteenth day opisthotonos was again so severe that ventricular taps were performed for three days. These mens of ventricular fluid were sterile. There was no l improvement, and vomiting continued. On the y-fifth and thirty-second days *H. influenzæ* was isolated the ventricular fluid. The child eventually died on 11, forty-three days after admission.

act *from Laboratory Findings.*—On admission: C.S.F. cells per c.mm.; C.S.F. protein 180 mg. per 100 ml., C.S.F. e *H. influenzæ*; blood-culture not done; nose and throat s negative. Second day: C.S.F. cells 11,500, protein ulture *H. influenzæ*. Third day: C.S.F. cells clotted, *H. influenzæ*; blood-culture sterile. Fourth day: lls 835, protein 100, sugar 18 mg. per 100 ml., culture Eighth day: C.S.F. cells 245, protein 100, sugar 32, sterile. Thirteenth day: C.S.F. cells 145, protein ar 47, culture sterile. Fourteenth day: C.S.F. cells protein 70, sugar 1, culture *H. influenzæ*. (Penicillin and mezathine substituted for streptomycin.) Nineteenth : C.S.F. (right ventricle) cells 2000, culture sterile; blood- re sterile. Twentieth day: C.S.F. (left ventricle) cells protein 140, culture sterile. Twenty-fifth day: C.S.F. (left ricle) cells 430, protein 200, sugar 1, culture *H. influenzæ*. phamezathine stopped.) Thirty-second day: C.S.F. (right ricle) cells 2400, protein 300, sugar 20, culture *H. influenzæ*. cillin stopped.) Forty-third day (post mortem): C.S.F. t ventricle) cells 970, culture *H. influenzæ*.

cropsy Findings.—There was a purulent leptomeningitis h pyocephalus and a thrombosis of the left lateral sinus. ventricular system was enormously dilated, with reduction thickness of the brain substance everywhere. The cisterna na was bounded by greatly thickened meninges, and it obvious that the foramina had been occluded; they could longer be identified. The subarachnoid space throughout length of the spinal canal was filled with inflammatory date, which in the cervical region had become organised. ological changes in the nervous tissue were relatively t considering the severity of the meningitis. There e no other significant abnormalities and no additional of infection, such as pneumonia, sinusitis, or mastoiditis. pure culture of a strain of *H. influenzæ* resistant to strepto- in was obtained from the purulent ventricular fluid.

BACTERIOLOGY

All strains of *H. influenzæ* isolated from these cases ew readily on 10% (horse blood) chocolate agar, were dole-positive, and required X and V factors for growth 1% peptone agar. They were all Pittman type-B rains.

Bacterial Sensitivity.—The in-vitro minimum inhibitory e of an antibiotic varies not only with the species of organism under test but also with the size of the inoculum and the constitution of the substrate used. Therefore, to ensure comparable results, a constant technique [*] using a standard inoculum and the same batch of culture medium was used for all tests of sensitivity to streptomycin, penicillin, and sulphathiazole. The results obtained with 12 strains of *H. influenzæ* isolated from these cases at various stages of treatment are summarised in table II.

STREPTOMYCIN LEVELS

Daily estimations of the streptomycin level in the C.S.F. twenty-four hours after the intrathecal injection of streptomycin, and single observations on the serum-streptomycin level one and four hours after an intramuscular injection were carried out in each of these cases. The technique suggested by the Medical Research Council (M.R.C. 47/241, May 8, 1947) was used in cases 1, 2, and 3, and Mitchison's method (M.R.C. 47/503. Revised 10/47) in case 4. The streptomycin levels in the C.S.F. are summarised in table I. The serum-streptomycin levels in cases 1, 2, 3, and 4, estimated at one and four hours after an intramuscular injection of streptomycin, were 16 and 8, 4 and 2, 8 and 4, and 4 and 2 μg per ml. respectively.

DISCUSSION

The cases described provide a good illustration of both the success and failure of streptomycin in the treatment of *H. influenzæ* meningitis.

The most impressive response to streptomycin was seen in case 1. In fact, the child's condition on admission to Addenbrooke's Hospital was such that without chemotherapy he would probably have died within a few hours, whereas two days later he was sitting up and playing, and his recovery was uneventful and complete.

Case 2 provided a good example of a relapse following an apparently successful course of penicillin and sulphadiazine. This was rapidly controlled by immediate treatment with streptomycin.

In case 3 the minimum course of streptomycin recommended by the Medical Research Council was extended by two days, because the temperature had remained normal for only forty-eight hours before the seventh daily consecutive sterile specimen of C.S.F. was obtained. Apart from this slight prolongation of pyrexia the clinical response in this case was also entirely satisfactory.

The initial response to streptomycin in case 4 was again satisfactory, though not so impressive as in the other three cases. Though the C.S.F. was sterile by the third day of treatment and remained so for the next

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[*] *Sensitivity tests.* 0·25 ml. of an 18-hour culture, in 2·5% Fildes's (horse blood) digest broth, of the organism to be tested was inoculated into 10 ml. of the same medium and 0·5 ml. of this added, immediately, to each tube of a twofold serial dilution of streptomycin, penicillin, or sodium sulphathiazole in similar amounts of 0·85% NaCl. The minimum inhibitory dose was taken to be the least amount of the drug in which there was no visible growth after 48 hours' incubation at 37°C.

Six months later his doctor reported him completely normal for his age.

Extract from Laboratory Findings.—On admission: C.S.F., 23,000 cells per c.mm.; C.S.F. protein 90 mg. per 100 ml.; C.S.F. culture, blood-culture, and nose and throat swabs, *H. influenzæ*. Second day: C.S.F. culture sterile. Third day: C.S.F. culture *H. influenzæ*; blood-culture and nose and throat swabs negative. Fourth day: C.S.F. culture sterile. Fifth day: C.S.F. cells 230, protein 70, culture sterile. Tenth day: C.S.F. cells 35, protein 50, culture sterile. (Streptomycin treatment stopped.) On discharge: C.S.F. cells 35; protein 30; culture sterile.

Case 2.—A boy, aged 3 years 3 months. On Oct. 23, 1947, he vomited, and he continued vomiting all night. Next day he seemed better, and was apyrexial, and no abnormal signs were found. On Oct. 25 he would not play or talk and seemed only semiconscious. His temperature was 99°F and he had neck stiffness. At the local hospital lumbar puncture revealed a turbid C.S.F. under pressure. Penicillin 100,000 units followed by 50,000 units intramuscularly, and sulphapyridine 1·5 g., 1·0 g., then 0·25 g. were given three-hourly for forty-five hours. On Oct. 27 the growth of *H. influenzæ* was reported from the original C.S.F., and he was transferred to Addenbrooke's Hospital.

Examination and Initial Treatment.—The child did not seem very ill. Though he had slight neck rigidity and the right ankle and abdominal reflexes were absent, he was fully conscious and afebrile. No organisms were seen in the stained films from the C.S.F., and the subsequent culture was sterile. As he had apparently responded so well already, he was not considered suitable for the clinical trial of streptomycin; therefore the original treatment was continued, but the penicillin was given in doses of 25,000 units four-hourly, and sulphadiazine 1·5 g. followed by 0·75 g. four-hourly was substituted for sulphapyridine for six and a half days. The neck rigidity had almost disappeared by Oct. 29. The temperature remained normal and the patient played happily. On Nov. 7, while playing in his cot, he fell out on to his head. No abnormal physical signs were detected and radiography of his skull showed no fracture. Next day he complained of headache and was found to have a temperature of 100°F, absent lower limb reflexes, and neck rigidity. A turbid C.S.F. contained gram-negative bacilli, and *H. influenzæ* Pittman type B was isolated.

Streptomycin Treatment and Progress.—The standard course of streptomycin was started at once and continued for eight days. The total given was 225 mg. intrathecally and 4700 mg. intramuscularly. Clinical improvement was obvious after nineteen hours; the temperature settled within twenty-four hours, and the child made an uninterrupted recovery. He was kept under observation for thirteen days after streptomycin had been stopped. A full examination three months later confirmed his complete recovery.

Extract from Laboratory Findings.—On admission: C.S.F. cells 230 per c.mm.; C.S.F. protein 30 mg. per 100 ml.; C.S.F. culture, blood-culture, and nose swab, negative; throat swab *H. influenzæ* (negative five days later). Relapse: C.S.F. cells 725, protein 40, culture *H. influenzæ*. Second day: C.S.F. cells 3000; culture sterile. Third day: C.S.F. cells 185, culture sterile. Fifth day: C.S.F. cells 20, protein 30, culture sterile. Eighth day: C.S.F. cells 12, protein 25, culture sterile. (Streptomycin treatment stopped.) On discharge: C.S.F. cells 7, protein 25, culture sterile.

Case 3.—*A boy, aged 1 year 11 months*, had been poorly since Nov. 11, 1947, when he vomited twice and had a temperature of 103°F. During the next six days his temperature remained raised. At times he seemed dazed and he gradually developed head retraction. On Nov. 17 he was admitted to the local hospital with tonsillitis. Next day he had definite neck rigidity, the C.S.F. was cloudy and under pressure, and *H. influenzæ* was subsequently isolated. Penicillin 800 units intrathecally and sulphadiazine 0·5 g. four hourly to a total of 3 g. were given. On Nov. 19 he was transferred to Addenbrooke's Hospital.

Examination.—The child was obviously ill and apathetic with temperature 103°F, well-marked neck rigidity, absent abdominal reflexes, and much inflamed tonsils. A turbid C.S.F. contained gram-negative bacilli; *H. influenzæ* Pittman type B was isolated.

Treatment and Progress.—The standard course of streptomycin was started at once and continued for ten days, 275 mg. being given intrathecally and 6200 mg. intramuscularly. Within forty-eight hours he was sitting up and playing and recovery was uneventful. He was kept under observation for eleven days after treatment ceased. Three months later he was reported by his doctor to be normal in every way.

Extract from Laboratory Findings.—On admission: C.S.F. cells 300 per c.mm.; C.S.F. protein 40 mg. per 100 ml.; C.S.F. culture *H. influenzæ*; blood-culture and nose and throat swabs negative. Second day: C.S.F. cells 320, protein 40, culture sterile. Fifth day: C.S.F. cells 55, protein 4 culture sterile. Tenth day: C.S.F. cells 20, protein 4 culture sterile. (Streptomycin treatment stopped.) On discharge: C.S.F. cells 9, protein 30, culture sterile.

Case 4.—A boy aged 7 months had been fully breast-fed and weaning had just been started. His parents described him as perfectly well until Nov. 23, 1947, when he had vomited several times, stared vacantly at the light, and begun jerking movements of the limbs. These continued for seven days and "his head gradually arched further and further backwards." In the evening of Nov. 29 he was admitted to Addenbrooke's Hospital with a provisional diagnosis of tuberculous meningitis.

Examination.—He was comatose and in well-marked opisthotonos, with spastic limbs and increased briskness of tendon reflexes. His temperature was 104°F. A turbid C.S.F. contained gram-negative bacilli; *H. influenzæ* Pittman type B was isolated.

Treatment and Progress.—The standard course of streptomycin was started at once: 395 mg. was given intrathecally in fourteen days and 6675 mg. intramuscularly in fifteen days. Clinical response was definite but somewhat slow. By the eighth day of treatment the temperature had settled. On the tenth day he was smiling responsively and showed minimal stiffness of the neck. However, that evening he vomited and continued to do so once or twice daily. On the thirteenth day his temperature started to rise, the neck rigidity returned, he was fretful, and the vomiting continued. During this time the C.S.F., though sterile, never contained less than 150 cells per c.mm. and the amount of protein remained

TABLE I—SUMMARY OF CASES

Case no.	Sex	Age	Days ill before start of streptomycin	Intramuscular streptomycin (mg. daily × no. of days)	Intrathecal streptomycin (mg. daily × no. of days)	Average range of C.S.F. streptomycin level (µg. per ml.)	Days from admission on which C.S.F. culture positive	Sensitivity of organism to streptomycin (µg. per ml.)	Clinical severity	Result
1	M	1 yr. 9 mos.	2	480 × 10	50 × 1 25 × 9	1–8	1 3	4 2	Fulminating	Complete recovery
2	M	3 yr. 3 mos.	17	600 × 8	50 × 1 25 × 7	1–2	13*	2	Mild	Complete recovery
3	M	1 yr. 11 mos.	9	600 × 10	50 × 1 25 × 9	1–2	1	2	Moderate–severe	Complete recovery
4	M	7 mos.	7	450 × 15	50 × 1 25 × 13	1–37	1 2 3 14 25 32 43 (p.m.)	2 4 4 1000 1000 1000 1000	Severe	Died

* On admission C.S.F. sterile; no streptomycin given until relapse 13 days later.

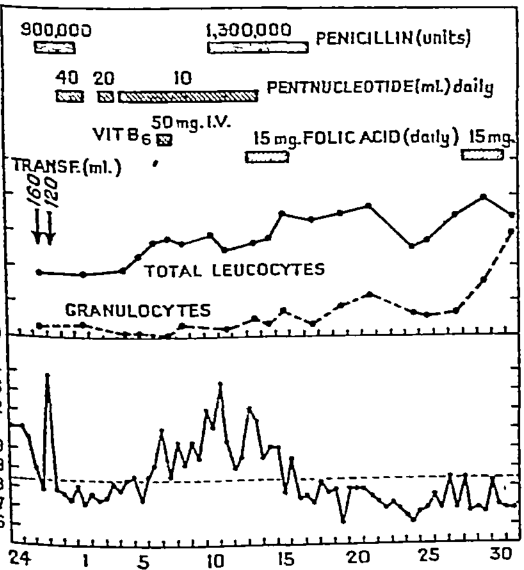
nulocytes varying from 0 to 13%. On March 14, when e white-cell count was 2700 per c.mm. (segmented 7%, ab 6%) treatment with folic acid was begun, 5 mg. i.d. being given for three days. On March 15 the white numbered 2800 per c.mm., and on the 16th 3500 per m. (segmented 10%, stab 4%, metamyelocytes 6%, h now appeared for the first time in the blood films). e temperature became normal on March 17, and the stomal er began to heal two days later. The white-cell count mained at 3500 per c.mm., with a temporary drop to 2500 c.mm. (segmented 16%, stab 8%) on March 24. On rch 25 the white cells numbered 2700 per c.mm. (segmented ., stab 1%, basophils 1%). On March 27 they numbered per c.mm. (segmented 12%, stab 3%).

Sternal puncture on March 27 revealed a few nucleated ls with 12% granulocytes. A further course of folic acid g. t.i.d. was given from March 28 to 30. On March 29 white cells numbered 3900 per c.mm. (segmented 28%, 10%); on the 31st 5000 per c.mm. (segmented 50%, stab , metamyelocytes 1%).

The patient was discharged on April 10 and received further isyphilitic treatment (penicillin 4,000,000 units and uth 0·98 g. in June, and penicillin 4,000,000 units bismuth 1·35 g. in September) without any effect on the -cell count, which remained above 5000 per c.mm. anulocytes over 50%) up to December, 1947.

Case 2.—A woman, aged 49, under treatment from Feb. 3 12, 1947, for cystopyelitis, received sulphathiazole 18 g. four days. On Feb. 4 her white cells numbered 4200 per m. (segmented 83%, stab 2%, lymphocytes 15%). On 17 she became acutely ill with fever, headache, vomiting, h, and dysuria. On Feb. 20 she was readmitted to hos- with a diagnosis of central pneumonia and periostitis t femur.

e patient was given sulphathiazole to a total dosage of from Feb. 21 to March 1. She had a swinging tempera- up to 102·2°F for two days. The temperature then e normal but rose again to 99·7°F on March 2. Since g did not improve, a course of penicillin 20,000 units -hourly was started. On March 3 a blood-count showed e granulocytopenia: red cells 3,400,000 per c.mm., 70%, and white cells 1500 per c.mm. (segmented 16%, ils 1%). Platelets increased in number. During the n days the patient received, in addition to the n (which was continued throughout), ascorbic acid g. daily, pentnucleotide 20 ml. daily for three pyridoxine 50 mg. intravenously on one day, and blood-transfusions totalling 540 ml. Daily blood- s showed white cells 1300–1800 per c.mm. with only nal granulocytes (stab 0–2% and an occasional baso-). Throughout the illness the mouth and throat remained healthy. On March 13, after a transfusion of 160 ml., the white-cell count had risen to 2700 per c.mm. (segmented 0%, stab 2%, eosinophils 2%, basophils 2%, plasma cells 3%, monocytes 2%, lymphocytes 89%).



1—Treatment, temperature, and white-cell counts in case 1 (treated with folic acid).

A sternal-marrow film on March 13 showed only 10,300 nucleated cells, with 5% cells of the myeloid series (segmented 0·5%, promyelocytes 1·5%, myeloblasts 1%, basophils 1%). Hardly any cells were more mature than promyelocytes. Apart from a large number of cells of the erythroblastic series (34%) and an increased number of lymphocytes (41%) there were also an increased number of plasma cells (7·5%). Megakaryocytes were numerous.

From March 13 to 15 the patient was given folic acid 5 mg. t.i.d. The white-cell count dropped to 2100 per c.mm. on March 14 and 1800 per c.mm. on the 15th, but on the 17th there was a sudden rise to 2700 per c.mm. (segmented 16%, stab 8%). On this day the temperature became normal. On March 19 the white cells numbered 5500 per c.mm. (segmented 44%, stab 14%, metamyelocytes 1%, myelocytes 3%). On March 21 they numbered 10,500 per c.mm., with a similar differential count. Subsequently the blood-counts remained normal, except for a temporary slight leucocytosis while the patient had a septic tonsillitis and a gluteal abscess.

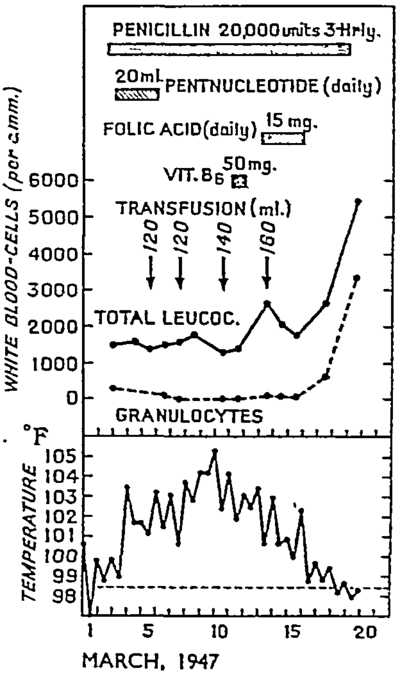


Fig. 2—Treatment, temperature, and white-cell counts in case 2 (treated with folic acid).

These 2 cases improved shortly after the administration of folic acid, suggesting that folic acid is of value in treatment of agranulocytosis. However, cases 3, 4, and 5 improved equally rapidly without folic acid.

Case 3.—A man, aged 34, developed agranulocytosis after twelve weeks' treatment of toxic goitre with methyl thiouracil (total 21·8 g.). His lowest white-cell count was 600 per c.mm. (granulocytes 0%). A blood-count and a sternal-marrow count made only two days after the discovery of the agranulocytosis already showed recovery of the bone-marrow. The blood-count showed red cells 4,320,000 per c.mm., Hb 95%, white cells 9100 per c.mm., granulocytes 47% (segmented 21%, stab 10%, metamyelocytes 6%, myelocytes 7%, disintegrating granulocytes 3%), platelets normal. The sternal puncture showed nucleated cells 34,800 per c.mm., the ratio of myeloid cells to erythroblasts being 13·5 : 1, and 81% granulocytes with increase of young forms and mitosis.

Case 4.—A woman, aged 56, developed agranulocytosis after taking tablets containing acetylsalicylic acid, amidopyrine, 'Novatophan,' 0·3 g. of each, and codeine phosphate 0·1 g. thrice daily for about three weeks. Blood-counts and sternal-marrow counts showed recovery in three days. On July 11, 1947, a blood-count showed red cells 5,110,000 per c.mm., Hb 90%, white cells 2100 per c.mm. (granulocytes 2%), platelets normal, and a sternal-marrow count showed nucleated cells 9500 per c.mm. (promyelocytes 27%, myeloblasts 11%, no mature granulocytes). Next day there was already a slight improvement, the white cells numbering 3700 per c.mm. (granulocytes 11%, stab 4%, metamyelocytes 2%, promyelocytes 2%, myeloblasts 3%). On the 14th white cells numbered 15,200 per c.mm. and granulocytes 77% (segmented 29%, stab 22%, metamyelocytes 22%.

nine days, clinical improvement was rather slow. Next day there was a relapse, coinciding with the isolation of a *highly resistant strain* of *H. influenzæ* from the C.S.F. Despite immediate substitution of full dosage of penicillin and sulphamezathine for streptomycin, and the periodic relief of intraventricular pressure by tapping, the child went steadily downhill and died on the forty-third day. All strains isolated after this relapse also showed the same high degree of resistance to streptomycin. On the other hand, the subsequent failure of a combined course of penicillin and sulphamezathine was not reflected by any decrease in sensitivity to these drugs. The strain isolated from case 2 after the apparently successful course of penicillin and sulphadiazine also showed no appreciable increase in resistance to these drugs.

In the past the response of *H. influenzæ* meningitis to treatment with specific antiserum, sulphonamides, or penicillin, either singly or in combination, has usually been somewhat protracted (Alexander 1944, Zinnemann 1946, Gottlieb and Forsyth 1947, Gerrard 1947, Thomson et al. 1947). The outstanding feature of successful streptomycin therapy is the immediate clinical response and rapid control of the infection.

Failure of streptomycin therapy is almost always associated with the development of resistance to streptomycin. Alexander and Leidy (1947a) have presented convincing evidence that in any large population of *H. influenzæ* studied in vitro there is a constant proportion of organisms naturally resistant to streptomycin, and though these resistant variants are only a minute fraction of the total population they constitute a constant potential source of relapses in every case of *H. influenzæ* meningitis treated with streptomycin alone. They are, however, just as sensitive as the parent strains to penicillin and sulphonamides. In cases 1 and 3 penicillin and sulphonamides were given before transfer to Addenbrooke's Hospital, and though this preliminary treatment was insufficient to cause obvious clinical improvement it may have reduced the total number of organisms present, including the naturally resistant variants, before treatment with streptomycin was begun, and thus lessened the risk of relapse later.

Since neither clinical assessment nor the bacteriological examination of the C.S.F. is an accurate guide to the total number of organisms present, there is no reliable way of estimating the chances that resistance to streptomycin will develop during treatment. Further, by the time such a relapse takes place the organisation of the inflammatory exudate may have rendered the residual foci of infection inaccessible to alternative methods of treatment. The failure of penicillin and sulphamezathine to control the relapse in case 4 on the fourteenth day of streptomycin therapy was probably due to this.

Therefore, in spite of some outstanding successes with streptomycin alone, there is already a strong case for the treatment of *H. influenzæ* meningitis with both streptomycin and a sulphonamide from the outset; the possible addition of penicillin and even specific antiserum in the more severe examples of this condition might also be considered.

SUMMARY

Of four children with *H. influenzæ* meningitis treated with streptomycin three showed a rapid response with complete recovery and the fourth died after developing resistance to streptomycin. In view of the tendency to resistance to streptomycin the use of a sulphonamide in combination with streptomycin should be considered.

We wish to thank Professor Sir Lionel Whitby and Dr. F. B. Parsons for access to their cases; Dr. R. Mayon White for assistance with case 4; Dr. A. M. Barrett for the necropsy findings; Dr. A. B. Rosher for the Pittman typing; and the Medical Research Council for supplies of streptomycin.

References at foot of next column

FOLIC ACID IN THE TREATMENT OF AGRANULOCYTOSIS

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Black and Stanbury (1947) have suggested that f acid is of value in the treatment of granulocytope and agranulocytosis due to drugs. The basis of its in this condition is the treatment of leucopenia in nu tional deficiency states as observed in animal experime (Spicer et al. 1942, Welch et al. 1942, Wilson et 1942, Ransone and Elvehjem 1943, Cooperman et 1946, Doan 1946).

Apart from industrial chemicals, many drugs no use may produce agranulocytosis, and it is import to record all available data relating to its treatm The use of penicillin enables us to control infection du the period of agranulocytosis, and if this is done the a tendency to spontaneous recovery in many c (provided the offending drug is discontinued); h it is difficult to assess the effectiveness of other form treatment. In recording cases subjected to sp forms of treatment it is essential to keep in mind possibility of spontaneous remission and to be abl recognise when this is impending. Of the 5 case drug-induced agranulocytosis reported here 2 treated with folic acid.

Case 1.—A woman, aged 47, was admitted to hospi Feb. 24, 1947, with a tentative diagnosis of diphtheria. F Jan. 15 to Feb. 17, she was treated for syphilis, recei nine injections of neoarsphenamine (total 4·65 g.) and el injections of bismuth (total 0·88 g.). During this perio had two febrile attacks accompanied by a scarlatini rash. On Feb. 18 (five days after the last injectio neoarsphenamine and a day after the last bismuth she became acutely ill with headache, high fever, and r she was given 'Pyramidon' 0·3 g. t.i.d. and sulphathi 0·5 g. t.i.d. On Feb. 21 she complained of sore throat.

On admission she had membranous stomatitis and ton with ulceration and *fœtor oris*, and auricular fibrill A blood-count showed leucopenia, with white cells 1800 c.mm. (granulocytes 15%). Serological reactions for syp were strongly positive. Throat-swabs gave on cul Vincent's organisms and *hæmolytic streptococci*, but *C. diphtheriæ* were found.

Treatment.—The patient was given anti-diphtheria se 20,000 units, anti-gas-gangrene serum 15 ml., 'Campolon' 5 and sulphanilamide 1·5 g. on Feb. 24; penicillin 900,000 u from Feb. 26 to March 1; 'Pentnucleotide' 40 ml. on Fe and March 1, and 20 ml. on March 3. Blood-transfusion 160 ml. on Feb. 26 and 120 ml. on Feb. 27 were given.

Progress.—The patient's temperature, which had 101·2°F on admission, became normal in two days. blood-count on March 4 showed red cells 4,790,000 per c.m Hb 101%, white cells 1900 per c.mm., granulocytes (segmented 2%, "stab" 2%), platelets normal, and retic cytes less than 0·5%. From March 4 to 14 the pat received pentnucleotide 10 ml. and ascorbic acid 250 daily; on March 7 she was given pyridoxine 50 mg. in venously. From March 10 to 17 she received penicillin th hourly to a total of 1,300,000 units. Swinging fever recur on March 7, reaching 103·6°F on the 11th and 102·2°F the 13th. The stomatitis improved, but one ulcer persis on the cheek. The white-cell count rose slightly, reach 2700 per c.mm. on March 7 and remaining at this figu

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ent, but closer study suggested that this improvement was a spontaneous remission.

My thanks are due to Miss Miluše Doležalová, S.R.N., for valuable technical assistance.

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PARACENTESIS IN PYOPERICARDIUM

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INTERESTING reports have been published of the conservative treatment of pyopericardium by paracentesis. In one of the most recent cases (Wingfield 1945) penicillin was injected into the pericardial sac.

Price (1946) states that in rheumatic fever a massive serous pericardial effusion is nowadays uncommon and that in rheumatic fever paracentesis is rarely necessary: and Gee (1908) wrote:

> "We dare not puncture upon the bare suspicion that a pericardial effusion may be present: we require that its presence should first of all be rendered most highly probable by other means of physical examination."

But if the case is thought to be one of pyopericardium, early paracentesis must be considered to enable specific treatment, if possible, to be given without delay. Whereas in serous pericarditis the especial dangers of paracentesis are damage to the heart and great vessels and the internal mammary artery, in purulent pericarditis there is also a risk of spreading the infection to one or other pleural cavity.

ance (1920) stated the extreme view when he contended that paracentesis of the pericardium should be banished from surgical practice because pericardiotomy is safer.

Sites of Paracentesis.—King (1941) records the many sites for paracentesis which have been advocated: immediately to the left of the sternum through the third, fourth, fifth, or sixth space; through the fifth space immediately to the right of the sternum: external to the internal mammary artery in the fourth and fifth left spaces: external to the apex-beat but inside the area of cardiac dullness; through the posterior chest wall: and by the costoxiphoid approach. Often the lines of reflexion of the pleuræ are behind the sternum to the level of the sixth costal cartilage on the left and of the seventh costal cartilage on the right. Normally the bare area of the pericardium often does not extend beyond the left margin of the sternum, and therefore pericardial paracentesis to the left of the sternum is likely to puncture the pleura. At least one case has been reported in which a serous pericardial exudate so needled has emptied itself into the left pleural cavity, from which it was aspirated.

Risk of Empyema.—During the course of a pericarditis with effusion there may be a concomitant pleurisy: and it has been suggested that it is caused by pressure on one or other lung root. But, if an empyema develops on that side of the chest through which a pyopericardium has shortly before been needled, direct infection is a likely explanation. The following fatal case of pyopericardium is reported because at the time it was considered to be an illustration of this danger; but the eventual outcome was undoubtedly due to dissemination of the infection to the opposite side of the chest.

In June, 1943, an officer of the R.C.A.F., aged 33, became ill in Malta with bouts of fever and loss of weight. After three months his blood was found to agglutinate suspensions of *Brucella melitensis* in low titre, cysts of *Entamœba histolytica minuta* were isolated from the stools, and on sigmoidoscopy the mucosa appeared marbled. The patient was treated with emetine injections, but his general condition remained unchanged and he was invalided to the U.K. with a diagnosis of undulant fever.

In December, 1943, he still felt ill, with headaches and palpitations; one day he fainted while at stool. No fever or abnormal signs were reported on admission to hospital or during the subsequent two weeks, but then his temperature rose to 102°F, and from then onwards he was febrile and had a persistent cough. Radiography of the chest, blood-counts, and agglutination tests at this time showed no abnormality.

On Dec. 28 a few moist sounds had been heard at the right lung base and there was deep tenderness in the right hypochondrium. A day later he was reported to have been very ill and complaining of pain in the left lower chest on breathing. Fever had increased to 104°F, and there were traces of blood-stained sputum, cyanosis, and pleural and pleuropericardial friction to the left of the sternum. The leucocyte-count was 22,000 per c.mm. The liver was enlarged to one fingerbreadth below the costal margin, and screening of the chest showed some diminished movement of the right half of the diaphragm. The possibility of hepatic abscess had been considered and the liver needled, but no pus was found, and a further course of emetine had been started, together with sulphapyridine.

On Jan. 2 the patient was very ill, with temperature 101°F, pulse-rate 104, respirations 24 per min., a thready pulse, poor peripheral circulation, and a diminished renal output. The cardiac impulse was not felt, the cardiac dullness extended beyond the left nipple line, and pericardial friction was present. There were a few basal crepitations, liver enlargement as before, and meteorism, but no œdema. The presence of a large pericardial effusion was confirmed by radiography, but its cause remained obscure.

Paracentesis.—On Jan. 4 pericardial paracentesis was performed through the fourth left interspace 1 in. from the sternal border. The pericardium was felt to be thickened, and 3½ oz. of turbid fluid containing thick fibrin flakes was obtained: its leucocyte content was 50% neutrophilic but it was sterile on culture. Within the next three days the condition had deteriorated and cardiac tamponade was well marked: the blood-pressure was 102/80, and the leucocyte-count had risen to 48,000 per c.mm. A further 1½ pints of stinking pericardial pus was aspirated through the fourth left interspace, and this was reported as containing short-chain anaerobic penicillin-sensitive streptococci.

Operation.—The patient was then seen by the late Mr. Tudor Edwards, who performed an open drainage of the pericardium under local anæsthesia, the fourth, fifth, and sixth costal cartilages on the left side being resected. More than 2 pints of thickened pus was sucked from the pericardium. At this time 20 ml. of clear fluid was withdrawn from the pleural cavity. Pericardial washouts with penicillin followed, and the pericardial sac became perfectly clear and glistening, but within two days the left pleural effusion had increased considerably, a specimen of the fluid now growing anaerobic streptococci.

During the next two weeks, at repeated needlings of the left pleura, 3½ pints of exudate was withdrawn and penicillin 60,000 units was inserted; penicillin was also given parenterally. With this treatment the pleural exudate had become much clearer, but there was evidence that it was loculating, and it was decided to drain the pleura through an intercostal catheter. Nevertheless the temperature began to rise again, and there were now signs of fluid at the right base, which was sampled and found to grow streptococci. Four days after the insertion of the intercostal drainage on the left side the right pleural cavity was drained similarly. After this the right lung collapsed, there was an ever increasing toxæmia, with respiratory embarrassment, and the patient died eight days later. Necropsy was not performed.

The costoxiphoid approach for pericardial paracentesis was first suggested by Larrey (1829) and has since been used repeatedly, but the references to this method appear most frequently in the continental reports, English workers having emphasised a transthoracic approach. But Rowlands (Rowlands and myelocytes 5%, promyelocytes 4%, myeloblasts 2%, abnormal myeloblasts 2%). A sternal puncture on July 15 showed nucleated cells 52,100 per c.mm., the ratio of cells of the myeloid series to nucleated red cells being 6 : 1—*a shift to the left but no abnormal number of promyelocytes* or myeloblasts. A blood-count showed white cells 26,900 per c.mm., granulocytes 74%, with a well-marked shift to the left.

Cases 3 and 4 had severe agranulocytic membranous angina.

Case 5.—A woman, aged 55, had developed agranulocytosis after three weeks' treatment with sulphathiazole 3 g. daily. Her lowest white-cell count had been 1200 per c.mm., with only 4% degenerated stab cells. Three days later recovery was evident, with 6500 white cells per c.mm., granulocytes 80% (segmented 25%, stab 42%, metamyelocytes 6%, myelocytes 6%, promyelocytes 1%, myeloblasts 1%). Sternal puncture on the same day showed nucleated cells 47,400 per c.mm. the ratio of cells of the myeloid series to nucleated red cells being 10 : 1, with a pronounced shift to the left.

The temperature curves, treatment, and variations in total white-cell and granulocyte counts in these cases *are shown in figs. 1–3.*

DISCUSSION

The impression first gained, that in cases 1 and 2 folic acid had probably been a factor in recovery, was corrected by observation of cases 3, 4, and 5, who received no folic acid. On comparing the courses of the 5 ca with particular attention to the temperature charts, seems probable that in cases 1 and 2 the improveme manifested shortly after the administration of *folic ac* was in fact a spontaneous remission. The diagra published by Black and Stanbury (1947) suggest a simil conclusion. In all these cases, whether treated w folic acid or not, it appears that the earliest sign recovery, preceding the reappearance of the granulocyt *is a fall in temperature,* though this may be obscur if secondary infection is very severe. If some n treatment happens to be started during this phase, is easy to gain the impression that the treatment is t cause of the improvement. In general, however, it only in retrospect that the cause of the improvement c be assessed.

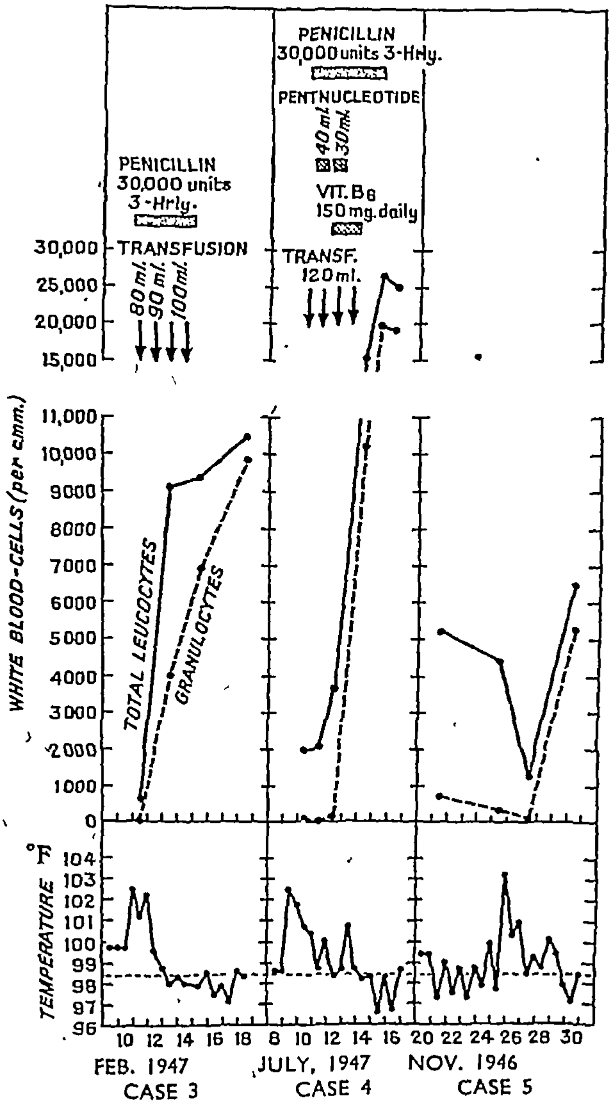

Fig. 3—Treatment, temperature, and white-cell counts in cases 3-5 (not treated with folic acid).

In case 5 the agranulocytosis, due to sulphathiazo was *only transient,* was not accompanied by a secondary infection, and cleared without any treatm after discontinuance of the drug; this case and ca were both notable for the absence of stomal ulcers a angina during the period of agranulocytosis. Cases were all treated with penicillin and received seve small blood-transfusions; in all of them the effect the penicillin on the secondary infection is evide Cases 1, 2, and 4 all received pentnucleotide and py doxine in various amounts without any apparent eff on the disease.

Cases 1 and 2 also received folic acid, and in both them an improvement in the white-cell count was after two days' treatment. It is tempting to attri the improvement to the folic acid, especially in ca where improvement took place on two occasions, of them after forty-eight hours' treatment with f acid. None the less, for the reasons stated above, view does not appear to be justified. During the sec course of folic acid in case 1 the number of segmen forms increased less than twenty-four hours after start of treatment. The leucocyte and granuloc curves also show an upward tendency coincident with decline in the temperature before treatment with f acid was started. In case 2 the temperature had to decline three days before folic acid was given, th the sternal-marrow count and the blood-count did yet show any sign of recovery. With the increa numbers of leucocytes and granulocytes the temperat became and remained normal.

Cases 3 and 4 are notable for their very rapid recove high granulocyte-counts in peripheral blood and bo marrow being noted two or three days *after* alm complete agranulocytosis. Both of these cases remarkable for the fall of the temperature to *norm* as the granulocytes reappeared, despite the presence severe ulcerative angina with membrane. *In cases* and 4 the sternal marrow at the height of the *agranu*cytosis showed low figures of nucleated cells, but th was a contrast *in the proportion of cells of the myelo* series, which was low in case 2 and high in case 4.

Davidson and Girdwood (1947) emphasise that t number of leucocytes and thrombocytes will be *increas* as a result of treatment with folic acid only when t leucopenia and thrombocytopenia are part of a *nutrition* syndrome resulting from a deficiency of *folic aci* Later they reported (Davidson and Girdwood 194 a case of pernicious anæmia which developed seve leucopenia (800 white cells per c.mm.) while *actual* under treatment with folic acid. The *folic acid* w discontinued, and treatment with liver *extract* a penicillin instituted, and recovery followed, *the whit* cell count reaching 9000 per c mm. in *fifteen days.*

SUMMARY

Of 5 cases of agranulocytosis due *to drugs* 2 w treated with *folic acid,* which appeared *to cause* impro

THE LANCET

LONDON: SATURDAY, DEC. 4, 1948

Underpaid

WHAT came out most clearly from the Conference Local Medical Committees last week was the nviction of general practitioners up and down the ntry that in the new service they are being underid. Delegate after delegate testified to the hardships t falling incomes were causing in their constitucies; and these consistent reports made it clearer n ever that many practitioners—especially those ith practices in rural, semirural, or suburban areas, or resorts where the proportion of the elderly or invalid high—are getting an inadequate return for a heavy y's work. It may be (as Dr. GUY DAIN believes) t many will find at the end of their first year in service that their total receipts amount to much e than four times their first quarter's cheque. t in general it seems unlikely that any adjustments t can be made within the sums now allotted for itation, mileage, and inducement funds will suffice overcome the present discontent.

The progress reports given to the conference also ed once more that work—particularly work in consulting-room—has increased everywhere. Dr. IN pointed out one aspect of, and one reason for, increased work when he said that "we no longer called to see a patient, we are called to see a y." This is more and more true. Whether the r is called in or is visited, no financial barrier ins to prevent his being asked to advise on each every ailment afflicting each and every member the family. Perhaps for the first time, he fully lises the scope of the task he undertook when he out to be the family doctor. It is this extra work patient (or per family) that has made most doctors eady busier than they have ever been in these o summer and autumn quarters—quarters which e usually regarded as the healthier part of the rking year. And because they are so busy now, ny look uneasily to the winter months ahead, and onder what extra load these months will bring. e conference deserves credit because it showed no willingness to undertake extra tasks which under itable conditions should provide more opportunity early detection of illness and for preaching and ctising positive health. But the members were rtain that the present terms do not allow for, or courage, the fullest and most careful service, and hat they do not even offer sufficient payment for rk done—except perhaps to the men with the gest practices, who are seriously overworked.

Ways of alleviating hardships have been sought, nd it is hoped that early payment of subsidies from the inducement fund to doctors in the hardest-hit practices may give some help. It is also being pointed out to the Treasury that the total sum et aside for the capitation pool, calculated with the expectation of employing some 17,900 practitioners, will hardly suffice to remunerate the 19,400 who are now known to have joined the service. Certainly, with this increased number, unless there is a proportionate increase in the pool, it will be very difficult to give effect to the recommendations of the Spens Committee and see to it that the various incomes which that committee suggested for different portions of the profession are really attained. It was announced that a careful survey of actual practice incomes from State sources is being made in one of the major counties, and that the result of this survey will be placed with little delay before the Whitley Council, when the case will be argued for a capitation fee much higher than at present—large enough, it is hoped, to translate the Spens promises into fact.

Some discussion took place on the desirability of a further limitation of doctors' lists, but no general agreement was reached for the time being. Though it was agreed that, with the bigger demands on practitioners, it is becoming difficult, if not impossible, for those with the really large practices to satisfy the demands and needs of their patients, it was felt that the redistribution of patients in industrial areas which would take place if practice ceilings were lowered would in itself do little to relieve the situation. Many of the doctors with lists which are not inflated, and which would still be permissible even after any likely reduction was made, are reporting themselves already fully extended; and it would be no comfort to them to offer them further patients whom they could not contentedly accept. The chief help that such a limitation would give would be that, combined with an increased capitation fee, it would allow the industrial practitioner to give more care to each patient and would provide many more openings in such areas for new entrants to practice. The principal need is for an increase in the capitation fee. Next after this was placed the separation, and generous subvention, of the mileage fund. Basic salaries, unless paid from a separate fund, resolve fewer difficulties than they cause.

That some solution must be found is clear. Delegates were deeply concerned about what most of them regard as a deterioration in the mode of practice. They rightly showed that they have no wish or intention to perpetuate conditions which do not allow a doctor to give an unhurried and reasonably efficient service except at grave financial cost to himself.

Surgery in Portal Hypertension

SURGICAL relief of obstruction of the portal circulation in man is a newcomer among feasible operations. In animals the Eck fistula has long been a recognised aid to physiological research; but it carries a fatality-rate which has encouraged the belief that portacaval anastomosis is fatal in human beings. The work of BLAKEMORE and LORD and of WHIPPLE [1] has dispelled all doubt that portal blood can be shunted into the systemic circulation, before it has passed through the liver, without serious consequences to the metabolic economy of the human body; it has brought general recognition that most of the symptoms of Banti's syndrome, and some of the symptoms of hepatic cirrhosis, are due to a rise of pressure in the portal system; it has indicated that "Banti's disease" is not a disease but a syndrome; and it

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[1] See *Lancet*, 1946, i, 743.

Turner 1937) considered that the safest approach for needling was a subcostal one, and Horsley and Bigger (1937) have favoured it in suppurative pericarditis.

Briefly, a needle or a fine trocar and cannula passed from the left costoxiphoid notch upwards, backwards, and slightly outwards immediately behind the costal margin avoids the peritoneal cavity and, on piercing the diaphragm, immediately enters the pericardial sac. Therefore, when pus is being aspirated, soiling of the pleural cavity is avoided.

I wish to thank Dr. Geoffrey Bourne for his comments on this case.

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Reviews of Books

The National Health Service Act, 1946, Annotated

Together with various Orders and Regulations made thereunder. S. R. SPELLER, LL.B., secretary and director of education, Institute of Hospital Administrators. London: H. K. Lewis. 1948. Pp. 498. 42*s*.

Mr. Speller provides an annotated text of the National Health Service Act, and the texts of 29 orders and regulations made thereunder. Despite his industry, and the celerity of his publisher, he has been unable to keep up with the spate of statutory instruments; but he has ingeniously met the difficulty by including a supplementary index which itemises the contents of a further 18 orders and regulations.

The foreword expresses a modest hope that the book "may provide a useful guide to the Act and to delegated legislation thereunder, alike for members of the legal profession and for those engaged in the administration and provision of the health service." It will; in fact it seems destined to become the standard work on the subject. The main index, of some 60 pages, stands up well to hard sample testing, and the annotations are clear and concise. On p. 8 Mr. Speller even attempts to define a specialist—a task which the Royal Colleges in their wisdom have by-passed.

Most of those whose duty it is to make the Act work have found little time to familiarise themselves with even a part of the relevant legislation. Here in convenient form are provided the orders and regulations on regional hospital boards, executive councils, general dental services, general medical and pharmaceutical services, superannuation, and many other matters. A second edition will unfortunately but usefully contain many more. (Room for these could be partially derived from omitting some of the more technical orders of local application only, such as the Monmouthshire and Rutland Executive Council Order.) Possibly Mr. Speller will consider including also at least a digest of the more important circulars and memoranda issued by the Ministry of Health, which so far, perhaps inevitably, have had a limited circulation.

Clinical Laboratory Methods and Diagnosis

(4th ed.) R. B. H. GRADWOHL, M.D., D.SC., pathologist, Christian Hospital, St. Louis, Missouri. St. Louis: C. V. Mosby Co. London: H. Kimpton. 1948. Vols. I and II, pp. 2284; vol. III, pp. 864. £10 10*s*.

THE latest edition of this well-known compendium appears in three volumes instead of two. The section on tropical medicine, parasitology, helminthology, and allied subjects has been bound in a separate volume, and the name of Dr. Pedro Kouri, of Havana, is very properly placed on it. This section remains one of the best accounts of the subject, and the lavish standard of illustration has been maintained.

Dr. Gradwohl states that every section has bee brought up to date, and we may thus avoid a catalogue. Any section into which the reader dips i likely to offer evidence of this detailed revision, and th man who uses the index will hardly find any topic lef out. The section on the Rh factors is very good, and gallant attempt is made to explain "blocking" anti bodies. The hæmatological colour plates are still dis appointing; they picture results obtained almos exclusively with Giemsa stain, now rarely used by itself indeed, the text recommends its combination wit Wright's stain. The techniques given are those popula in America, and current British methods are ofte omitted: for example, the Haldane hæmoglobinomet is not mentioned though other less reliable instrument are fully described. And, as in so many comprehensiv books, there is nothing to indicate which of sever alternative methods is the best.

The fourth edition does not differ from the third much that replacement is essential; but every laborator should have one or other on its reference shelf.

Hæmostatic Agents

WALTER H. SEEGERS, M.S., PH.D., professor of physiolog Wayne University College of Medicine, Detroit; ELWO A. SHARP, M.D., SC.D., director, department of clinic investigation. Springfield, Ill.: C. C. Thomas. Oxfor Blackwell Scientific Publications. 1948. Pp. 131. 2

THIS monograph deals competently with the prepar tion, properties, and use of the absorbable hæmostati fibrin foam, oxidised cellulose, and gelatin sponge, wi and without the addition of thrombin. There is a very clear introductory section on the mechanism biochemistry of blood clotting, and then a reasonab full account of the preparation and use of thrombi Bovine thrombin and fibrinogen can be used as hæm statics provided they are used only topically, a experiment has shown that sensitivity does not devel in patients when these materials are applied. T departments of surgery in which these absorbab hæmostatics can be employed are detailed, and cle instructions about the techniques for getting the be results are given. Finally comes a list of no less th 370 references, many of them not very relevant the matter discussed.

The book is well produced and contains some colour photographs. It is a disadvantage, however, the review of this rapidly developing subject sto short in 1946; and the question of hæmost the hæmorrhagic diseases is ignored.

Treatment and Disposal of Industrial Waste Water (H.M. Stationery Office. 12*s*. 6*d*.).—A publication of the Depar ment of Scientific and Industrial Research, is the first ne British book on this subject in 35 years. It describes much the work of the water pollution research laboratory set up b the department in 1927; but it also sets out the chief result reported elsewhere.

Identification of Tumours (Philadelphia and London J. B. Lippincott. 1948. Pp. 397. 36*s*.).—The author, Prof. N Chandler Foot, of New York, says that his "ready referenc book" for use in the diagnosis of tumours is intended for u "by student, pathologist, surgeon or practitioner." A chapte is given to each tissue, organ, or system, and the commone tumours are listed with brief notes on their source, site, relationships to age and sex, gross and microscopical appearances, metastasising propensity, and prognosis. At the end of the book these tumours are arranged in tabular form under the headings of type cell, stroma or matrix, differentiation, mitotic figures, other features, chemical admixture, and diagnosis; and the whole is illustrated by 241 photomicrographs of very varying quality. The objection to this labour-saving attempt is that morbid histology cannot be learned or honestly practised by any penny-in-the-slot method. There is only one road, which is long and arduous, though very satisfying to the few who are willing to travel it. The trained morbid histologist will find the "ready referenc book" quite insufficient; the laboratory technician in training may for a time be pleased with it, but will discover that its help is specious; and the medical student will learn more surely from his own teachers.

and round their subject. Dr. CHARLES regretted that by 1890 the pattern of the whole-time medical officer of health was already set, and becoming fixed among sanitary details; though later, he admitted, it was enriched by the addition of maternity and child welfare. The M.O.H. of today, he thinks, specialises too early, lacks the breadth of outlook of the pioneers, and seldom, once he has settled into his job, has time to acquire the ripeness of judgment that social medicine demands. Routine work hampers him. Dr. CHARLES believes that the M.O.H. should have, like M'Gonigle, a pastoral mission among his community: but those who do their work in such a spirit are few.

But if the men have changed, so has their destiny. The pattern of sanitary detail is melting before our eyes, as Dr. J. N. MORRIS pointed out not long ago [illegible] a broadcast talk.[7] Social medicine is nowadays hard to define; it strikes into so many aspects of contemporary life. Perhaps the regeneration of man must always begin with a good drainage system: certainly the Victorian administrators and philanthropists found that people who are forced to live like beasts can behave like them. Lambert, working [illegible] the Rockefeller Foundation in the South Seas, proved that for a people ravaged by hookworm the first civilising procedure is to build latrines. The same principle doubtless holds for the sick native tribes of Africa; and an echo of the message is to be found in the French film, *Monsieur Vincent*, now running in London: "You cannot save people's souls until you have given them a life worth living." Social medicine began in squalor, and squalor is [illegible] yet defeated. Of the six needs of man—air, water, food, housing, clothing, and fuel—set out in [illegible] by Dr. Hector Gavin in his book, *Sanitary Ramblings,* several are still defective: our air is polluted, a pure water-supply is not universal, houses [illegible] too few, and fuel costly. There is still much sickness, though relatively little from defective sanitation. Much of it is hard to define except as sickness of the mind or spirit—nervous and psychosomatic illness, and what Dr. MORRIS called "unfitness, incapacity for work, and mere absence of wellbeing." There is a wide and difficult country opening before the M.O.H. His specialty is rapidly spreading into a social service, and as well as preventing disease by physical measures he must now take part in promoting health by social action. That is how Dr. MORRIS sees it; and he illustrated his point from the case of the man with the chronic duodenal ulcer—a physical disorder associated with some emotional disturbance such as money trouble, a desire to achieve more than [illegible] is really capable of achieving, disharmony in his personal relationships; a disorder, in short of the man in his social setting. Duodenal ulceration is only one expression of this disorder. Social medicine, because it deals with man as a social being, a member of his group, must take account of the disease in all its manifestations, and if, as some think, nervous and psychosomatic disorders are increasing, it means that more and more people are finding it hard to adjust themselves to their surroundings. Dr. MORRIS would have us look for the social forces which have encouraged such disorders. The question can be approached in two ways: we may ask why so many people have personalities that are liable to break down; or why society, as it is, causes the breakdown of so many people. Neither question can be answered alone, for society shapes personality and people make society. The growth of personality and character, and, up to a point, of intelligence, are related to the stimuli provided by the environment. The individual has to adjust himself to his own potentialities—to learn to live with his own nature—and to do it within the cultural pattern of his group. If this is narrow or warping, many of his potentialities will die of inanition, just as his muscles would waste if he spent his life in a cage. As Dr. MORRIS put it, "personality is not finished off, complete, in early childhood." The culture in which the child grows up is first transmitted and interpreted by the family unit; and parents whose opportunities have been narrow will transmit a thin and imperfect version of their nation's culture to their child—a version which he may never get the chance to expand or outgrow. A society composed mainly of dwarfed or limited personalities will have a narrow culture. Thus a nation which breeds many skilled craftsmen, though it may be turbulent at times, will be mentally alert and growing, whereas a nation of factory hands might well be very different. Dr. MORRIS suggested that "our urban industrial culture is restlessly changing, complicated and contradictory, impersonal and anonymous; work is often reduced to the lowest common denominator of the many meanings that work can have." Yet the same sorts of people who may suffer mentally and physically under this kind of stress—of which boredom is perhaps the leading characteristic—may respond to another kind of stress by growing beyond recognition: Dr. MORRIS cited a convoy of Wingate's Chindits who arrived at a hospital in India in 1944. "It was hard to believe," he said, "that these remarkable personalities had started as just ordinary youngsters from the mean streets of our industrial towns."

Here then is the new enterprise to which social medicine must address itself—the task of finding out how men living in society can grow to their full mental and moral stature, and how the State can provide them with the opportunities for such growth without forcing them into a statutory pattern. This is no less than the problem of government which has confounded rulers since men first began to live in groups. We have seen many attempts to solve it: in some, the State overrides the individual, in others the individual can coerce the State—but only at the expense of other members of the community. Neither will serve. Men have yet to learn to live together; and perhaps one of the reasons they have failed to do so successfully is that there has never so far been a community whose adults were fully grown. Physical well-being is important, but social medicine must also study the frustrating and stultifying forces in our culture which cause ill health of the mind; and ultimately it must be in a position to suggest remedies. Here is a giant's undertaking for medical officers of health; and if we agree with Dr. MORRIS that men grow in response to the demands and opportunities of their calling, then Dr. CHARLES's fears can be allayed: another race of giants is on the way.

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[7] Social Science of Medicine. Broadcast in the Third Programme on Sept. 24.

has explained why splenectomy has only occasionally relieved those suffering from this syndrome.

Operation for portal hypertension is indicated chiefly for relief of the hæmatemeses which are the most usual cause of death in those afflicted. It depends for its success, at least in the first instance, on discovering the site of the causal obstruction to the portal blood. (The importance of this can be understood from a study of fig. 5 in LEARMONTH and MACPHERSON's paper, which appears in this issue.) The essence of the operation is to anastomose the obstructed section of the portal bed to any large vein of the systemic circulation which is anatomically convenient. There are therefore a number of alternative sites for the anastomosis, none of which is applicable to all cases. Thus obstruction due to cirrhosis of the liver can be overcome by a portal-systemic shunt at any point of suitable size in the portal tree, whereas obstruction of the splenic vein would not be relieved by joining the portal vein to the inferior vena cava. LEARMONTH and MACPHERSON record their experience in 16 cases of portal hypertension, the largest series so far published in this country. In 9 cases they performed a lienorenal vein anastomosis (after splenectomy and left nephrectomy) with 6 excellent results, 2 deaths, and 1 case too recent for evaluation; in 3 cases of splenic vein obstruction they removed the spleen with good effect; and in 4 cases they were unable for technical reasons to achieve what was required. They find that cases of portal hypertension fall into three clinical groups—the acute, the episodic, and the chronic—and that it is the last group that benefits most by operation. They emphasise the need to make sure that hæmatemesis is due to portal hypertension and not to lowered prothrombin levels in the blood caused by liver damage, and also to make sure that any patient operated on possesses two normal kidneys. To praise their work would be *almost* impertinence.

For accounts of alternative methods of producing portacaval shunts, and for further details of the selection of cases, the techniques available, and the postoperative treatment, one must turn to American sources. BLAKEMORE [2] in 1947 had done 23 portacaval shunts, 15 being accomplished by the same technique as LEARMONTH and MACPHERSON used. In 1 case the splenic vein was anastomosed to the vena cava, and in 7 an end-to-side junction of the portal vein to the vena cava was done. In this series there were 4 deaths. The junction of the portal vein to the vena cava has the obvious advantage of providing the most complete possible shunt of portal blood, and its size and the speed of blood flowing through it give the best guarantees that the hypertension will be relieved and that thrombosis will not occlude the shunt. Morbid changes in and around the portal vein, or a block in the portal system distal to the point where the splenic and superior mesenteric veins join, may make this procedure impossible or useless. It also suffers from the disadvantage that work on the upper part of the inferior vena cava must be rapid if the kidneys are to survive, since they will tolerate venous obstruction for only 15–20 minutes. WELCH [3] has described an ingenious method of overcoming thi difficulty, but the technical problems, especiall when the liver is enlarged, must be great. LINTON has described 4 cases where splenectomy an injection of œsophageal varices had been performe without relief, in which anastomoses of the superic mesenteric vein to the vena cava, of the inferic mesenteric to the ovarian vein, of the splenic ve to the renal vein, and of the inferior mesenteric the left adrenal vein have been carried out. Onl the last case was unsatisfactory, probably becau extreme technical difficulties prevented veins suitable size being anastomosed. LINTON believ that an end-to-side lienorenal vein anastom is the most satisfactory type of portacaval shu and that it should be done at the same operation which the spleen is removed if the surgeon is n "to miss the bus." BLAKEMORE [5] has now broug his series up to 40 cases, with an operative mortali of 12%. He also favours the end-to-side lien renal anastomosis (which makes sacrifice of the l kidney unnecessary) and he prefers direct sutu of the vessels to the 'Vitallium'-tube technique (which he was a pioneer). It is naturally essent to the success of the operation that the shunt shou remain patent, and to achieve this the anastomo veins must not be twisted or lie kinked or angl Postoperative abdominal distension and early amb lation may cause pressure on, or tension of, t anastomoses, and it is well to prolong the clotti time with heparin while the patient is in bed.

An operation in which selection of suitable cas choice of the most suitable site for shunt, and executi of the anastomosis are all matters of considera difficulty, is for experts only. The portacaval shu is, however, *no longer an experiment.* It can life in cases where hæmatemesis from œsophage varices makes death the early and sole alternativ *Its more remote effects have still to be assessed.*

Changing Ends of Social Medicine

IN some mythologies, giants peopled the wor before men. Dr. J. A. CHARLES, in his Bradsha lecture last week,[6] presented just such a pensi notion of the public-health service; and indeed, th great names in which he dealt—Chadwick, Simo Bristowe, Barclay, and *others—belonged to* pe sonalities which in the main were a good deal mo than life size; or appear so through the dust the raised. We owe much to them: to Chadwick description of the squalor in which the poor lived to Simon's classical reports when he was medic officer of London; to Bristowe's investigation c phosphorus hazards; to Anstie, Carr, and Har THE LANCET's commissioners, for their accounts o workhouse infirmaries; to Lankester, who succeede Thomas Wakley as coroner of Middlesex and main tained his tradition; to Tom Taylor, Simon's secretar on the General Board of Health, who wrote *Th Ticket of Leave Man* and later gave up public health to edit *Punch*. They were all-round men, widely educated, the doctors among them distinguished in their profession, with minds that ranged deep into in indian hemp originates with the Indian, Arab, negro seaman and extends by way of the dock areas London to the West End, where it is smoked and ddled on a small scale by a few coloured men.

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[2] Blakemore, A. A. *Surg. Gynec. Obstet.* 1947, 84, 645.
[3] Welch, C. S. *Ibid*, 1947. 85, 492.
[4] Linton, R. R. *New Engl. J. Med.* 1948, 238, 723.
[5] Blakemore, A. H. *Surg. Clin. N. Amer.* 1948, 28, 279.
[6] Victorian Medical Administrators. Delivered at the Royal College of Physicians on Nov. 23.

During the year there were only 20 instances of scriptions forged with a view to obtaining narcotics gally. The smallness of this number probably ects less the true demand for illegal narcotics than e known efficiency of preventive legislation. (The ties of doctor and dentist in this respect have lately en described in the new edition of a Home Office emorandum.[6]) Drug addiction is, of course, much rare than these figures indicate; for some of the mmoner drugs of addiction do not come within the ovince of the report.

RUSSIA, EUROPE, AND W.H.O.

THE second session of the executive board of the orld Health Organisation opened at Geneva on Oct. 25 th a setback. Telegrams were read from the U.S.S.R. d Byelorussian members, the former stating that he uld not come because the late receipt of the agenda d not allow him to contribute usefully to the discussion, d the latter that he was "prevented" from attending. hough the board replied that it deeply regretted their ence, and still hoped they would be able to come r in the three weeks' session, nothing further was rd. This Russian action certainly did not stem from delegates themselves, or the health authorities, must have been political in origin. We trust that Soviet leaders will speedily return to their former that world collaboration for health is possible and one of the few remaining bridges between the East West should not be permanently destroyed.

The remaining 16 members, including those from nd and Yugoslavia, did valuable work. The most ortant item was perhaps the 1950 budget, which redible as it may seem—must be ready this month. ssion of the principles involved led back to the question whether a serious effort can be made to the level of health of the peoples of the world or her W.H.O. must content itself broadly with the tyle inexpensive activities of its predecessors.[7] a body of individuals "technically qualified in field of health" there could be but one answer, after brilliantly dispelling certain hesitations, director-general, Dr. Brock Chisholm, received the rd's mandate to prepare for the next assembly a w Look budget for 1950. Meanwhile the board learned ith satisfaction of the establishment of the first of the .H.O.'s regional organisations, that for South-East a, with headquarters at New Delhi, and approved the pointment of Colonel C. Mani, at present the member the board nominated by India, as regional director. also decided to leave to the director-general the mplicated and thorny subject of allocations to countries programmes of assistance by means of demonstration ms, experts, fellowships, and medical literature, for ich a total of about $1^1/_2$ million can be used in 49. A pleasant interlude from administrative matters s afforded by the account of the vast B.C.G. vaccination ogrammes being undertaken by the Scandinavian Red oss Societies and the International Children's Emer- ncy Fund and of the proposed epidemiological and tistical research arising out of them.[8] Discussion of proposal by the member from France, Prof. J. Parisot, to reduce the number, length, and cost of organisational meetings of the governing bodies was deferred to the third session. Now that the end of the organisational stage of W.H.O. is in sight, it should clearly be possible to reduce the budget allocations for meetings of the executive board and the assembly, and also the undue demands on the time both of the members of these bodies and of the secretariat. W.H.O. has not, as yet, followed UNESCO in overloading the administrative side of the staff,[9] but it must constantly guard against the similar danger of spending too much time and money on meetings of its governing bodies.

On Nov. 15, immediately after the meeting of the executive board, there was a two-day conference of representatives of European countries. Of 23 invited, 16 sent representatives, including Bulgaria, Czechoslovakia, Hungary, Poland, and Yugoslavia—but not the Russians. The assembly had decided that, as the headquarters of W.H.O. are to be in Geneva, a regional organisation in the full sense of the constitution will not be necessary for Europe, and that a special temporary administrative office for the health reconstruction of war-damaged countries should be set up instead. The object of the conference was to advise the director-general on the tasks of such an office—i.e., the health needs of Europe which might be met by W.H.O. in 1949 and 1950—and on its location and staffing. Dr. C. van den Berg (Netherlands), who was elected chairman, had a somewhat difficult task because the Czechoslovak delegation, supported by their colleagues from eastern Europe, persisted in trying to reverse the assembly's decision and set up a complete regional organisation, to be located in Czechoslovakia. In view of the very limited funds available, agreement might well have been reached on the compromise proposal of the vice-chairman, Dr. B. Kozusznik (Poland), that a special office should be established provisionally at Geneva, but for the unexpected and stubborn intervention of the delegate of Denmark in favour of Copenhagen. Despite this failure to achieve unanimity, useful information was provided for the secretariat in drawing up plans for 1949 and 1950.

RAPID DIGITALISATION

RAPID digitalisation is required by the patient in distress from congestive heart-failure due to a rapid ventricular rate from auricular fibrillation or other causes. Over thirty years ago Eggleston introduced a method by which dosage was calculated from body-weight. By this method dosage was unnecessarily large; but today, on the other hand, the tendency is to give far too little digitalis and needlessly postpone the relief it gives.

In an inquiry by William Evans and his colleagues[10] twenty patients with auricular fibrillation, heart-failure, and high ventricular rate were each given a series of digitalis drugs, with an interval of 3 to 14 days between each drug to allow the rate of ventricular contraction to rise again. The criterion adopted was the extent of ventricular slowing within 4 hours—a standard which is fully justified because there is reason to think that ventricular slowing is as much the result as the cause of improved myocardial function.[11] Results are usually believed to be better with redigitalisation after a short interval than when the patient is digitalised for the first time; but this difficulty was overcome by administering the preparations in a different order in the various patients. Three drugs—'Digoxin,' lanatosid C, and digitaline (Nativelle)—were found to be the best. Digoxin by mouth was effective within 4 hours, usually with a dose of 2 mg. and always with a dose of 3 mg. Intravenous digoxin 1·5 mg. produced still quicker results, but such rapidity is rarely essential and may be attended with some slight risk. Intravenous strophanthin

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[6] Dangerous Drugs Acts, 1920 to 1932: Memorandum as to Duties of Doctors and Dentists. D.D.101, 5th ed. H.M. Stationery Office. Pp. 12. 3*d*.

[7] See *Lancet*, July 3, p. 17.

[8] *Ibid*, Nov. 27, p. 855.

[9] See *New Statesman and Nation*, Nov. 20, p. 431.

[10] Evans, W., Dick, P., Evans, B. *Brit. Heart J.* 1948, 10, 103.

[11] Luten, D. Clinical Use of Digitalis. London, 1936. Gold, H. *Science*, 1943, 97, 125.

Annotations

THE NEGLECTED FAMILY

In the Lloyd Roberts lecture published in these columns on Nov. 20, Mr. R. M. Titmuss pointed out that, though we respect the family as a social unit, we behave in a way that makes the propagation of children a common source of poverty. This behaviour is not deliberate: it is merely the result of our finding it simpler to ignore the problem. The question is whether we can afford to go on doing so.

In Sweden public concern about the position of the family has been awakened by the work of two population commissions.[1] These have put forward many practicable schemes of assistance, since adopted by the Swedish parliament. The new family allowances, which are tax-free and given for first as well as subsequent children, amount to 260 kroner per child per year (about £18). They are given irrespective of income, and for those earning up to 20,000 kroner they give more relief than did the former tax rebates, which have been discontinued. The object of this change was to benefit the large families, most of which got no benefit from the rebates because their income was not large enough to attract tax; but it works to the disadvantage of those with more than about £1380 a year. In Sweden it is thought more important to raise the general standard of living than to enable the middle classes to obtain for their children special advantages in education. But in this country, until the public system of education has considerably improved, a great many people of the professional and managerial classes will continue to restrict their families to the number to which they can give what they think a good education. For most of them this number is already small, and with the rise of school and other fees it is getting smaller. Family allowances would have to be on a very different scale in order to have any significant effect on a far from negligible section of the community. For this section there would be more incentive to childbearing, as well as to individual effort, if income-tax rebates for children, so far from being abolished, were to rise proportionately with income, as proposed by Mr. Richard Hughes.[2]

The problems of the family cannot, of course, be solved by rebates or allowances alone. Children not only cause poverty but also severely restrict the activities of their parents. In the report on maternity in Britain, reviewed in a leading article a fortnight ago,[3] it is shown, for example, how mothers with large families are unable to make full use of the maternity services. Family ties prevent them from getting early and regular antenatal supervision and from taking their children to welfare centres. They live in the most overcrowded homes, yet are unable to leave their families for a hospital confinement. Often they have to get up a few days after delivery to supervise and take an active part in the housework. In addition, their impoverishment is shown by economies, progressing with each new birth, on maternity clothes and layette. In planning satisfactory health services, clearly we must think in terms of the family unit rather than of individuals, and in this respect Sweden has much to teach us.

The fact is that in many directions our policies will be unsound unless they are based on a detailed knowledge of the social, economic, and medical needs of the family in this country, and it is important that research should be stimulated along broad lines. New family budget studies, and inquiries into the burden of domestic work in the home, and into the lack of spare time which c necessity arises from having many children, are a important and have a medical as well as a soci significance. Dr. Stella Instone's report on the housewif appearing in our present issue, is an independent stud with no little relevance to the birth-rate, and we ar glad to hear that others are in progress. The results c all these investigations must not remain buried in th pages of specialised journals, but must be used to arou and sustain the public interest which is a necessar preliminary to any adequate legislation by the Goven ment. Meanwhile, without legislation, there is a grea deal that the Government could do if they were to pu encouragement of the young family high among the purposes. The change of policy about Service allowanc made in 1945 was socially retrograde: as Titmu says, "childlessness was rewarded, and disapproval w shown to those with more than two children." Y last week, when Service pay was again revised, th basic error was perpetuated.

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[1] Gille, H. *Population Studies*, 1948, 2, 3, 120.

[2] *Times*, Nov. 23, p. 5.

[3] Maternity in Britain: rer [illegible] t the Royal College of Obstetricians [illegible] Population Investigation Committee [illegible] rsity Press. 1948.

ENTEROGASTRONE

Some years ago Kosaka and Lim [1] obtained from t mucosa of the small and large intestine of dogs an extra which was found to inhibit gastric secretion; the acti principle they called enterogastrone. Later Ivy and h co-workers [2] prepared a more potent extract from t duodenal mucosa of swine, and further work on anim has suggested that this substance is a safegua against the development of peptic ulcer. Ivy, a Greengard and others [3] have, indeed, evidence that man the administration of enterogastrone by mou helps to prevent the development or recurrence of ulce

Hopes born of these experimental and clinical studi are shaken by a report from Sandweiss and his colleagu who treated 48 ambulatory patients, suffering from prov duodenal ulcer, with enterogastrone parenterally and mouth. After injection most of the patients had pa and the first two to be injected developed urticar The results were wholly disappointing. Only 55 became symptom-free, while 70% relapsed within o year after treatment. (The comparable figures for a ambulant diet-alkali régime were 79% and 57%, and f treatment with parenteral injections of distilled wat 59% and 92%.) This does not detract from the intere of previous experimental findings in Mann-Williamso dogs—animals subjected to a gastrojejunostomy pl surgical duodenal drainage—where enterogastrone trea ment appears to protect against jejunal ulcer.

DANGEROUS DRUGS

Last year's official figure for the number of addic to dangerous drugs in Great Britain and Norther Ireland is 383.[5] Of these, unhappily, no fewer tha 82 were doctors, of whom 10 were convicted of violatin the Narcotic Laws. Morphine and diacetylmorphin are, it seems, the principal drugs of addiction, and i about 95% of cases only one drug is used. Cocaine i an increasingly rare cause of addiction; indeed pethidin is said now to take precedence over it. The only rea illegal traffic is reported to be among alien seamen wh bring in opium and indian hemp for use by themselve and their fellow-countrymen in the seaport towns including London. Opium remains almost exclusively the drug of the Chinese smuggler and smoker, while th

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[1] Kosaka, T., Lim, R. K. S. *Proc. Soc. exp. Biol. Med.* 1930 27, 890.

[2] Gray, J. S., Bradley, W. B., Ivy, A. C. *Amer. J. Physiol.* 1937, 118, 403.

[3] Greengard, H., Atkinson, A. J., Grossman, M. I., Ivy, A. C. *Gastroenterology*, 1946, 7, 625.

[4] Sandweiss, D. J., Sugarman, M. H., Lockwood, B. C. *J. Amer. med. Ass.* 1948, 138, 552.

[5] Traffic in Opium and Other Dangerous Drugs: Report to the United Nations by His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland for 1947.

Special Articles

THE WELFARE OF THE HOUSEWIFE

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> Strength and dignity are her clothing; and she laugheth at the time to come."—*Proverbs*, xxxi, 25.

THE housewife and her problems have lately received ce attention in the press and elsewhere. But though re have been expressions of sympathy for her culties and respect for her courage, no detailed dy has been made of the housewife or her daily life. therefore seemed of interest to assess the welfare of sewives, with special reference to their health, any orders peculiar to or prevalent among them, and the portant causes and results of fatigue in them. The pe and implications of such questions are obviously de enough to justify a large-scale sociomedical survey. vertheless, a small hospital has afforded opportunities a limited investigation which might serve as a pilot vey for future work.

This report is based on a study of 61 housewives seen h the help of the almoner at the New Sussex Hospital Women, Brighton. The hospital has 74 beds for ical, surgical, and gynæcological cases, and out-ient clinics are held each day. So far as possible we e women with young children at home, preferably large families. Unmarried women, whatever their e responsibilities, were excluded. Our aim was to dy the whole-time housewife doing no remunerative k outside her home. So far as possible we selected althy" women under hospital care for some purely l complaint, so that the findings could be attributed to their occupation and environment.

e 61 housewives all came voluntarily for interview. difficulty, early apparent, was the reluctance, and often the inability, of many women to spare the for an appointment. In most cases where an view was refused this seemed to be due to genuine re of work, but in an appreciable minority it was to bad management of the day's commitments.

he housewives in the survey are all drawn from the me-group of £5 a week or less (husband's wages). ir ages range from 26 to 64. No attempt has been de to concentrate on a particular age-group, though t of the women were under 50; they could all be ribed as working women. They all lived in, or thin 15 miles of, Brighton and Hove. It was decided take in each case the fullest possible history, even at risk of obtaining many irrelevant facts. Often it s not until she had been talking for some time, dually gaining interest and confidence, that a woman de any remark of special importance. Each housewife asked the same questions.

Not one of these women resented the interview. Their plete lack of reticence was surprising, as was the erness with which they answered questions about their and work. This suggests that lack of recognition her family may contribute to the disgruntled first pression which the working housewife often gives.

Each woman was first questioned on the subjects ven below. This conversation was made as informal possible, and no housewife needed any encouragement talk. On the contrary, they seemed to welcome an pportunity of airing their problems, and many expressed prise that these were thought to be worth discussing. ach woman was then given a careful physical examina-on. Any noteworthy findings were recorded, together ith an impression gained of her intelligence and general ppearance, especially as regards fatigue. This was llowed by an interview with the almoner, which served to amplify, and often to augment, the facts already obtained about the background of each woman. Where it seemed necessary, the woman was visited in her home. Ideally a visit should have been made in every case, but this was impracticable.

Whenever domestic difficulties were found to dominate the picture, the housewife in question was followed up, and in many cases of this type the almoner gave practical help and advice. Often—and especially where the veracity of the housewife was in doubt—the husband or other members of the family were questioned.

In this account no attempt has been made to present accurate statistical records, for many aspects of the welfare of the housewife cannot be statistically assessed. It might almost be said that none of her problems is absolute, but that each one arises from the effect of circumstance on the individual.

The main points in the history and examination of each case were as follows:

HISTORY

Age. Marriage: duration and nature. Husband's work.
Own work; home commitments; amount of help available.
Children: ages, number at home.
Past health. Housing conditions. Sleep: duration and effects.
Appetite: fair share of rations; meals for a day. Leisure: recreations.
Obstetrical history; menstrual history. Anxiety. Smoking. Holidays.

EXAMINATION

General appearance, facies, intelligence. Posture. Hands. Feet. Back. Legs.
Cardiovascular, respiratory, digestive, and nervous systems. Skin. Joints. Endocrines. Emotional state.
Summary of incidental findings.

The almoner inquired briefly into the social, economic, and domestic background.

HISTORY

Circumstances of Marriage.—Most of the housewives said that their marriage had been happy. On further questioning many of them qualified this statement with such remarks as: "Apart from arguments . . .," "On the whole . . .," or "I mustn't grumble, considering. . . ." Serious unhappiness, sufficient to cause constant preoccupation, was admitted in 10 cases.

Housing.—In 13 cases the housing conditions were seriously inadequate as regards the number of rooms or the physical environment. In many more cases there were constant difficulties owing to sharing accommodation with other members of the family.

Work.—Nearly all these housewives were fully occupied with their own cooking, shopping, housework, and laundry. One had help with her housework for two hours on two days a week, 17 were given limited but regular and willing help by other members of the family; in 2 cases the shopping was done by a child or by a neighbour, who asked for 2*s*. 6*d*. an hour for this service; and 4 housewives were doing regular part-time daily work in addition to their home duties.

Children.—The number of children at home ranged from one to thirteen. Children of 12–15 years were the most helpful to their mothers; those who had left school and were going out to work were generally reluctant to help, even at the weekends.

Sleep.—Sleep lasted between $6^{1}/_{2}$ and 11 hours a night; the most usual duration was 8–$9^{1}/_{2}$ hours. Nevertheless 53 of the 61 housewives said they woke tired every morning. Several of them dreamed regularly of cooking, shopping, and standing in a queue. A few admitted to waking up at intervals during the night and planning the next day's meals. The majority became most tired in the early afternoon when they were liable to fall asleep at their work or on sitting down.

was not nearly so effective, especially when the dose was no more than gr. $^1/_{100}$, which is generally regarded as the maximum to be given with safety. This seems to refute the Continental view that strophanthin has a special virtue not present in digitalis. However, the purer strophanthin-G (ouabain) was not tested often enough to justify comparison. The older preparations—digitalis leaf (gr. 6) and the tincture (2 drachms)—proved comparatively ineffective, but these doses are small in proportion to those of the other preparations tested. In all the 76 tests toxicity was noted only once. In another study, De Graff and his colleagues[12] report poor results from digitoxin with an initial dose of 1·2 mg. orally in patients with auricular fibrillation and a rapid ventricular rate. This rate was reduced only slightly 24 hours after the drug was given; but the degree of heart-failure was usually severe, many of the patients were elderly, the doses were smaller, and the timing of the observations was different.

It is over 170 years since the historic work of Withering on digitalis. Even now each increase in knowledge brings a fresh problem, and shows once again that in the last resort the correct use of digitalis must be determined for each case individually.

OUR FALLING STANDARDS

MEN do not behave honestly without the help of stringent training. Honesty and truthfulness are no more inherent in them than cleanliness and punctuality. We are born uncivilised, grasping, and self-important, and only learn to live like reasonable citizens after many years' schooling by precept and example. In regretting the increase of crime, and especially of juvenile crime, since 1938, the Archbishop of York, speaking in the House of Lords on Nov. 23, ascribed our national decline in honesty and truthfulness to the many factors which have interrupted this training—the war, the breakdown of home life, and a growing disrespect for law, bred, he thinks, by the multiplication of trifling and unnecessary restrictions. Again, goods are scarce, and the temptation to appropriate them is therefore greater, while police are fewer than they should be. Some recovery from the moral decline that commonly goes with war should now be apparent, but we still lag behind the 1938 level. Thus in 1947, indictable offences showed a 47% increase over the 1938 figure of 78,000, while larceny had increased by 37%, breaking and stealing by 88%, receiving of stolen goods by 141%, sexual offences by 46%, and violence by 58%. More than a quarter of those found guilty of larceny were under the age of seventeen, and a further 12% were between seventeen and twenty-one. More than half those convicted for breaking and stealing were under seventeen, and a further 16% were between seventeen and twenty-one. The increase of offences among those under twenty-one was nearly 70% of the 1938 figure. Actually, there were slight signs of a change for the better in recent years, as Viscount Maugham noted in the same debate. He was borne out in this by the Lord Chancellor, who mentioned that the number of children found guilty of indictable offences declined, erratically, from a peak of 43,000 in 1941 to 36,000 in 1946. Unfortunately the figure for the first half of 1948 is 22,000; so the number for the whole year may be expected to exceed even that for 1941.

The remedies are hard to decide. In the debate all agreed that a bigger police force would help; and all were anxious to see our country recover its former moral standards. It is no use, the Archbishop felt, to expect the Churches to accomplish unaided this moral regeneration: they have been preaching the value of truthfulness and honesty for nearly 2000 years, but "the vast majority of the people of the country no longer pay attention to what is said by the Churches." He made the refreshin suggestion that the State should have a drive for honest and truthfulness, calling in the help of the press, th cinema, and the wireless. The appeal should be mad he thinks, largely on social grounds, and should c attention to the harm done to the nation by dishones and untruthfulness; and in such a movement to tra and build up conscience in every department of li the Churches would of course have a part to play. Th idea is surely sound and modern. The B.B.C. has alrea made a beginning, on negative lines, with that excelle series, "Crime Doesn't Pay," which was running l year. The State, by encouraging us to work harder, save, to travel between the rush hours, to stagger o holidays, sneeze into our handkerchiefs, economise fu and keep death off the roads, has already done much build us better consciences, and it might well exp the good work on the lines contemplated by Archbishop.

U.G.C.

THE *University Grants Committee, which was* up in 1919, used to issue quinquennial reports; these were interrupted by the war, and the one publis this week covers twelve years.[1] They were moment years that have brought big changes. "Any concept that may have existed of the universities as places cultural luxury catering for a small and privileged c has passed away and will not return. The heighte sense of social justice generated by the war has op their doors more widely than ever before . . . The p of their development on which the universities are n entering is beset for the moment with obstacles difficulties which are the immediate heritage of the w but it is rich, beyond all precedent, in opportunitie The committee record their view that the principles central planning and academic autonomy are not ir concilable opposites, and they believe that the relat between the universities and the State can be regar as a form of partnership, in which full recognitio given to "the overriding duty of those who follow academic path to ascertain the truth and to procla it without respect to the convenience of Governmen The proportion of university income derived from t State, which was 34·3% in 1935–36, may well be o 60% in 1951–52; and this takes no account of grants building, sites, and equipment, for which the Chance of the Exchequer is prepared to provide £20 milli for 1947–52. The committee, whose 16 members inclu two medical men (Prof. G. W. Pickering and Pr J. C. Spence), describe the principles on which they as intermediaries. In this work they have set n precedents of great value to the nation.

THE KING'S HEALTH

THE following bulletin was issued on Nov. 20:

As a result of relief from walking, standing, and fatig improvement in the general health of the King is appare This is an important factor in re-establishing arterial circul tion to the feet, which is also being encouraged by t appropriate medicinal and physical measures.

In this condition restoration of circulation is a slow proces extending over a period of months. Some improvement h already taken place and there is less cause for immedia anxiety regarding the right foot.

MAURICE CASSIDY
THOMAS DUNHILL
J. R. LEARMONTH
MORTON SMART
JOHN WEIR.

Since Nov. 11 the King has not left his apartments in Buckingham Palace. This more reassuring bulletin was therefore issued after he had had 18 days of rest.

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[12] De Graff, A. C., Batterman, R. C., Rose, C. A. *J. Amer. med. Ass.* 1948, 138, 475.

[1] University Development from 1935 to 1947. H.M. Stationery Office. Pp. 106. 2*s*.

or more, yet from conversations with a fair number of such women one gains the impression that their problems are of a different order. Partly owing to their higher standards of education and of upbringing, they are less often troubled by marital and domestic problems, but when these do occur they cause much emotional preoccupation. On the whole these housewives have higher standards, both personal and objective, in their attitude to life and to work; they also feel the need for interests outside their homes. At present many of them are conscious of a sense of frustration, which may be produced in various ways:

> They lack the time and energy to keep their homes as they would like. They are much more affected by the lack of domestic help than are their counterparts in the working-class; being often untrained to their task they tend to expend much unnecessary energy of body and mind on trivial routine in the house. In some cases they may become obsessed with the importance and urgency of their household commitments, and almost cut off from their former social contacts and recreations. They are thus unable to provide for their families that companionship which is their due. Many of these housewives come to resent their household obligations, and they may develop a sense of conflict between their duties to the house and to the family, doing justice to neither.

Further, there seems to be a definite tendency in the younger members of this group to shirk responsibility for their own lives and families, preferring to impose their problems upon their parents.

Housewives in this group tend to show less defeatism and more common sense and ingenuity in their management of the food problems, though it is often their practice to deprive themselves for the benefit of the family. Again, the younger housewives are more adaptable, more capable, and less inclined to complain than are those over 45. These women are able to have more meals out than are those in the lower income-group, who for reasons of economy or from force of habit have most of their meals at home.

DISCUSSION

The state of health of housewives at present is not good enough for the lives which they have to lead. It cannot be concluded from this short series that there are any specific occupational diseases of housewives, but it is clear that many of the conditions to which they are liable may be considerably aggravated by the circumstances of present-day life.

The chief factors which produce fatigue in the housewife seem to be mental preoccupation of any kind, and inadequate diet. Lack of sleep cannot be incriminated.

The effects of fatigue in the housewife exceed those of fatigue in any other type of worker. They are reflected not only in the woman and her work but also throughout her home and family. It is obvious that the housewife largely determines the atmosphere in her home. Once she is tired, discontented, or frustrated she ceases to enjoy her vocation, and in one way or another she becomes inefficient. As a result it may happen that the husband no longer spends much time at home, and the children often become unmanageable, suffering from the lack of a secure background when it is most needed.

CONCLUSION

It is recognised that no-one can do well if he is not happy in his work, and equally that contentment and efficiency at work can be spoilt by mental preoccupation. This was well seen during the late war, when efficiency was impaired by boredom and anxiety rather than by danger or physical hardship. The vocation of housewife calls for the most natural, as well as for the greatest, of human qualities. A woman can find contentment in her work only if she can approach it with an unpreoccupied mind. Even at this time a good housewife can take her work in her stride if she is trained to her task and happy in its performance. This also implies that she is happy in her marriage, and that all her preoccupations are pleasant ones. The ideal housewife described in the last chapter of *Proverbs* can still be found today.

The need for amelioration in the conditions of the work and environment of the housewife is widely recognised. Of equal importance is the need for every woman—and man—to be equipped by early training and education for the assumption of responsibility in every shape and form as a natural privilege without question or resentment.

My thanks are due to Mrs. Kershaw, almoner of the New Sussex Hospital, and to the hospital staff for their coöperation.

BRITISH ORTHOPÆDIC ASSOCIATION

ANNUAL MEETING

THE annual meeting of the British Orthopædic Association was held in Belfast from Oct. 21 to 23 under the presidency of Mr. S. A. S. MALKIN, who referred in his address to the firm establishment of the specialty during the 1914–18 war, the great advances between the wars and during the late war, and the present flourishing condition which attracted many to this branch of surgery. He thought, however, that the art had been cultivated to the neglect of the science, and that much more attention should be given to clinical and other research in close liaison with the physiologist. The most fertile ideas and research work had come from young men, and it was they particularly who should be encouraged in the research tradition.

THE PAINFUL SHOULDER

Prof. GEORGE PERKINS, opening a discussion on intrinsic pain of the shoulder, referred to invariable complete recovery in capsulitis—a generalisation disputed by subsequent speakers.

Mr. V. H. ELLIS found it difficult to fit such conditions as the stiff shoulder complicating coronary disease into a simple classification of extrinsic and intrinsic causes. He described the production of supraspinatus injuries, and pointed out that loss of power in this muscle might be reflex and recover quickly, or it might result from a complete tear demonstrable by arthrography. Removal of the acromion would facilitate suture of the supraspinatus and hasten recovery.

Mr. J. TULLOCH BROWN (Killearn) had found that, in severe cases of the supraspinatus syndrome, procaine infiltration was useful in distinguishing patients with loss of movement from spasm, requiring conservative treatment in the first instance, from those in whom structural changes demanded operation.

Mr. R. J. W. WITHERS (Belfast) had found 61 cases of capsulitis among 100 patients with intrinsic pain of the shoulder. Two stages might be distinguished: (1) "irritative" capsulitis in which the stiffness was due to spasm and disappeared under anæsthesia; and (2) "adhesive" capsulitis in which stiffness persisted under anæsthesia. Irritative capsulitis was treated by rest in a sling, followed by active exercises at the end of about 6 weeks. Adhesive capsulitis demanded primary manipulation followed by exercises.

Mr. W. C. SOMERVILLE-LARGE (Dublin) spoke of the value of anæsthesia in distinguishing between muscle spasm and structural change as the cause of limitation of movement, tenderness as an aid to diagnosis, and the importance of radiography in various projections.

Mr. STEWART H. HARRISON (Birmingham) had found radiological changes in 30% of patients with pain and stiffness of the shoulder following injury, and had observed that such cases did not completely recover.

Mr. F. A. SIMMONDS (Pyrford) had found in a three-year follow-up that some patients still had slight pain, weakness, and stiffness. Biopsy in the active stage

Diet.—In only 14 housewives was the diet for the day judged adequate, even by present standards. This improper feeding was never attributable to lack of money. The housewife's family always fared much better than she did. Very few housewives took a proper breakfast and supper, and in most the day's food consisted of a cooked meal at midday or in the evening when the family was at home, and snacks at other times. Many women gave up their own rations to the family, but some of those who did not eat properly seemed to lack the inclination for food or the energy to cook for themselves alone. Some women were definitely lazy and only prepared to eat a meal cooked by one of the family at weekends. Throughout the series the consumption of starchy foods was far too high, and most families were disinclined for fish unless it was fried. Very few of the housewives used dried eggs. Mostly their attitude to the planning of meals was one of defeatism and of habit, without the exercise of any imagination. The younger women were more adaptable than the older ones, who had known better days.

Worries.—Only 12 housewives said they had no worries. Each of the remaining 49 had some significant anxiety about marital problems, the family, housing, money, or rationing; and 4 said they were "anxious about everything." The large number of strained tired worried-looking women seen at interviews confirmed the significance of these preoccupations.

Smoking.—There were 27 non-smokers. Of the remainder, only 3 smoked more than twenty cigarettes a day; many were trying to cut down smoking to save money.

Holidays.—There were 17 housewives who had had no holiday since their marriage, and many more had never had longer than a week at a time.

Leisure.—There were 21 women who said they had "no leisure at all." Of the remainder, most were free for an hour or two in the afternoon or evening, but even then they were often occupied with sewing, mending, or knitting.

Recreations.—All but 7 of these housewives went to the cinema, usually once a week but sometimes twice. They all seemed to enjoy this visit, which was the one item that they would not give up to save money. Their reason for enjoying the cinema was usually that it took their minds off their home affairs, but a few women said what they most enjoyed was the chance of sitting down. A few said that even at the pictures they continued to worry about home affairs. They seemed to have no other recreation except 4 women who enjoyed gardening, playing whist, dancing, and listening to music.

CLINICAL FINDINGS

In every case physical examination revealed some noteworthy condition. The most common findings were:

Tired appearance	54
Varicose veins	16
Postural defects	15
Dental and oral sepsis	14
Hallux valgus..	10
Hypertension	10
Obesity	9

A significant degree of anæmia was noted in 4 cases, in each of which the cause was menorrhagia. Nutritional anæmia was not found. Granulopenia was noted in 1 case. Signs of nutritional deficiency, such as angular stomatitis, marginal glossitis, and indentation of the edge of the tongue, were fairly common, but no case of frank vitamin deficiency was observed.

The high incidence of postural defects, foot troubles, varicose veins, and arthritis is not likely to be diminished by standing in queues or by carrying heavy baskets. The question also arises of the possible ætiologica importance of continued anxiety in the production hypertension; it is generally accepted that establishe hypertension may be increased by fatigue and ment strain.

Though only 9 cases of gross obesity were seen, mar more of these women said they had been putting weight in recent years; since most of them contin to take a high-starch diet this is not surprising. Undu thin women were not often seen.

The outstanding impression made by these hous wives was their look of fatigue. This was reflected n only in the face and manner, but often also in al laboured movements and lack of muscle tone. trying to answer questions many women seemed incapab of thinking or speaking clearly, and would make su remarks as: "I can't seem to remember anything th days . . . ." or "I don't know what is happening to brain . . . ," by way of excuse. Many of them had look of defeat. Others looked harassed and ill at ea and admitted that they were thinking of work waiti to be done at home. One woman fell asleep wh she was waiting for five minutes to be examined. M of the housewives were tidily dressed and fairly cle though usually the condition of their hands g away their occupation. Despite their preoccupied a sometimes bewildered looks, many of these women w not without a certain dignity of their own.

When seen for the first time, these housewives were following their usual daily routine. In view of variety of the clinical findings, this fact is remarkab One feels that in other occupations some of th complaints might have been made the excuse absenteeism.

From time to time in the course of this work saw a serene and cheerful woman radiating conte ment and good health; one welcomed her as a rare a pleasant surprise, and invariably found that her ho background was a happy one.

ALMONER'S REPORT

Mrs. K. M. Kershaw reported on interviews with the 61 housewives as follows:

"I have found most of them only too willing to disc their individual difficulties. In my opinion these are divi into marital problems arising mainly through war conditio and problems arising from economic conditions—e.g., housi shortage, rationing, and queueing. The marital proble in many cases had arisen through infidelity of the husband less often of the wife—during the war. In other cases t husband, on demobilisation, was unwilling to take his sha of responsibility in the home. Economic conditi ns complain of were inadequate food, especially where there were growi children in the family. Many women admitted that th regularly gave up their butter, egg, and bacon rations the children. They all complained of having to queue f food, sometimes for as long as an hour.

"The very serious problem of housing is causing considerab anxiety to many housewives, especially in cases where t family have to live with in-laws. One family I visited w living in a damp basement flat, father, mother, and fo children sleeping in one room. For two years they had bee trying without success to find other accommodation. The said that the housing authorities considered their presen flat to be adequate. All these children were unhealthy, th mother was a nervous wreck, and her husband was habituall unfaithful.

"I consider that the most important preoccupation in these housewives has been with problems of marital friction I place housing problems second. The least preoccupation i caused by rationing and 'austerity'; but the women i this low-income group have in most cases been accustomed to hardship all their lives."

HOUSEWIVES IN HIGHER INCOME-GROUPS

Though no detailed work has yet been done on the welfare of housewives in the income-groups of £500 p.a with having been convicted in 1947, and again last July, of driving a car while under the influence of drink. Dr. Glen was represented by Mr. Norman Richards (on behalf of the Medical Protection Society). The council found the charge proved, but postponed judgment for one year.

Francis Murray, registered as of 417, Evelyn Street, London, S.E.8, M.R.C.S. (1930), was charged with having been bound over last June for an assault on his housekeeper occasioning bodily harm. He was represented by Mr. Norman Richards (on behalf of the Medical Protection Society). At the time of the offence Dr. Murray was not practising, and he stated that he would not return to practice until he had completed treatment and had been pronounced fit. The charge was found proved, but judgment was postponed for six months.

William Francis Hirsch Coulthard, registered as of Balwinnam, Aspatria, Carlisle, M.B. Edin. (1927), had had judgment postponed from November, 1946. The council did not erase his name.

William Allan, registered as of 31, Hill Crest, Burnley Road, Sowerby Bridge, Yorkshire, M.B. Glasg. (1926) had had judgment postponed from November, 1947. Judgment was postponed until next May.

In November, 1947, the council postponed judgment on *Hugh Boyd Gillespie*, M.B. Glasg. (1935), registered as of 16, Blairhall Avenue, Langside, Glasgow, S.1, until November, 1949, directing him meanwhile to appear and produce testimonials. This he did.

Restorations

The acting president announced the restoration to the Medical Register of the names of *Alfred Edward Bartley, David Davidson, Zaky Risk, Graham George Robertson*, and *Paravasthu Gopaula Sawmy.*

Council Affairs

Prof. David Campbell, giving the report of the Pharmacopœia committee, stated that 31,215 copies of the 1948 edition had been sold so far. The report of the British Pharmacopœia Commission showed that work had already started on the addenda, which would be issued between 1948 and 1953, and on the next *British Pharmacopœia*, which the council had decided should be issued in 1953.

Dr. Frank Kane was elected to the Pharmacopœia committee by the Irish Branch Council. Dr. Campbell was reappointed to the Poisons Board for a further term of three years.

The Act in Action

3. PHARMACEUTICAL SERVICES

Britain has some 15,000 chemists' shops, served by about 17,000 pharmacists. These pharmacists are now dispensing nearly 100% more prescriptions than a year ago, the increase being accounted for partly by the Act's provision for medicines without charge, and partly by the enforced cessation of dispensing at doctors' surgeries except in some rural areas and for private patients.

At the present rate National Health Service prescriptions would total some 160 million per annum—about 2½ times the 66 million dealt with under National Health Insurance. In England and Wales £1,905,447 was paid out for pharmaceutical benefits up to Sept. 30,[1] but this gives little clue to the charges incurred up to that time. Middlesex Pharmaceutical Committee[2] reports that in its area during July 553,541 prescriptions were dispensed, with a total value of £75,117 (of which £40,036 represented the cost of ingredients, £29,316 dispensing fees, and £5765 containers); the average cost per prescription was 2*s.* 8½*d.* At this average price the annual cost of 160 million prescriptions would be about £22 million.

It has been correctly pointed out that the cost of each prescription is now some 50% higher than under N.H.I.,[3] but a large proportion of the increase is accounted for by improvement in dispensing fees, which have been brought more into line with private dispensing charges. Nevertheless, pharmacists have noted that prescriptions now follow a more liberal trend. Quantities ordered are commonly larger than hitherto—no doubt because the busy doctor wishes to postpone the day when he must see the patient again to give him a repeat prescription. These larger orders have taxed, but never broken, the pharmacist's resources in large bottles. Furthermore, whereas under N.H.I. proprietary medicines amounted to some 5% af all items ordered, they now number about 7–10%; and in a few areas the proportion is said to be much larger. There is also greater readiness to prescribe proprietary preparations in their original packs, the doctor writing simply "1 original bottle of . . ." without further instructions.

As pharmacists see it, practitioners are on the whole using the service judiciously. Exceptionally the amounts prescribed are excessive—for example, a 6-oz. bottle of a vitamin preparation of which the dose is 2–3 drops. Less seldom the prescription is for a proprietary medicine of which there is an efficient non-proprietary equivalent; and sometimes the substance prescribed might perhaps be deemed a food rather than a medicine. Guidance on these borderline prescriptions will probably be given, as the *Pharmaceutical Journal*[4] has indicated, by the joint subcommittee to be set up by the medical and pharmaceutical standing advisory committees of the Central Health Services Council.

Any initial difficulties over supplies have now been overcome; makers and retailers anticipate no serious delays in the future. According to some manufacturers the demand is particularly great for the galenicals; syrups, malt and cod-liver oil, and other medicaments for children; and, to some extent, phenobarbitone. Though often hard-pressed, pharmacists have mostly been able to deal with the new demand without loss of speed. In some ways their work is simplified: proprietaries, of which more are now prescribed, are easier to dispense than individual prescriptions, and whereas private prescriptions have to be copied into a book, N.H.S. prescriptions are simply filed. Nevertheless, the growth in dispensing has made heavy calls on time, and non-professional work now has to be left to unqualified assistants. Pharmacists point out, however, that they cannot altogether neglect the counter: doctors who look in expect to talk to the pharmacist in person; he must supervise the sale of all drugs; and he must see customers seeking remedies for minor disorders and decide whether they should be urged to consult a doctor. One of the present difficulties is over the operation of the rota system. By agreement minimum hours of business are fixed at 9 A.M. to 6 P.M., with one extra hour—between 6 and 7 P.M.—for premises open under the rota system. Since many surgeries do not end until 8 P.M., these premises should, it seems, remain open for anyhow two extra hours.

As secretary of the National Pharmaceutical Union, Mr. G. A. Mallinson points out that the public and pharmacists would be helped if surgeries were begun as early as possible in the evening. At a number of other points integration between doctor and pharmacist is not yet complete. Quite often schedule-4 poisons are prescribed without mention of dosage; and time is then lost to patient and pharmacist while the doctor's instructions are being obtained. A small but important detail is that practitioners very often misuse, or do not use at all, the space left on the N.H.S. prescription form for the patient's age; the pharmacist is then left

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1. *Lancet*, Nov. 6, p. 752.
2. *Pharm. J.* Nov. 27, p. 361.
3. *Ibid*, Sept. 25, p. 209.
4. *Ibid*, Oct. 30, p. 293.

had revealed degenerative changes in the tendinous cuff with a chronic inflammatory reaction but no intra-articular change. The use of a sling and the performance of exercises within the painless range was useful, but he agreed with others that heat was of doubtful value.

Mr. J. R. Armstrong advised excision of the acromion in patients with the supraspinatus syndrome who did not recover spontaneously. He had found a variety of lesions with similar symptoms: supraspinatus tendinitis, partial and complete supraspinatus tears, calcification in the tendon, and subdeltoid bursitis. The whole acromion should be excised.

Mr. G. Blundell Jones (Exeter) referred to acute supraspinatus calcification with sudden pyrexial onset, short course, and early dispersal of the calcium deposit.

Mr. W. E. Tucker mentioned focal sepsis and gout as causes of shoulder pain and agreed upon the importance of rest in the acute stage.

POSTERIOR DISLOCATION OF THE SHOULDER

Mr. C. K. Warrick (Newcastle-upon-Tyne) suggested that with posterior dislocation of the shoulder, unless stereoscopic views could be taken and inspected, the ordinary anteroposterior view should be supplemented by a vertical view with the tube in the axilla, or a vertical view with a curved cassette in the axilla or a profile scapular view.

HIP ANKYLOSIS AND OPERATIONS ON FEMUR

Mr. J. S. Batchelor described removal of the femoral head and neck from 50 hips of 44 patients, with the object of promoting mobility. In 32 a subtrochanteric osteotomy also was performed for the promotion of stability; this might be done at the primary operation with plating of the fragments, or 3–5 weeks later through a separate approach, a tongue being cut in the distal fragment to ensure its engaging with the proximal. After a period of light skeletal traction walking was resumed at 8–10 weeks. Operation had been undertaken for osteoarthritis, ankylosing spondylitis, fracture-dislocation, ununited fracture of the femoral neck, and ankylosis from old acute arthritis and chronic suppurative arthritis. The results were: satisfactory 39; unsatisfactory 10; death 1. Unsatisfactory results included instability (3), pain (3), lack of coöperation (2), restriction of movement (1), and non-union of osteotomy (1).

Mr. H. A. Brittain (Norwich) showed a film of his operation of ischiofemoral arthrodesis. Mr. H. H. Langston (Alton) had performed 30 of these operations, without sciatic nerve injury but with failed union in 5, perforation of the obturator foramen with the graft in 2, and sequestration of the graft in 1.

Mr. W. B. Foley (Oxford) advocated open operation through a posterior incision reflecting gluteus maximus upwards and inwards. Fusion had occurred in 16 out of 17 cases.

Mr. G. K. McKee (Norwich) gave a preliminary communication on the use of a lag screw in combination with cancellous grafting in iliofemoral arthrodesis.

Mr. John Charnley (Manchester) gave an account of preliminary and unsuccessful attempts at arthrodesis by impaction of the tapered femoral head into a hole in the acetabular floor.

Mr. E. Mervyn Evans (Birmingham) had used the Capener nail plate in trochanteric fractures of the femur. Of such fractures 28 % were unstable because of fracture of the cortex in the neighbourhood of the calcar. The advantages of operation seemed to be: greater comfort and mobility, perhaps a lower mortality, and shorter residence in hospital.

Mr. E. N. Wardle (Liverpool) had found aseptic necrosis of the femoral head in 14 out of 46 cases of fracture of the femoral neck, and he advocated that Smith-Petersen nailing be accompanied by grafting.

Mr. A. Chance (Dublin) spoke of intramedullary nailing of the femoral shaft for fracture, the most suitable type being a transverse interlocking fracture of the middle third without any loose fragment. The preservation of knee mobility was excellent.

THE HAND

Mr. W. H. Gervis (Tunbridge Wells) reported on 18 cases of arthritis of the first carpometacarpal joint treated by excision of the trapezium with good results in all cases of osteoarthritis but with poor results in 2 cases of rheumatoid arthritis.

Mr. A. Dornan (Sheffield) had found that in Kienböck's disease conservative treatment usually gave good results; so did excision of the lunate (semilunar) bone, even after failure of conservative treatment.

Mr. Goronwy E. Thomas (Liverpool) had investigated the results of treatment for non-union of the carpal scaphoid bone carried out three years before. The 28 patients treated conservatively had done very much better on the whole than 52 treated operatively, of whom only 7 were able to return to heavy work. Backward subluxation of the lunate bone indicated a bad prognosis.

OTHER PAPERS

Mr. J. Rowland Hughes (Preston) described spontaneous necrosis of the anterior tibial group of muscles, especially the tibialis anterior, occurring as a fatigue condition in young adults or complicating systemic disease. At first, cellulitis was usually diagnosed, but later the group of muscles became contracted, hard, and sometimes even calcified. In the acute stage sections showed massive muscle necrosis like that of Volkmann's disease. The fatigue cases might be caused by arterial spasm possibly promoted by muscle metabolites.

Mr. W. Sayle Creer (Manchester) had successfully treated 14 fractures of the shaft of long bones with boiled cadaveric bone-grafts.

GENERAL MEDICAL COUNCIL

SESSION NOV. 23 AND 24

As recorded last week, Prof. Sydney Smith, chairman of business, presided over the 174th session of the council. Dr. J. J. O'Donnell took his seat as representative of the Apothecaries' Hall of Ireland.

Penal Cases

Mrs. *Ethel Grundy Toward*, registered as of Brookside, Durham Road, Birtley, Co. Durham, M.B. Durh. (1925), was charged with having been convicted on July 19, 1948, of driving a motor-car when under the influence of drink or drugs. She was represented by Mr. L. Mulcahy, Gateshead. The council found the charge proved, but postponed judgment for two years.

Frederic Syson, registered as of 60, Tower Gardens Road, London, N.17, M.B. Glasg. (1925), was charged with having been convicted of various offences in 1945. The council found the charge proved; but on medical evidence that he was unfit to attend, judgment was postponed until next May.

Reuben Denny, registered as of 64, Twyford Avenue, London, W.3, L.R.C.P.E. (1929), was charged with having been convicted last August of being in charge of a motor vehicle when under the influence of drink. The council found the conviction proved, but postponed judgment for one year.

Arthur Mervyn Rhydderch, registered as of Coppelia, Clements Road, Chorley Wood, Herts, M.R.C.S. (1920), was charged with having been convicted on three charges of driving and being in charge of a motor vehicle while under the influence of drink. He was represented by Mr. W. E. D. Churcher, of Messrs. Virtue, Son, and Churcher. The charges were found proved, but judgment was postponed for two years.

William Melrose, M.M., registered as of 15, St. Paul's Square, Liverpool, L.R.C.P.E. (1924), was charged with having been convicted, at Liverpool, in 1940, and again last July, of driving a motor-car while under the influence of drink. Dr. Melrose was represented by Mr. Joseph Norton, of Liverpool, instructed by Mr. A. Shaw. The council found the charge proved, but postponed judgment for one year.

Archibald Thomas Macmaster Glen, registered as of 16, Telford Avenue, London, S.W.2, L.R.C.P.E. (1935), was charged ment by excessive salivation was to become the greatest tribulation of my life. In the kindest and most gentle way he told me what I was suffering from. In a way it was a relief to know something definite.

Things went from bad to worse, and I had difficulty in memorising my patient's faces and what I had prescribed for them. Deciding to give up my practice and go back to the Navy—my first love—I went to the Admiralty for medical examination, and felt guilty enough at putting my signature to a written statement that I was free from physical disability. In this early stage I could easily have fooled the whole Royal College of Physicians. But life on a submarine depot-ship, spending hour after hour with nothing to do but just sit and think or perhaps listen to Service jargon—proved an impossibility for me. I lasted just a couple of months, then collapsed and was invalided out of the Service.

This just about finished me, and I found it beyond my powers even to think of a job of work. In the backwater of a village, with my wife and child, life became happy; and in the winter months I enjoyed rough-shooting, though slow on the trigger. My age was now 34. Then tremor and salivation began to trouble me. The embarrassment of excessive salivation is comprehensible only by those who have suffered it; it is very trying to have one's mouth perpetually full of fluid, waiting to spill over at the slightest relaxation of the facial muscles. My brother put me on a proprietary preparation of scopolamine, which for years acted like a charm, drying up the mouth, reducing tremor, and making me feel fairly well. But as time wore on it lost its almost magical effect, which has never returned: I was now treated with a preparation of stramonium, which still has a remarkably consistent action. Unfortunately it takes an hour to act, and in that time there is an almost overpowering temptation to hurry things up by taking a little more. The result of an overdose is devastating: a bone-dry mouth, a [illegible]ble heart-beat, a feeling of distress, and hysteria producing an exaggerated sense of humour, though in the background all the time is a sober awareness. If, on the other hand, I take too little, salivation deluges me. It is remarkably hard to strike a happy mean, for the path between the two extremes is very narrow. Owing to the atropine in stramonium, the pupils dilate, and strong glasses are needed. Before a fire the heat is sufficient to dry up the conjunctivæ and the upper lid tends to stick to the eyeball. This is sometimes quite painful. The trouble is alleviated by a kettle steaming on the hob, or a dish of water placed before the fire.

Gradually difficulty in swallowing has manifested itself; it is impossible to get down any food without copious draughts of water, and even this does not always work. I never take a meal with any but my own family, for eating demands my whole attention. Though right-handed, I use a fork in the left hand (the less affected) for almost all varieties of food; a fork is much easier to manipulate than a spoon. Crisp dry food is the most readily masticated; anything that cloys is anathema. 'Ryvita,' recrisped in the oven, is ideal. Of a different texture, sponge-cake is also excellent, seeming to dissolve in the mouth. A satisfying meal entails an hour's hard work. One of the greatest irritations is the inability, through being unable to swallow quickly, to join in the conversation, however trite my unspoken comment. By the time I have swallowed the talk has swung on to some fresh subject.

My speech has become indistinct. Until I got used to it, this caused me great annoyance. How maddening it is to receive a grotesquely irrelevant answer to some simple remark, from someone trying his best to understand. How much better it would be if he said that he did not comprehend. My latest affliction is an ability to walk well—the "festinating gait." This is much worse indoors, when my way is beset with many corners. Once on an open road I can get along with a certain ease: but there are ominous signs that this will not last. Curiously enough it is easier to walk backwards than forwards.

For the last twenty years I have been writing, punching the typewriter with my left forefinger—the only digit of the ten that will perform this duty. Free-lancing is surely the most disappointing of all occupations. I must have had some two hundred articles rejected; but slowly my name is getting known, for I seem just now to be selling two articles a month, and two plays have been accepted by the B.B.C.

This tremendous interest keeps me going; but a snag—inevitably, I suppose—has recently developed. I can no longer type with any ease or dexterity, my one good finger refusing to function. This is really distressing but, as nearly always happens, there is a way out. In America they are manufacturing an electric typewriter, which at the softest touch does everything, even rolling on the paper and shifting the keyboard; but naturally it is expensive.

I have to fight my own peculiar demon—the devil of frustration. Everything is difficult to accomplish; little details which come like second nature to the normal person are a series of puzzles to me; and sometimes there is no solution. Putting on clothes, doing up shoelaces, fastening shirt buttons, holding a cup of tea without its slopping over—all these are obstacles in the routine of life. Some of these things have to be done for me.

So here I am, at the age of 55, with difficulty in walking, talking, eating, writing, and typing, with a whole host of minor ailments; yet a happy man with dozens of compensations. How has this disease affected my character and temperament? All for the better, I think. I can bear the keenest disappointment with almost complete equanimity; this happens two or three times a week when those big buff envelopes, addressed by myself, pass through the letter-box, and also when some new disability asserts itself. I am now much more sympathetic and can better understand other peoples' foibles, peculiarities, bothers, and ailments.

My belief that man possesses a separate entity apart from his husk of a body has been greatly strengthened by my experiences. I sit, as it were, inside my carapace watching my person behaving in its vile fashion, while my being is a thing apart, held a prisoner for a time. This rather queer sensation of being outside oneself has been exaggerated by my complaint: it is most comforting, and strengthens my faith that there is not complete extinction ahead, but a better deal in a new life.

"We may observe that Governments are not infallible, yet must be obeyed. This reflection should make us more than ever alert to preserve intact the prized freedom of science in our own domain. Actually no direct attack is likely here, and should the unexpected happen it will certainly not be along the lines of compelling us to espouse some particular scientific theory or doctrine. Conceivably it could take the more subtle form of control of the character and direction of our scientific work. There is immediate danger in the current deprecation of fundamental research, not of course absolutely, but relatively, in comparison with technological applications. . . . It is certainly not sufficiently realised that the body scientific can only flourish when all its organs are in a healthy condition. As in a biological equilibrium there is a natural interdependence between pure and applied research. Pure science is fertilised by the advance of technology and vice versa. It would be quite consistent, though lamentable, to take up the position that we will have no more research at all and devote our energies to the exploitation of present knowledge. But it is impossible to dissect the elements of real progress. If we isolate one of the limbs of the organism it will not grow and will soon die."—Sir ROBERT ROBINSON, P.R.S., in his anniversary address to the Royal Society, Nov. 30.

in doubt whether the preparation is for child or adult. Then again the prescription form is still used for all manner of articles not included in the schedule of appliances. This gives rise, as Mr. Mallinson points out, to time-consuming telephone calls between pharmacist and doctor. Doctors who have hitherto done their own dispensing have commonly used concentrated proprietary medicines which they diluted before handing out to the patient; now the pharmacist finds that he is required to stock a number of these mixtures to satisfy the habit of each practitioner in his neighbourhood. More serious perhaps is the situation over new proprietary medicines. Representatives of drug firms call on doctors, arouse their interest in a new preparation, and then warn the local pharmacist that some should be ordered. This the pharmacist does; the doctor prescribes the medicine once or twice only; and at the pharmacist's half-dozens of proprietaries pile up, unused, and forgotten by all except the pharmacist himself, who has paid for them.

The pharmacist's principal trouble just now is over delay in payment of his accounts under the N.H.S. This delay, which is very much worse in some areas than in others, will doubtless be reduced; but in the meantime it is making heavy inroads into capital. Pharmacists recognise that the terms offered under the Act are an improvement on N.H.I. conditions, but there are various anomalies which they hope to see rectified. For example, they would welcome a greater share of dispensing in rural areas, where, they hold, they should also receive a delivery allowance so that the patient in urgent need who has no messenger can be assured of getting his medicine. It will be a year or more before the effect of the Act on the pharmacist's earnings can be gauged. Against the gain represented by a greater total of prescriptions dispensed has to be set the reduction by 50% or more in private prescriptions, which are more profitable to him than those dispensed under the Act. According to some central bodies over-the-counter business is now reduced, but this is denied by individual pharmacists interviewed; they say that possibly the increase perceptible up to July 5 is slightly slowed, but there is no actual reduction. For the more expensive drugs patients are certainly now referring more often to their doctors for a prescription, but for the "homely" remedies the demand is unabated, patients continuing as before to purchase these privately.

Will pharmacists be able to meet every call this winter? A little hesitantly they answer Yes. One large firm has created a pool of volunteers who will go to any area where the need is particularly great; but though this precaution is an effective cushion against local stresses, it will of course be ineffective in an over-all epidemic. Some pharmacists are trying to improve speed and efficiency by enlarging their dispensaries and—in the larger premises—by getting patients to bring their prescriptions to a single desk where a pharmacist can rapidly decide how soon these can be made up. At least one firm has established a bonus system for the dispensing pharmacist. This firm has always been extremely considerate to its employees; but the addition of the bonus is thought to have had an appreciably good effect. Nothing can disguise the need for more dispensers. Mr. Hugh Linstead,[5] secretary of the Pharmaceutical Society, has lately returned to the suggestion of "more regulation of unqualified labour," arguing from the analogy of laboratory technicians. Here the example of Messrs. Boots might perhaps be copied. This firm trains—allowing time for study—not only indentured pupils but also (provided they are of good education) unindentured pupils, who take exactly the same course of study and are encouraged to continue and qualify as pharmacists. For the indentured pupil there are scholarships, and there is a fund to help all worthy candidates.

Most pharmacists in retail business in England and Wales have high hopes that their work will be made easier by the introduction of the promised *National Formulary*; looking further ahead, they regard with unconcealed dismay the prospect of dispensaries in health centres.

Disabilities

18. EFFECTS OF ENCEPHALITIS LETHARGICA

SLEEPY sickness is perhaps one of the cruellest afflictions to be endured by man. Though myself a doctor, I know little about the pathology of the disease; and indeed I have no knowledge of its clinical course or ultimate end, beyond the sequence of events that have already befallen me. I make no inquiries, nor do I dip into periodicals and books dealing with the complaint; for it is foolish, in my estimation, to anticipate what may never happen.

"Creeping paralysis"—the title already given to another disease—would be an excellent name for this disability, which drags unrelentingly along its laborious course. It is quite impossible to say "I'm worse than I was a week or a month ago." It is necessary to look back much further to recall little things that could once be managed but are now impossible or very difficult.

I am supposed to have contracted the disease in 1924, when I was 29. I ran a temperature for a few days and saw double for a week. This diplopia rather alarmed me at the time, but a brother houseman reassured me by saying that this phenomenon indicated only fatigue of the eye muscles, which was to be expected in any febrile condition. Previously the Navy had claimed me for eight years, but now I went into general practice at a seaside town, where I joined the local sailing club.

It was while sailing that I got the first inkling that all was not well with my make-up. Several boats had reached a mark-buoy round which it was necessary to gybe—a tricky moment, which would have disturbed the most hardened seaman, for a general smash-up seemed inevitable. Suddenly my hand started to vibrate on the tiller; it was a most curious sensation though only momentary. I mastered myself, regained my grip, both mental and physical, and steered round the buoy without incident.

Another warning came a few days later at a public luncheon. I was on my feet, proposing a vote of thanks to the speaker, when my right hand started to vibrate again. I havered a bit, rammed my hand into my trouser-pocket, and continued. I don't think anyone else noticed the contretemps. Some time after this I noticed that it was becoming difficult to write, quite a short letter taking a considerable time; and my handwriting, which always had been a bit of a puzzle, became completely illegible. Soon I lost my nerve for the excitement of sailing. There is always a spice of danger in navigating, even in local waters; and competing in the single-handed race—which I myself had instituted—became for me a most alarming affair.

At this stage I consulted my brother, a general practitioner, who arranged for me to see a London neurologist. The three of us rendezvoused at the great man's country house; and without my knowing, he diagnosed my ailment over the teacups. Afterwards he took me for a stroll in the garden. I remember he asked me if my mouth seemed wetter than usual. I answered No. Little did I realise that as the years

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[5] *Chemist and Druggist*, Nov. 13, p. 642.

Letters to the Editor

DIETARY FAT

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Regarding the first point, he avers that the fat intake of the Swiss was 40–50 g. daily for just over a year during the war period. It is clear, however, from Fleisch's [1] graph that the *average* intake for the normal consumer was less than 50 g. daily for approaching three years. While supplementary rations were granted to certain groups of workers, I presume Fleisch is referring to the bulk of the population when he states in his summary, "We have lived for years with [illegible]0–50 g. fat."

Dr. Leitner then states that in a properly balanced diet the absorption of the fat-soluble vitamins and of calcium and phosphorus depend on adequate fat intake. It is true that fat promotes the absorption of such vitamins, but is the improvement of quantitative significance? Drummond [2] considers that there is no indication from war-time records that subsistence on diets poor in fat accelerated the appearance of signs of a deficiency or aggravated them. Since the calcium metabolism of the human body reaches a steady state slowly with changes in diet, only long-term balance observations are of value in absorption studies [3]; the effect of high and low fat intakes on calcium absorption under these experimental conditions has not yet been investigated, so far as I am aware. But surely of greater moment are observations such as those made by Wilson and Widdowson [4] in India; they found that although the people in the Central Provinces and Orissa consume only 0·2 g. calcium and about 12 g. fat daily, little or no rickets or osteomalacia are found. It may also be of interest to add that at this laboratory balance observations on a small number of healthy young Bantu when living on their customary diet (about 0·3 g. calcium and [illegible] g. fat) showed them to be in equilibrium in regard [illegible] calcium: further, X-ray studies revealed their bones have normal calcific density. Evidently at such places very low fat intake does not prevent a proportionately meagre calcium intake from being effectively assimilated. Since it is unusual for diets to be deficient in phosphorus, in contrast to calcium, the effect of different levels of fat intake on phosphorus absorption need not be considered here.

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1. Fleisch, A. *Schweiz. med. Wschr.* 1946, p. 889, fig. 4.
2. Drummond, J. C. *J.R. Soc. Arts*, 1948, 96, 569.
3. Steggerda, F. R., Mitchell, H. H. *J. Nutrit.* 1941, 21, 577. Kraut, H., Wecker, H. *Biochem. Z.* 1943, 315, 329.
4. Wilson, D. C., Widdowson, E. M. *Indian med. Res. Mem.* 1942, no. 34.
5. Elvehjem, C. A., Krehl, W. H. *J. Amer. med. Ass.* 1947, 135, 279.
6. Forbes, E. B., Swift, R. W., Elliott, R. F., James, W. H. *J. Nutrit.* 1946, 31, 203.
7. Forbes, E. B., Swift, R. W., James, W. H., Bratzler, J. W., Black, A. *Ibid.* 1946, 32, 387.
8. Burr, G. O., Barnes, R. H. *Phys. Rev.* 1943, 23, 256.
9. Lewis, T. Pain. New York, 1942.
10. Richards, R. L. Peripheral Circulation in Health and Disease. Edinburgh, 1946.
11. Shumacker, H. B., Speigel, I. J., Upjohn, R. H. *Surg. Gynec. Obstet.* 1948, 86, 452.

In England Now

A Running Commentary by Peripatetic Correspondents

"CORSE," said No. 20, as he passed my bed on his way to the bathroom, "the doctors can't know everything. You've got to be a gastric yourself to know what's going on inside. As I see it (and I've read about it in them medical books), the gas forms in the ulcers in this 'ere duodenal cap, and every now and then it lifts the top off 'em and that's when you get the pain. You can 'ear the gas rumbling round, and if you bring it up you feels better. But that's the trouble—to get it up. I've tried everything, but when one of these attacks is on nothing will shift it. Then again, in a week or two, it begins to move and after that it comes up lovely."

"One thing," he went on, when I had expressed agreement, "they've confirmed that I 'aven't got the T.B. I'll show my daughter the report when she comes and then perhaps she'll believe it." His skinny old face wrinkled up, showing an assorted collection of blackened false teeth. "I first went round to the clinic on account of getting so thin. I 'ad a bit of a cough, too, but I didn't tell the doctor there about my gastric—he only asked me whether I'd coughed up blood and that kind of thing. I 'ad the X ray and when I come up later to 'ear the result 'e took another. 'E looks at the pictures a long time and then 'e says 'I'm sorry, but you've got the T.B.' Corse, when I told the missus she was in a proper flap—made me keep to my own cup and plate and I've kept to 'em ever since. What with children and grandchildren there's about 40 in our family, so you 'ave to be careful. I went back to work, but next week the Care Committee sent me to Fergushill 'Orspital, the T.B. place. It was full of Service chaps then. Four months I was in there, and never 'ad no treatment. A nice old doctor come round every morning and asks 'How're you?' and when we says 'All right' 'e passes on to the next bed; 'e never looked at none of us. We 'ad grand grub—cream, and cod-liver oil and malt, and what else—and I got quite fat. Then one day a new doctor comes round, a young chap what 'ad been at one of these sanatoriums and knew all about T.B. 'E examined every one of us, thorough, stomach and all. When 'e'd finished with me 'e says to the sister: 'What's this man in here for? There's no T.B. there. He can go home.' Another chap what 'ad been in the ward longer than me 'e found 'ad a growth on the lung. When I got 'ome I used to go to the clinic every six months as they'd told me, but I didn't tell them what the 'orspital doctor 'd said—I didn't like to some'ow, seeing as 'ow they'd given me an allowance all the time I was in there. The sister would say, 'You're doing very well, dad,' and I would think so I ought to be, since I'd nothing the matter with me chest. It just shows, don't it, that they can make mistakes with them shadders on the lungs?" He wrinkled again and trundled his chair down the ward.

* * *

After your leader on Hospital Manners, I feel it is fair to send you the reason—given in a letter to our almoner—why the doctors and nurses "don't tell you anything." They just can't get at the facts, and nor can the mothers-in-law.

DEAR MADAM,—I do hope you will not mind me writing to you again, but my little grandson was in the Radcliffe, I was informed while in Oxford and I ask the person what was the matter she said *she did not know for certain* but the Rumor had gone round that he had stoppage through constipation but she did not know how true that was, and of course it upset me and I felt quite ill while at the baby great-grandmothers, I did not know what to do for a time, then my daughter-in-law wrote and told me, that the baby was taken ill with pains in the stomach and was sick and had hemarage in the back passage, he was sent to Radcliffe and she informed me if they could find the lump they would oprate, which they did, now they have wrote and said he is out of hospital and said it was his pipe where the food went Down was to narrow in one place he was alwright when he drank anything but when he had Solids it use to block his feed pipe up, but as you know my daughter-in-law told me several Different Storys about herself that you cannot rely on her for the truth, she as told me one story about baby and Relations another and to be on the safe side, I would like to know the truth, for she as blamed it on to several different things at Different times in her letters so I hope you dont mind me asking you

* * *

Dear Mr. Attlee,—Perhaps you are not really responsible for the practice of putting the clock back, but I have to blame someone. The farmers, I believe, have always opposed this jiggery-pokery, and as a father perhaps I may add my humble plea.

Ever since the clocks were fiddled, my two small boys have been awake at 5.30, and that means no more sleep for Father. They play for a bit and then the elder one gets fed up and takes to tormenting the younger. On the second day, after many threats, Father eventually leapt from bed, beat them somewhat unsatisfactorily as there was no bare skin to get at, and flung them into their respective beds. Breathing fire, he hissed through clenched teeth that if they continued to cry they would be beaten again. They pursed their lips, but continued awhile in muted fashion.

This Victorian approach certainly bore fruit, and though Father is still woken at 5.30 they are a little more circumspect in their behaviour. Heaven knows what complexes have been formed to mar their future happiness. Father's nerves are getting decidedly frayed, for, not being a Napoleon, he needs more than six hours sleep.

What makes this particularly hard to bear is the knowledge that the situation will repeat itself throughout the years. As soon as the boys begin to settle down the clocks will be fiddled with again, and whichever way they are changed the result, strangely enough, is the same.

Multiply all this misery a million times, Mr. Attlee, and you will have some idea of the magnitude of this orgy of human suffering. All I ask is that, when at last we reach the age of plenty, we should dispense with this man-made burden. But I don't know; but then the little devils will have children of their own, and why should they not suffer as they make us suffer now?—Yours &c., P. Familias.

* * *

But surely it is better than (Churmann and AcNab 1933, Rieberg and Oss 1934, Allory 1936, Anny 1940, Aln 1941, Oschcowitz 1945) this, don't you (Yatt, Icks, and Hompon 1936, Olbrook and Ill 1936, R[illegible] and Aug 1936, Teck, Eutsch, Eed, and Truck 1937, Brams and Auer 1938, Teinberg 1938, Locumb 1938, Reyberg 1942, Anavski, Inkler, and Eters 1945, Reeman, Hoads, and Eager 1946, Ovey and Hitlock 1946, Aul 1946, Evans and Aylor 1941, Aufmann, Eck, and Iseman 1947, Agnuson, Elvenny, and Ogan 1947) think? Not exaggerated.

* * *

Do the anatomists know what the war has done to women's hands? I do not refer to roughened skin, stains, cuts, broken nails, but to size. Work develops the muscles and broadens the hands, but I maintain that the bones in mature adults are hardly likely to lengthen. The manufacturers of gloves and the shopkeepers who sell them seem to think otherwise; the leading drapers in my district assert that unaccustomed rough work in house and garden has enlarged hands to such an extent that no gloves smaller than size 6½ need now be made. Only ocular demonstration would convince them that a hand that took size 6 before 1939, and that works as hard as any other, still takes 6, and looks ridiculous in 6½, with flapping finger-tips like a stage comedian. After several enjoyable chats between the saleswomen and myself it was finally announced that some day three pairs of gloves size 6 will be included in "the quota."

The fact must be that the hands and feet of the younger generation of women and girls, like their bodies in general, are larger than those of their mothers and grandmothers. Sir Grafton Elliot Smith used to teach that increased use of the hand led to increased differentiation of the small muscles and stimulated cortical development; though I have heard it suggested that it was the other way round. It would be interesting to hear from the psychologists whether increased size is correlated with greater intelligence.

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ACCIDENTAL INTRA-ARTERIAL INJECTION OF DRUGS

Sir,—Dr. Wyburn-Mason's appetite for contentious argument is a healthy one; not content with the solitary bone, he now desires to pick an entire skeleton—vasodilator nerves, causalgia, ophthalmic zoster, and "belligerency" are some of the new bones. He complains that I have "misconstrued" what he said. I wish that I had the temperament of that old surgeon, John Murphy, and could be content to let it stand, and "let the record show." But in the language of Oscar Wilde, I can resist everything except temptation. I shall deal with only a few points.

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But I hope that it is not being suggested that the thiopentone injection was into the posterior nerve-root, or that the œdema twinkles up and down the nerve-sheath. Such vasodilatation only follows posterior nerve-root stimulation; the effects are entirely different on stimulation of the peripheral nerve pathways with which we are here concerned. At this stage the nerve has received its vasoconstrictor component, and with stimulation the vasoconstrictor effects predominate. Moreover, neither in man nor in animal has it been possible to produce œdema following such stimulation; the erythralgic skin of herpes and causalgia is an affair of days or of weeks, and does not come on in a matter of minutes or hours. These two statements come with the full authority of Lewis.[9]

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I am beholden to Dr. Wyburn-Mason for his suggestion that I read A. D. Speransky *Basis for the Theory of Medicine* (1935), for information as to the identical effects of injection of irritants in animals. But, having studied the records of some of the experiments performed, I came away with the conviction that one can gather everlasting converts to every crude suggestion. May I quote three extracts.:

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[9] Lewis, T. Pain. New York, 1942.

[10] Richards, R. L. Peripheral Circulation in Health and Disease. Edinburgh, 1946.

[11] Shumacker, H. B., Speigel, I. J., Upjohn, R. H. *Surg. Gynec. Obstet.* 1948, 86, 452.

> "Trauma of the sciatic nerve sometimes produces trophic ulcers of the hind extremities and sometimes papillomatosis of the mucous membrane of the mouth."
>
> "As a matter of fact who would have believed, even recently, that it is possible to blind a dog by acting upon the sciatic nerve, or to kill an animal through the pulp cavity of the tooth, producing intestinal hæmorrhage by means of one drop of formalin, two or three months after, not only the formalin, but the tooth itself had been removed."
>
> Two dogs are pictured with gangrenous ulcers on the hind extremities, "after section of the sciatic nerve and injection of a drop of pus in the centrifugal end (with subsequent extraction of the cerebrospinal fluid)."

Sir, when truth jostles fiction, those who try to part them oft buffet one another, be it with tongue or pen. There was a worthy biblical injunction in your last issue: "A soft answer turneth away wrath."

London, W.1. **SOL. M. COHEN.**

HOSPITAL BIOCHEMISTS

SIR,—May I be permitted to comment on a recent advertisement in your columns? The post advertised was that of a hospital biochemist, and the salary offered was (*a*) for a medical graduate with *experience* in biochemistry £1500 per annum subject to possible increase under the new scales, or (*b*) for a science graduate £750–1000 according to age and experience.

If the larger salary were being paid to a fully trained chemist (at least to M.SC. standard) who also possessed a medical degree, this letter would not have been written. However, according to the advertisement this need not be the case. I may be wrong, but I consider that to carry out his duties a hospital biochemist should be first and foremost an efficient and fully qualified chemist. If he is also medically qualified, so much the better; but I am at a loss to understand why a medical graduate with a limited knowledge of chemistry is worth at least £500 per annum more than a chemist with a limited knowledge of medicine. **PH.D.**

TESTING ANALGESICS

SIR,—The work on quantitative evaluation of analgesics both in this country and in the United States has revealed great variations in pain-threshold values, even in the same individual under identical experimental conditions. Two factors are worth noting as having a limiting value upon the interpretation of the action of analgesics: one is neurophysiological and the other pharmacological.

Relief of pain may mean a reduction of (*a*) peripheral reception (nerve-endings), (*b*) neural transmission (including the spinothalamic tracts), (*c*) central pain perception. Analgesic action is fairly clear-cut when it results from the elimination of pain reception and from interference with neural transmission, but when it comes to central pain perception we are dealing with a composite cerebral entity. Its component parts—the thalamus, the hypothalamus, and the cortical somæsthetic area—play their various rôles in the formation of psychic, somatic, and autonomic reactions. The interrelationship of these cerebral components makes for interdependence of the reactions.

There is no evidence that analgesics of the phenanthrene derivatives, the barbiturates, the anæsthetic gases, the antihistaminics, procaine, and so on, have all got a central, global, uniform, and therefore comparable action. On the contrary there is some evidence that these widely differing drugs have to a degree a preponderantly selective action—viz., cortical or diencephalic. Apart from pain-threshold-raising influence, there are the degree of involvement of the autonomic system, different degrees of respiratory depression, different ways of losing consciousness or producing lethargy and sleep. Thus the site of action of these numerous drugs is unlikely to be either identical or total within the brain.

With these reservations the term "analgesic" is useful clinically, but less so for the purpose of precise estimation of their action.

London Hospital. **BERNARD KENTON.**

CONTRACEPTION IN GERMANY

SIR,—I regret that my letter of Sept. 11 contained an error of dictation, when I said that contraception was forbidden in the British and American "zones." I should have said British and American "sectors" of Berlin.

I am also informed by the public-health division of the Military Government that "there are no restrictions whatsoever." The position, however, is still obscure because the Himmler police ordinance forbidding contraception has never been officially repealed, although the Hitler laws in general have been annulled. Confusion arises, therefore, as to the exact legal position. I understand from various sources that in actual practice, since the reduction of the censorship, the Himmler laws have been disregarded, although not repealed. Nevertheless the fact remains that, for whatever reason, contraceptives, certainly up till September, were almost unobtainable under Allied rule in Berlin.

According to my information, contraceptives sent through the post (unless in considerable bulk) are now unlikely to be stopped.

Urmston, Lancs. **BERNARD SANDLER.**

A REGISTRARS' GROUP

SIR,—A Registrars' Group has been formed in the Liverpool region to discuss conditions of service under the National Health scheme. We would be interested to hear if such groups have been formed in other regions as we consider that interchange of ideas on this subject would be of great value.

Ingleside, Hightown, near Liverpool. **W. H. R. COOK.**
Ashley, Reservoir Road, Prenton, Birkenhead. **C. S. MCKENDRICK.**

HOME NURSING OF PREMATURE BABIES

SIR,—I was interested in Dr. Miller's article of Oct. 30 on home nursing of premature babies in Newcastle-on-Tyne. He expresses the hope that the experience of others will be recorded. The accompanying table gives the figures of premature babies born and nursed at home, in comparison with those born and nursed in a hospital, maternity home, or nursing-home in the West Riding (1945–47) and in Warwickshire (1943–44),[1] in comparison with the figures for Newcastle.

C. FRASER BROCKINGTON
County Medical Officer, West Riding of Yorkshire.
Wakefield.

Weight (lb.)	Newcastle-on-Tyne 1945–47				West Riding 1945–47				Warwickshire 1943–44			
	Home group		Hospital group		Home group		Hospital group		Home group		Hospital group	
	Births	Deaths	Births	Deaths	Births	Deaths	Births	Deaths	Births	Deaths	Births	Deaths
→ 2½	36	35 (97 %)	33	33 (100 %)	85	80 (94·1 %)	38	37 (97·4 %)	16	14 (87·5 %)	25	21 (84 %)
→ 3½	52	32 (61·5 %)	53	35 (66 %)	198	144 (72·7 %)	72	42 (58·3 %)	24	14 (58·3 %)	55	44 (80 %)
→ 4½	124	22 (17·8 %)	117	23 (19·6 %)	369	138 (37·4 %)	231	66 (28·6 %)	54	14 (25·9 %)	125	21 (16·8 %)
→ 5½	167	14 (8·4 %)	334	14 (4·2 %)	1032	99 (9·6 %)	828	52 (6·3 %)	67	10 (14·9 %)	297	19 (6·4 %)
All weights	379	103 (27·2 %)	537	105 (19·5 %)	1684	461 (27·4 %)	1169	197 (16·9 %)	161	52 (32·3 %)	502	105 (20·9 %)

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[1] Brockington, C. F. *Arch. Dis. Childh.* 1944, 19, 93; *Publ. Hlth, Lond.* 1945, 58, 101.

THE VOCATION OF MEDICINE

SIR,—In reply to the letter from Drs. Brockington and Lambert in your last issue, I was not aware that the term public health was a synonym for "social medicine." Had I known that it was used in this sense I should have said "You can engage in those branches of medicine in which the doctor does not make direct contact with the patient."

HORDER.

THE UNIVERSITIES AND THE HEALTH SERVICE

SIR,—Professor Dible in your last issue makes an important protest against the volume of routine and administrative work which medical professors are expected to perform to the serious detriment of some of their more important duties. He rightly says that this state of affairs has been aggravated by the advent of the National Health Service, but it is important to realise that most of it existed long before—at any rate for the clinical professors. It is part of my conditions of service with the university that I take charge of a medical unit at the hospital, for if I am to conduct clinical teaching and research I must surely take clinical responsibility. The inpatient and outpatient teaching which goes on all the year round was traditional long before the National Health Service was ever contemplated.

Professor Dible wisely says: "If a choice is to be made between on the one hand the large financial gains offered to hospital specialists . . . and on the other the status and emoluments of a professor *with the traditional freedom and privileges of that office* [italics mine], even at a much lower salary, I should not hesitate to accept the second." Nor would I. But there is not the slightest likelihood that for the clinical professor such a choice will ever exist. I cannot shirk the responsibilities of being a medical specialist by the mere refusal of a salary, because my ultimate responsibility as a clinician is neither to the hospital nor to the university but to my patients. If I could find some way of evading that responsibility I should cease to be a suitable person to teach young men and women to be doctors. Working at a lower rate of pay will not prevent my hospital and university colleagues and doctors and their wives from seeking my professional advice, nor will it relieve me from being a member of senate and faculty and innumerable committees. We already know by experience of such régimes that the work will be precisely the same in nature, hours, and responsibility, whether paid for by the university or by the National Health Service. And in either case the university will expect us to play a part in the government of the teaching hospital to which we are attached. And so, if we should be given the choice of alternative rates of pay, to take the lower would be a gesture of sacrifice which would merely perpetuate our place in the hospital as the poor relatives of our colleagues, while having no other effect but to prevent any further recruitment to clinical chairs.

Manchester. ROBERT PLATT.

THE GENERAL PRACTITIONER

SIR,—I have just read your special article of Nov. 20, and from my own experience as a general practitioner I differ so much on many of the points raised that I would like to set down some facts as I see them. I should say firstly that, though I have never been in favour of the National Health Service, I have not allowed prejudice to lead me into exaggeration.

The article states that "the public has welcomed the new service . . . both doctor and patient are pleased with their new and easier relationship." I find a large proportion of my patients have not welcomed it, and express a feeling of embarrassment at calling me in: many wish to continue paying fees while taking advantage of the "free" medicines. I too think that patients wishing to remain outside the service should obtain drugs without charge.

Though autumn is normally a slack season, I am doing twice the number of visits that I did at this time last year. The article says that the numbers attending surgery have risen by between a quarter and a half: well, I must live in a peculiar district, for my surgery attendances have trebled.

I am afraid I have not become conditioned to filling in certificates, and do not ungrudgingly write them for things such as extra coal, new houses, telephones, corsets, and brassières. The certificate O.S.C.1. is, I agree, a pointless farce: I have thought of placing a number of these, already signed, in my waiting-room under a notice inviting patients to help themselves and so save my time.

The statement "to the doctor's wife the new régime has made little difference" I showed to my housekeeper who deals with the telephone and door work; her remarks were pointed and unprintable, and to put it mildly and colloquially she is thoroughly "browned-off." With regard to the terms of service I can only say that my income will be reduced by a third and my work very considerably increased.

I may be wrong but I cannot believe that my experience is not similar to that of many other doctors and that it is peculiar to the district in which I live, a residential (not rich) suburb on the outskirts of London.

A. G. WESTON.

VEGANIN

SIR,—In the course of his article of Nov. 13, Dr. Asher writes: ". . . tab. codeine co. (N.W.F.), which is perhaps better known as 'Veganin'." We would point out that this is a complete mis-statement. Tab. codeine co. is the N.W.F. equivalent of the original aspirin-phenacetin-codeine compound tablet sold under the registered trade name 'Veganin,' but the formula is not identical and the performance is usually very different. In a later passage, it is made clear that tab. codeine co. is the tablet referred to, yet lower down 'Saridone' is again compared with 'Veganin.'

Unfortunately, too often our trade-mark 'Veganin' is misused, and when the tab. codeine co., which is supplied under this name, fails to give as much relief as might be expected from 'Veganin,' this reacts unfavourably on our goodwill.

William R. Warner & Co. Ltd.
Power Road, London, W.4.

ELIOT WARBURTON.

MATERNITY

SIR,—In your leading article of Nov. 20, you state that, in their survey of maternity, the Royal College of Obstetricians and Gynæcologists and the Population Investigation Committee found that ". . . about half of those originally booked for home delivery are finally admitted as unbooked cases to hospital . . . ." This is, of course, incorrect; the figure given on p. 60 of *Maternity in Great Britain* is 5%.

JAMES YOUNG
Chairman.

J. W. B. DOUGLAS
Director.

Joint Committee of R.C.O.G. and
Population Investigation Committee,
London School of Economics,
Houghton Street, W.C.2.

SIR,—It is indeed distressing to read in your leading article that only 5% of mothers confined in their own homes receive analgesia—this, fifteen years after Minnitt's introduction of his gas-air technique. Even worse, there are hospitals where women are left without any relief at all until just before the actual birth, and are then given the facepiece of the gas machine and told that they are having analgesia. They are not instructed in the technique of administration; machines are more often than not completely out of order; and not infrequently no-one even bothers to turn on the gas. Yet in the official reports of these same hospitals we read that all patients are offered analgesia in labour.

Throughout our land little is done to ensure success from gas-air analgesia. In how many hospitals in the metropolitan area is it the custom for a staff anæsthetist to make regular visits to the labour ward? To ensure satisfactory relief from pain, hospital apparatus must be examined at least twice a week by an experienced practitioner, and it is the plain duty of a staff anæsthetist to visit the labour ward for a short time during the actual administration of analgesia whenever the opportunity offers. Certainly this visit should be made once every 6–8 weeks. Gas-air analgesia, and 'Trilene' analgesia, will give very adequate relief from pain with attention to the details of administration; but the safety of these methods depends on small doses being given, and there is little margin for error.

Fifteen years' close experience of analgesia in labour has shown me how satisfactory the relief from pain can be; it is infinitely gratifying to an attendant at a confinement to see how much the patient appreciates the small trouble taken to ensure that all goes well.

New Barnet. J. E. ELAM.

HOSPITAL MANNERS

SIR,—I was pleased to see the timely article and editorial in your issue of Nov. 13, commenting on the unimaginative attitude maintained by some hospitals towards the patients. In the course of my work as personnel officer to a London company, I hear frequent complaints, of the type mentioned in your article, from members of the staff who are attending hospital. One girl, delighted to find that she was pregnant, was sent to her local hospital by her doctor. Her husband came to see me the day after the first visit and said that she had arrived home weeping and in a state of nervous exhaustion, and stated that six students had all been instructed by the doctor to examine her. Shortly after this, she had a miscarriage. Other women who have attended hospital for gynæcological complaints have also complained of being obliged to undergo examination by a succession of students. The majority of these women are sensible enough to realise that a thorough examination must be made if they are to be cured, and so long as they feel that the hospital procedure is directed primarily to this end they make no complaint; but when they are made to feel that they cease to matter as a person, and are just so much interesting material, it is not surprising that they experience a sense of outrage. I think their reactions would be different if their wishes were consulted before they were made the object of a lesson.

Another employee was required to attend a certain hospital for an examination. She had been in bed for several weeks and an ambulance was sent for her at 2 P.M., an appointment having been made for 2.30 P.M. She was left sitting in a draughty waiting-room until 8 P.M., during which time no-one paid the slightest attention to her or offered her so much as a hot drink.

Widmore Road, Bromley, Kent. J. M. MASTERS.

Parliament

Tsetse Fly in the African Colonies

IN the House of Commons on Nov. 22 Squadron-Leader ERNEST KINGHORN called attention to the campaign against the tsetse fly in the African colonies. The total area affected was $4^1/_2$ million square miles. In Sierra Leone and Gambia almost 100% of the territory was given over to the ravages of the fly. In Uganda the figure was slightly less than 80%, while in Tanganyika, so important for the groundnut scheme, 75% of the area was covered by its depredations. Under the Colonial Development and Welfare Act of 1945 large grants were made to combat the tsetse fly, and he would like to know what use had been made of this money, and whether the Portuguese, French, and Belgian governments were coöperating with us.

Mr. D. R. REES-WILLIAMS, under-secretary of State for the Colonies, said he believed that the tsetse fly was the African problem no. 1. The trouble was that there were so many species of the fly, some affecting cattle and others human beings. The problem was being tackled by the clearing and resettlement of certain areas, by the use of drugs, both as cures and as prophylactics, in both human beings and cattle. A drug called "7555" had had an extremely good effect and was now undergoing field-tests as a prophylactic. It was not certain whether this drug was the complete answer, but there were good possibilities it might be.

It was too early to form an opinion as to the effectiveness of spraying with insecticides, but two specially fitted aircraft were now in East Africa and a helicopter was on order. The results of the research experiments must be the deciding factor. The control of game had also been dealt with on a large scale in Southern Rhodesia and the results were being examined.

Since 1945 more than £1 million had been made available for research from the Colonial Development and Welfare Fund, and the Colonial governments had spent a great deal of money on this side of the work. The I.C.I. and Shell companies were also joining in the fight against the tsetse fly. International collaboration had been discussed at a conference at Brazzaville this year, and in London soon there was to be the first meeting of the international scientific committee which would coördinate and direct sleeping-sickness research in both Europe and Africa. Efforts were being made to induce veterinary surgeons to enter the Colonial Service by offering them better terms. Mr. Rees-Williams commended to the attention of the House the reports of Professor Buxton, Professor Davey, and Dr. Nash which contained detailed accounts of the work of scientists for many years past.[1]

Milk (Special Designations) Bill

Under this Bill (which was formally introduced in the House of Lords on Nov. 23), the Government propose to take steps to raise during the next five years the standard of all milk sold for liquid consumption to the highest standard of safety. The standard has been progressively raised until 70% of all milk now sold is regarded as safe, and of milk supplied to school-children 98%. But bovine tuberculosis still takes a heavy toll, and of the 1500 to 2000 deaths a year caused by it, most of the victims are children. Further statutory powers are necessary if improvement is to be made. The Minister of Food therefore is taking powers in the new Bill to enable him progressively to require all milk sold to conform to standards of safety. This will be done mainly by an extension of pasteurisation.

QUESTION TIME

Medical Man-power

Mr. A. C. BOSSOM asked the Minister of Health how many more doctors were required to enable the service promised under the new National Health scheme to be given satisfactorily; and what special efforts were being made to train doctors to supply this need.—Mr. ANEURIN BEVAN replied: Distribution is as important as total numbers. The Medical Practices Committee are obtaining reports from all areas in England and Wales as at Dec. 31 and will then be able to assess where the main under-doctored areas are. The medical schools are already filled to capacity. Mr. BOSSOM: Is it not a fact that there is a shortage in the neighbourhood of 20% of the doctors required and, in the circumstances, why is the Minister requiring people to pay for services which he is not able to give?—Mr. BEVAN: The hon. member is quite incorrect. Until the Medical Practices Committee has reported upon the matter, neither he nor I are in a position to say how far areas are under doctored. Mr. BOSSOM: Will the Minister urge the speeding up of this report, for the medical profession themselves say that approximately 20% are required?—Mr. BEVAN: I have no information at all that the medical profession does say that. It is a fact, however, that the doctors in particular localities are not anxious to say that their areas are under-doctored.

Mrs. LEAH MANNING: In view of the fact that this is an important and urgent question and that recruitment to the profession is likely to be very much increased in view of the security now afforded to young doctors, can the Minister have any consultations with the Chancellor of the Exchequer about widely expanding the medical schools at a very early date?—Mr. BEVAN: The medical schools are already filled to capacity and it is not possible to expand these schools beyond the capacity of teachers available to teach in them. It is not only the size of the medical schools, but the medical teaching staffs, which forms the limitation.

Colonel M. STODDART-SCOTT: Is the Minister, who has spoken of the fullness of medical schools, prepared to carry out the recommendation of the Goodenough Committee to start another medical school?—Mr. BEVAN: A large number of the recommendations of the Goodenough Committee are already in operation; but, as I have said, it is no use operating medical schools if we do not have the medical teaching staff for them.

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[1] See *Lancet*, Nov. 20, p. 819.

Basic Salary

Dr. S. SEGAL asked the Minister by what authority local executive councils were empowered to ask a doctor applying for payment of basic salary to submit details of his income from all sources; and if he would give an assurance that a doctor who refused to divulge these details would be in no way prejudiced when his claim for a basic salary came up for consideration.—Mr. BEVAN replied: My view is that it is only the doctor's professional income which should be taken into account in such cases. Dr. SEGAL: Would it not also be advisable to investigate incomes at the other end of the scale, where overworked doctors may have lists of patients they are unable to cope with and may be receiving now incomes larger than they ever had before?—Mr. BEVAN: I think that is another question entirely. That matter is being reviewed by the Medical Practices Committee, and not until we have had a survey of the whole country shall we be in a position to identify those parts where the lists are too large and the areas under-doctored.

Mr. JOHN RANKIN: Is the Minister aware that doctors who apply for the basic salary are being told that that basic salary, if paid, is a charge upon their colleagues in the area which they practise, and does he think that that policy lends itself to a fair interpretation of decision by those colleagues?—Mr. BEVAN: It is a fact that the £300 per year comes out of the general capitation pool—as indeed ought to—because it forms part of a doctor's remuneration. Where, however, the individual doctor is aggrieved he has the right to appeal to me. Many have appealed and decisions have been given.

Sale of Dangerous Drugs

Mr. BARNETT JANNER asked the Home Secretary to what extent the sale of dangerous drugs is increasing in the West End of London; if he would give the reason for the increase; and what action he was proposing to take to deal with this danger.—Mr. CHUTER EDE replied: I am satisfied that there is no organised illicit traffic in drugs to which the Dangerous Drugs Acts apply, either in the West End of London or elsewhere in this country, and that in most of the individual cases of unlawful use of these drugs the offender is brought to justice. My department, in coöperation with the police and H.M. Customs, will continue to exercise the utmost vigilance in order to secure the enforcement of the law relating to dangerous drugs. I am satisfied that, as a result of the measures taken, addiction to dangerous drugs is not a serious problem in this country. Mr. JANNER: May I ask the Minister if he can say whether in the recent case where sufficient drug to kill something like 5000 persons was stolen, any progress has been made in the recovery of that drug?—Mr. EDE: We are doing what we can to get it back, but it does not appear that it has yet been taken by any very large proportion of the 5000 people.

Mr. JOHN LEWIS: Is the Minister satisfied that in the remarkable number of instances recently where publicity has been given to the loss of drugs from doctors' cars, in every case they are genuine?—Mr. EDE: A doctor reports the loss; whether the drugs or the loss are genuine, I am afraid I do not know.

Hearing-aids

Sir WALDRON SMITHERS asked the Minister of Health whether a patient who had purchased a hearing-aid instrument was disqualified from receiving a free one at a later date.

Mr. BEVAN replied: No, Sir.

In answer to a further question Mr. Bevan stated that over 3000 Medresco hearing-aids had already been supplied to patients. He was advised that this aid gave a performance at least as good as that of any commercial aid.

Equal Pay

Mr. D. McA. ECCLES asked the Minister why there were differences in the scales of pay between men and women administrative officers in the *National Health Service*.—Mr. BEVAN replied: The differences are being abolished.

Trial Use of B.C.G.

Mr. W. N. WARBEY asked the Minister of Health what arrangements were being made for a trial use of B.C.G. vaccine in this country, with a view to better protection of nurses, doctors, and other contacts particularly exposed to the risks of tubercular infection.—Mr. BEVAN replied: Arrangements are nearing completion, but I am not yet in a position to make any useful public statement on them. I will do so as soon as possible.

Sickness Benefit

Mr. A. H. E. MOLSON asked the Minister of National Insurance on what date contributors since July 5, 1948, to the National Insurance scheme would become eligible for sickness benefit.—Mr. JAMES GRIFFITHS replied: Dec. 28, 1948, is the earliest date on which employed or self-employed persons who were new entrants to National Insurance on July 5 could qualify for sickness benefit.

National Health Service in Scotland

Replying to questions, Mr. ARTHUR WOODBURN *stated that some 2400 doctors and some 1200 dentists were in general practice in Scotland. Of these, 2364 doctors and 1124 dentists had joined the service. Approximately 94% of the population had joined.*

Radiography Units in Scotland

Mr. WILLIAM ROSS asked the Minister how many mass-radiography units were in operation in Scotland; and where they were.—Mr. WOODBURN replied: Four mass-radiography units are at present in operation in Scotland, two in Glasgow, one in Edinburgh, and one in Motherwell.

Obituary

JAMES HARRY SEQUEIRA

M.D. LOND., F.R.C.P., F.R.C.S.

Dr. Sequeira, who has died in Kenya at the age of 83, was a leading dermatologist, who attracted to his clinic colleagues from all over the world. He was associated with the introduction of the Finsen lamp into this country, and he pioneered the therapeutic use of X rays and radium.

A doctor's son, he was born in London in 1865 and received his early education at King's College School. In 1884 he won a science scholarship to the London Hospital, and in due course he graduated with honours in medicine and obstetrics. His first ambition was to be a surgeon, and he became F.R.C.S. in 1893; but a surgical vacancy on the staff fell to Sir Frederick Treves, and Sequeira embarked on dermatology via medicine. As a young man he was influenced by Sir Stephen Mackenzie, whose house-physician he was. Dermatology was then emerging as a specialty in its own right. Mackenzie used to treat patients with skin disease in his general wards, but on his retirement a separate department was set up and Sequeira was appointed to take charge of it. In those early days the department's patients were scattered round the hospital, each physician having surrendered one bed, but ultimately separate wards were opened.

British Journal of Dermatology

At the turn of the century Sequeira studied for a time under Niels Finsen in Copenhagen. Always quick to take up new ideas, he returned to London convinced of the value of Finsen's work on actinotherapy. In 1900 the first Finsen lamp, a gift from Queen Alexandra, was installed in the London Hospital, and in the following year Finsen's *Phototherapy*, translated by Sequeira, was published in English. His cosmetic results with this treatment have never been bettered.

He had also visited Vienna, where Freund and Schiff were investigating the therapeutic possibilities of X rays. These trials were followed by the introduction of radium in treatment. Here again Sequeira led the way. Before surgeons in this country grasped the potentialities of radiotherapy he had devised holders for radium plates which enabled him to treat malignant disease of the mouth and throat; and under his hand the technique developed so rapidly that in 1905 he was asked to read a paper at the International Congress of Surgery, in Stockholm, on the Use of Radium in the Treatment of

Malignant Disease. Many years later he recalled, in the *British Journal of Dermatology* (which he edited from 1911 to 1915), how he had had to "work on a system of trial and error, which unfortunately had disastrous effects on some of the workers." These troubles led him to devise and install protective cubicles—perhaps the earliest contribution to the safety of X-ray workers. But he himself was a life-long sufferer from the effects of irradiation.

He and his assistants developed to a fine art the X-ray epilation for ringworm; at one time five X-ray tubes were at work for $5\tfrac{1}{2}$ days a week on children with tinea capitis—now a comparative rarity. He was also early in the field as a clinical photographer.

One of the first to point out the importance of dermatology in medical training (and an advocate of its inclusion early in the curriculum), he used to hold every Thursday morning a teaching clinic at which systematic lectures were given. His textbook, which was first published in 1911 and reached its fifth edition last year, proved very popular. It was not as large or as comprehensive as others—for example that of his contemporary, J. M. H. MacLeod—but it was very readable and contained a wealth of personal observation and clinical experience, and was particularly valued for its sections on treatment.

Sequeira served as president of the section of dermatology of the Royal Society of Medicine (1925–27), and councillor of the Royal College of Physicians (1927). Always interested in the social aspects of syphilis, he was at one time chairman of the executive committee of the Society for the Prevention of Venereal Disease; and he was a member of the Trevethin Committee on venereal disease. In fact the establishment of venereal-disease centres probably owes less to political enlightenment or pressure than to a visit paid to his centre by members of the Local Government Board, including Sir Arthur Newsholme, then chief medical officer, who saw a demonstration of children cured of congenital syphilis.

In 1927 Sequeira retired to Kenya, but not to withdraw from active affairs. He added to his interest in dermatology by studying leprosy; and his acute observation of conditions in Kenya was reflected in his Chadwick lecture in 1932 when he criticised some aspects of the unification of the Colonial Services. "It seems a pity," he then said, "that men should be suddenly removed from the mid-Pacific, with its own problems, to East Africa where the conditions are so different." For a time he was chairman of the Kenya branch of the B.M.A., and until lately he edited the *East African Medical Journal.*

"Throughout his life," writes W. J. O'D., "he had a pioneering spirit, testing and using or rejecting any new weapon offered to the practising physician. He wrote classical papers on lupus, on light therapy, and on the rare association of blood and skin changes. In his year of office as president of the dermatological section of the Royal Society of Medicine he presided with urbane distinction. He had a short square figure, a leonine head early covered with thick white hair, wide blue eyes, great dignity, and the greatest kindness.

"Few dermatologists have had the preliminary training in the whole art of medicine that Dr. Sequeira underwent, and throughout his practice of dermatology he approached his cases with the judgment of a physician and the sure touch of a surgeon. He was a great figure for a quarter of a century at the London Hospital, and is remembered in many homes. His kindness to doctors and to their wives was untiring, and his encouragement to young doctors was never failing."

"Sequeira's eminence," adds R. T. B., "was due above all to his clinical instinct and his sympathetic nature. It was characteristic of him, in his wish to help younger men, that he should have asked two of his former house-physicians and first assistants to collaborate with him in preparing the fifth edition of his famous book. His memory will be revered by hundreds of Londoners, who will always remember his dynamic but diminutive person, rather reminiscent of Mr. Punch, with a grand sense of humour, and a twinkle in his eye as he recounted some amusing anecdote about doctors or patients and dermatological adventures."

Dr. Sequeira is survived by his wife and by two adopted children.

LOUISA HAMILTON

M.D. LOND.

Dr. Louisa Hamilton, who died at her home in Buckinghamshire on Nov. 24, was one of the outstanding medical women of her generation. The grand-daughter of Sir William Hamilton, the philosopher, she was born in Edinburgh, where she received her early education. Coming to London she entered the London School of Medicine for Women, and in 1900 qualified as M.B. from the Royal Free Hospital, with honours in medicine and obstetrics. Six years later she took her M.D.

After a few months as assistant to a general practitioner in Essex, she returned to London to take up resident appointments at the New Hospital for Women (now the Elizabeth Garrett Anderson Hospital). In 1901 the resident medical posts at the Royal Free Hospital were opened to women, and in the following year Dr. Hamilton was appointed house-physician there. The holders of these early posts were critically watched and tact was called for as well as professional competence. Dr. Hamilton was a first-rate pioneer. Her sound knowledge, her common sense, her genial personality and her sense of humour stood her in good stead, winning not only the warm appreciation of her chiefs and fellow residents but the confidence and respect of the nursing staff, some of whom were watching the new departure with a somewhat doubtful eye.

After this she acted for several years as demonstrator of anatomy at the school, and as pathologist at the Elizabeth Garrett Anderson Hospital; and from 190 to 1912 she was in general practice in Brunswick Square. Her interest was, however, mainly in medicine, and in 1912 she moved to Nottingham Place in order to specialise. She was appointed to the honorary staff of the Elizabeth Garrett Anderson Hospital, eventually retiring from the post of senior physician in 1936.

For some years she was medical officer to the North London Collegiate School for Girls, to the Church of England Zenana Missionary Society, and later to the Methodist Missionary Society. These activities greatly interested her; and her good judgment, wisdom, and other personal qualities were much valued. Outside her professional work her great interest lay in her country cottage at Loosley Row in Buckinghamshire where she planned and made a really beautiful garden and delighted to entertain her friends. She was also a highly skilled needlewoman and an excellent cook.

J. H. T.

Dr. Hamilton had a very able grasp of medicine and particularly of skin diseases. Herself possessing courage, energy, and great integrity, she sought and encouraged these qualities in her students and house-physicians and her loyalty to, and protection of, her staff was a firm foundation to an efficient unit. She had a great love for young people, with an unsentimental understanding of their problems which made it possible for young men and women to ask for her advice. This was invariably kind, shrewd, and practical.

K. I.

GEORGE JAMES IRVINE LINKLATER

O.B.E., M.D. EDIN.

Dr. G. J. I. Linklater, chief executive school medical officer to the Edinburgh corporation, died in the City Hospital, Edinburgh, on Nov. 23. He had been in the service of the corporation for 26 years.

Dr. Linklater graduated in medicine at Edinburgh University in 1912. After holding resident posts in Edinburgh at the City Fever Hospital and at the Royal Victoria Hospital he became tuberculosis officer for the city, and with Dr. John Guy, a former medical officer of health, he wrote the well-known textbook *Hygiene for Nurses.* In 1920 he took his M.D. and two years later the M.R.C.P.E. He also held diplomas in public health and in tropical medicine and hygiene.

A keen Territorial, Dr. Linklater served with the Royal Army Medical Corps in both wars, and he received the O.B.E. for his services in the first. During the late war he held the rank of colonel, and for his services to the Red Cross he was awarded the Order of St. John. For many years he had also been a High Constable of Holyroodhouse.

W. G. C. writes: "Dr. Linklater was one of the city's ablest administrators, and the high standard of the school medical service is due to his unceasing work. He was at his best with children, as those who have seen him hold the rapt attention of large audiences at the junior cinema clubs on Saturday mornings will know. An able and lucid lecturer, he also took a leading part teaching hygiene to nurses and health visitors. His many friends will miss a delightful raconteur and a good companion."

NANCY GWENDOLYN SHUBIK

M.R.C.S., D.P.H.

Dr. Nancy Shubik, who died on Sept. 20, was the daughter of Mr. and Mrs. F. S. Rogers of Newport, Monmouthshire. She entered the Welsh National School of Medicine in 1935 and qualified in 1939, taking the D.P.H. in 1941. After two years in clinical and public-health work she became demonstrator in pathology at Cardiff. In 1944 she was appointed junior lecturer in pathology at the British Postgraduate Medical School at Hammersmith, where she also undertook research into silicosis under Prof. E. J. King. Throughout her career she was a most enthusiastic worker, with a great determination to seek the exact answers to the problems that she met in her work. In the following year she joined the Indian Medical Service. She did excellent work in India, and as one observer said, "continued dealing with the sick and wounded when others had decided they had done enough work for the day." On returning to England in 1947 she took up neuropathological research in Sir Hugh Cairns's department at Oxford.

Births, Marriages, and Deaths

BIRTHS

G-SCOTT.—On Nov. 19, the wife of Dr. T. M. Bocg-Scott—a son.

ARLES.—On Nov. 26, in London, the wife of Dr. J. A. Charles—a daughter.

E.—On Nov. 20, in London, the wife of Dr. J. W. Ker—a daughter.

SON.—On Nov. 20, the wife of Dr. H. M. Lawson—a son.

YON-WHITE.—On Nov. 20, at Cambridge, the wife of Dr. Richard Mayon-White—a son.

KLEY.—On Nov. 19, in London, to Dr. Margaret Dudley-Brown, wife of Lieutenant (S) G. E. Oakley, R.N.—a daughter.

PEYTON.—On Nov. 23, at Ipswich, the wife of Dr. H. N. Peyton—a son.

SHOOTER.—On Nov. 22, in London, the wife of Dr. R. A. Shooter—a son.

VICKERS.—In November, at Singapore, the wife of Dr. W. J. Vickers—a son.

MARRIAGES

ANDERSON—HESKETH.—On Nov. 20, at Digswell, Thomas Barclay Anderson, M.R.C.S., to Margaret Hesketh.

CONNOLLY—CULLIS.—On Nov. 20, in London, R. Campbell Connolly, F.R.C.S., to Elizabeth Fowler Cullis.

PEATFIELD—WILSON HALL.—On Nov. 20, at Eastbourne, Ronald Peatfield, F.R.C.S., to Ruth Beryl Wilson Hall.

WEBB—WOOD.—On Nov. 25, at Swindon, Eric R. Webb, M.R.C.S., to Mary Wood.

DEATHS

BONAVIA.—On Nov. 20, at Hamburg, Victor Joseph Bonavia, M.D. Malta, M.R.C.P., lieut.-colonel, R.A.M.C., aged 54.

HAMILTON.—On Nov. 12, in New York, George Johnson Hamilton, M.D. New York, M.R.C.S.

HAMILTON.—On Nov. 24, at Loosley Row, Princes Risborough, Louisa Hamilton, M.D. Lond.

KITCHIN.—On Nov. 22, Percy Kitchin, M.R.C.S., aged 78.

LILLEY.—On Nov. 22, Ernest Lewis Lilley, M.B. Lond., F.R.C.S., aged 72.

MAPLES.—On Nov. 16, in Jersey, Ernest Edgar Maples, M.D. Lond., F.R.C.S.

MOSELEY.—On Nov. 21, at Ipswich, Charles Kingdon Moseley, M.R.C.S., aged 84.

PALMER.—On Nov. 22, at Prestbury, Cheltenham, Harold Thornbury Palmer, M.R.C.S.

RAWLINGS.—On Nov. 23, at Cambridge, Grahame Rigby Rawlings, M.B. Camb., D.A.

SEQUEIRA.—In November, in Kenya, James Harry Sequeira, M.D. Lond., F.R.C.P., F.R.C.S., aged 83.

STUART.—On Nov. 26, at Harpenden, Emily Gertrude Stuart, M.B. Lond., aged 76.

Notes and News

PRACTITIONERS' LISTS

THE Minister of Health last week withdrew his general consent to practitioners having on their lists more than the prescribed maximum number of patients. Executive councils have been requested to review as soon as possible the numbers on the lists of doctors in their area; and they are urged to collect by Feb. 1 accurate figures as at Jan. 1. It is suggested that as a preliminary step a doctor with an excess list should be asked not to take further patients on to his list (except relatives of persons already on his list living in the same house) unless the list can be brought within the appropriate limit by taking in a partner or employing an assistant. Councils may still apply in individual cases for the Minister's consent to an increased maximum.

PRODUCTIVE WORK FOR THE HOSPITAL PATIENT

IN the past a number of hospitals have arranged for their long-stay patients to do productive work sent in by neighbouring firms; but to avoid liability for insurance contributions, and disturbance of National Insurance benefits, no *direct payment has been made to patients.* The Ministry of National Insurance has now provided under the National Insurance (Unemployment and Sickness Benefit) Regulations, 1948, that payment for such work may be made direct to patients without affecting the right to sickness benefit provided that: (1) the earnings do not exceed £1 a week; and (2) the work is undertaken under medical supervision as part of the hospital treatment. If the amount earned exceeds £1 a week, benefit will cease and insurance contributions will ordinarily be payable. (This provision does not alter the arrangements already announced for National Insurance benefits to be reduced or suspended where a patient is undergoing inpatient treatment in a National Health Service hospital; here the reduced benefits will not be further reduced unless the earnings exceed £1, when they will cease.) A patient will not be required to pay National Insurance contributions unless his earnings exceed £1 a week, when a class-1 contribution will be required from patient and employer if the employment is under a contract of service. If there is no contract and the earnings are over £1 a week, class-2 contributions will be payable by the patient, but exception can be claimed if the total income from all sources does not exceed £2 a week. Hospital authorities are urged by the Ministry of Health to introduce arrangements for the employment of suitable long-stay patients; and they are advised to apply in the first place to the disablement resettlement officer at the local office of the Ministry of Labour and National Insurance. The hospital authority will decide the method of paying a patient for his work. Outpatients in receipt of sickness benefit may also receive payment for work.

AUSTRALASIAN PRIMARY FELLOWSHIP

THE primary fellowship examination of the Royal Australasian College of Surgeons is to be reciprocal with that of the Royal College of Surgeons of England.[1] A primary examination for the English fellowship is to be held in Australia next February. Thereafter those succeeding in the Australasian college's primary (for which courses will be held) will be able to proceed to the English final examination.

SWISS HOSPITALITY

THE people of Switzerland have shown their appreciation of the British war effort in many ways, and in 1946 the Don Suisse offered to provide, for one year, 100 beds in sanatoria at Leysin, in Switzerland, for the free accommodation and treatment of British ex-Servicemen with pulmonary tuberculosis. The patients were selected by the Ministry of Pensions according to clinical criteria agreed with the Swiss doctors, and the first hundred patients went to Switzerland at the beginning of 1947. In August 76 patients returned after the agreed period of treatment and 79 others went out. The remainder came back in small groups from time to time. The scheme was extended by eight months through the generosity of Don Suisse, and finally ended last August. The patients settled down well, and all spoke highly of the medical care they received and with great appreciation of the friendly welcome and kindness shown to them in Switzerland.

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[1] *Med. J. Aust.* Nov. 20, p. 620.

The Ministry of Pensions thinks it too early to assess the lasting effects of this treatment, but the future progress of the patients is to be specially noted.

WHOLE FOOD

At the inaugural meeting of the Producer Consumer Whole Food Society in London on Oct. 27, Mr. F. N. Turner, the chairman, said that the society exists to encourage the production and distribution of whole food. It was announced that a panel of over sixty producers growing and supplying whole foods had been built up. The society has already taken up with the Ministry of Food the question of subsidies on cereals, on the score that subsidised products are invariably denatured, those who use unprocessed cereals having to pay a much higher price. The society, which includes farmers, is opposed to the use of chemicals for fertilising soil.

University of Oxford

On Nov. 20 the degree of D.M. was conferred on J. E. Duffield.

University of Edinburgh

Sir Edward Appleton, F.R.S., secretary of the Department of Scientific and Industrial Research and Nobel laureate, has been appointed principal and vice-chancellor in succession to the late Sir John Fraser.

Scottish Conjoint Board

The following candidates, having passed the final examinations, have been admitted to the licentiateship of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow:

D. S. Anderson, R. A. Atherton, G. J. Bagley, P. M. Brazil, Philip Freeman J. H. Gentles, Harry Gerber, L. H. Geronimus, Susan M. Gillies, T. E. Grant, J. C. O. Iwenofu, Josef Jochnowitz, Alexander Logan, L. C. Luck, K. E. M. Melville, Martin Metz. A. W. P. Millard, A. J. Mone, William McIlwraith, Monica B. Macnamara, Eleanor D. M. Pierce, David Pride, F. R. Reid, Ellen M. Rosenthal, David Simon, P. H. Slade, R. A. Spalding, Helen L. Steven, David Stewart, J. A. Turner, Robert Wilson, James Winning, J. S. Wood, M. J. Zimmerman.

British Psychological Society

The medical section of the society is holding a meeting at 8 P.M., on Wednesday, Dec. 8, at 1, Wimpole Street, London, W.1, when Dr. Elizabeth Rosenberg, Sir Paul Mallinson, and Dr. O. W. S. FitzGerald will speak on the *changing Functions of a Psychiatric Outpatient Department.* Psychiatrists are invited to attend the meeting.

British Medical Association

The council of the association are shortly offering the following prize and scholarships:

Nathaniel Bishop Harman prize (£100) is offered to promote systematic observation and research among consultant members of the staffs of hospitals who are not attached to recognised medical schools. It will be awarded for the best essay on work which must include observations collected by the candidate in the course of his practice.

Ernest Hart scholarship (£200), *Walter Dixon scholarship* (£200), *and four research scholarships* (£150 each) are offered for research in any subject, including State medicine, relating to the causation and prevention or treatment of disease.

Insole scholarship (£250) is offered for research into the causes and cure of venereal disease.

Further particulars may be had from the secretary of the association, B.M.A. House, Tavistock Square, London, W.C.1.

Supply of Vaccines and Sera

As already announced, stocks of vaccine lymph and diphtheria prophylactic are being held at laboratories of the Public Health Laboratory Service for issue, free of charge, to medical officers of health or to practitioners taking part in local health authorities' arrangements under section 26 of the National Health Service Act. Certain other substances not readily obtainable at present from trade sources will also be available through the laboratory service. These materials include measles serum, typhus vaccine, rabies vaccine, botulinum antitoxin, anthrax serum, and snake-venom serum.

The protein-free extracts of stomach and small intestine, with which O. Hubacher reported favourable results in gastric and duodenal ulcer (*Lancet*, 1946, ii, 274) can now be obtained from Messrs. Ward, Blenkinsop and Co., under the name of 'Robaden.'

Diary of the Week

DEC. 5 TO 11

Monday, 6th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. W. E. Lloyd: Pleurisy and Pleural Effusions. (Part II.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Prof. J. M. Yoffey: Nuclei of the Brain Stem.
5 P.M. Dr. W. S. Feldberg, F.R.S.: Autonomic Nervous System.

Tuesday, 7th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. F. Goldby: Vagus Nerve and its Distribution.
5 P.M. Dr. Feldberg: Chemical Transmission of Nerve Effects.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3 P.M. Sir Lionel Whitby: Physiology of Hæmopoiesis. (First Harben lecture.)

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. W. J. O'Donovan: Hysteria Cutis.

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Dr. J. W. B. Douglas: Maternity in Britain.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE
5 P.M. (Royal Infirmary.) Prof. O. L. Richmond: A Scholar's View of Immortality.

Wednesday, 8th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Sir John Parkinson: Heart-failure.

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. S. Zuckermann: Female Reproductive Tract.
5 P.M. Mr. George Brownlee, PH.D.: Chemotherapeutic Drugs.

UNIVERSITY COLLEGE, Gower Street, W.C.1.
5.15 P.M. Dr. J. W. Trevan, F.R.S.: Statistics from the Standpoint of a Pharmacologist. (Second of two lectures.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
3 P.M. Sir Lionel Whitby: Dyshæmopoiesis from Nutritional and Specific Deficiencies. (Second Harben lecture.)

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vincent Street, Glasgow.
5 P.M. Prof. J. C. Spence: Poliomyelitis.

Thursday, 9th

ROYAL COLLEGE OF SURGEONS
5 P.M. Sir Reginald Watson-Jones: Reactions of Bone to Metal. (Robert Jones lecture.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
3 P.M. Sir Lionel Whitby: Dyshæmopoiesis from Noxious Agents. (Last Harben lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1
7.30 P.M. Prof. G. P. Crowden: Physiological Studies of Mental and Physical Work in Hot and Humid Environments.

INSTITUTE OF DERMATOLOGY
5 P.M. Dr. J. L. Franklin: Seborrhœic Dermatoses.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
4.15 P.M. Mr. G. Ewart Martin: Acute Otitis Media.

Friday, 10th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Prof. L. J. Witts: Aplastic Anæmia and Agranulocytosis.

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. Brownlee: Chemotherapeutic Drugs.

MAIDA VALE HOSPITAL MEDICAL SCHOOL, W.9
5 P.M. Mr. Valentine Logue: Case demonstration.

LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. J. Smart: Mediastinal Tumours.

Appointments

CARTER-LOCKE, H. B. C., M.B. Lond., D.P.H.: deputy M.O.H., Bromley, Chislehurst, Sidcup, and Orpington, Kent.

FREEMAN, PERCIVAL, M.B. Leeds, D.P.H.: deputy M.O.H. and asst county M.O., Kent.

KAHN, J. H., M.B. Leeds: psychiatrist, child-guidance clinic, Huddersfield.

PRITCHARD, P. M. M., M.A., M.B. Camb., D.C.H.: registrar, pædiatric department, University College Hospital, London.

TUCK, IVY, M.B. Lond.: morbid anatomist and hæmatologist, North Middlesex Hospital.

Colonial Service:

AUSTIN, F. C. K., M.D. Edin., D.T.M. & H.: district M.O., Windward Islands.
BROWNE, R. E., M.R.C.S.: supernumerary M.O., Leeward Islands.
CONACHER, D. G., M.B. Edin.: M.O., Tanganyika.
EDDEY, L. G., M.B. Aberd., D.T.M. & H.: director of medical services, British Guiana.
FAIRLEY, DOUGLAS, M.D. Glasg.: senior medical officer, St. Helena.
FOWLER, A. F., M.R.C.S., D.T.M. & H.: M.O., Tanganyika.
HEARD, R. G. P., B.A., M.B. Dubl.: M.O., Tanganyika.
YAP, P. M., M.A., M.B. Camb.: M.O., Hong Kong.
ZWIERZ, MACIEJ, M.D. Beyrouth: M.O., St. Vincent, Windward Islands.

THE PATHOGENESIS OF THE ACUTE EXANTHEMS

AN INTERPRETATION BASED ON EXPERIMENTAL INVESTIGATIONS WITH MOUSEPOX (INFECTIOUS ECTROMELIA OF MICE)

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From the Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia

ONE of the most intriguing problems of human virus infections is the pathogenesis of the acute exanthems—smallpox, chickenpox, measles, and rubella—which are characterised by a long incubation period and by a rash which develops some days after the onset of symptoms. Experimental investigation of these diseases is hampered by the lack of suitable susceptible laboratory animals. In the absence of direct studies it seems reasonable to investigate the pathogenesis of such natural virus diseases of laboratory animals as are characterised by these features, and to compare the results thus obtained with the data available on the pathogenesis of the human exanthems.

The recent identification of the virus of infectious ectromelia of mice as the murine representative of the mammalian pox viruses (Burnet and Boake 1946) and subsequent studies on the clinical and pathological features of the disease and its epizootic behaviour (Fenner 1948a) suggested that this disease, mousepox, could be used as such a "model." Cross-protection tests (Fenner 1947a) have given ample evidence of the close relationship of the virus to vaccinia virus. Recent tests of the inhibition of hæmagglutination due to vaccinia and ectromelia viruses by sera from non-vaccinated humans who had just recovered from smallpox † have shown that variola virus also is closely related to ectromelia virus.

Mousepox is spread by contact, the virus usually entering the host's body through minute abrasions of the skin (Fenner 1947b). Seven or eight days after the mouse has been exposed to infection a primary lesion develops at the site of entry of the virus, and this is followed within the next two days either by death, with acute necrosis of the liver and spleen, or by a rash which reaches its apogee in another two or three days. Thus mousepox is caused by a virus closely related to the causal organism of one of the human acute exanthems and is characterised by a relatively long incubation period and a rash.

The pathogenesis of mousepox was studied by inoculating a large number of mice in the pad of the hind foot with a small dose of ectromelia virus, a procedure which closely resembles natural infection. At daily intervals between the second and the twenty-fourth day two mice were killed. The virus and ectromelia anti-hæmagglutinin (E.-A.H.A.) content of the blood, and the virus content of the inoculated foot, the skin of the abdomen remote from the site of inoculation, and the spleen of each mouse was determined. Sections of skin were also studied, Mann's stain being used to demonstrate virus inclusion bodies. The technical methods used and the detailed results obtained are fully described elsewhere (Fenner 1948b). Here a hypothesis of the pathogenesis of mousepox based on these experiments is presented and the pathogenesis of the human acute exanthems is discussed in the light of this hypothesis.

MULTIPLICATION OF VIRUS AFTER A STANDARD SMALL INFECTING DOSE

In fig. 1 the results of the series of virus and antibody titrations are shown in the form of curves constructed through the individual daily titres, which have been omitted here but are being published elsewhere (Fenner 1948b). The ordinates are logarithmic, one unit indicating a tenfold difference in virus concentration. The appearance of the foot and of the shaved skin, and the density of inclusion bodies in sections of the skin, are also shown.

In the Foot

When the foot was the site of the primary lesion, the virus multiplied there logarithmically between the first and the eighth day and more slowly afterwards, the titre remaining about the same from the ninth to the fourteenth day. After that the titre fell steadily until no virus was detected after the thirtieth day. The fall was unrelated to the masking of virus by antibody.

No macroscopic change was observed in the inoculated foot until the seventh day, when it was slightly swollen in most of the mice. This point, the first clinical evidence of infection, has been taken as the end of the incubation period. The concentration of virus in the foot had reached almost its maximum before there was clinical evidence of infection.

In the Spleen and Blood

The first evidence of blood-stream dissemination of the virus was the demonstration of virus in the spleen on the fourth day. The titre of virus in the spleen then rose steeply. In some animals, which were either moribund when killed or destined for an early death from acute mousepox, the titre rose to a very high level—over 10,000,000,000 infective particles per g. In the other animals a stationary phase was reached at a level of 100,000,000 infective particles per g. on the seventh day, and this continued until the tenth day. Thereafter, coinciding with the rapid increase in circulating antibody, the concentration of virus in the spleen declined rapidly, and none was recovered after the sixteenth day, except in one animal in which the virus titre was higher than usual in the foot and skin and virus was also present in the spleen and blood. The E.-A.H.A. titre was 1000, and in the undiluted blood antibody inactivated the virus present. However, this effect was overcome by dilution of the blood.

Large amounts of virus in the blood were found only in moribund animals. In the others virus was always present in the blood at a relatively low titre between the fifth and the twelfth day. Viræmia in mousepox is probably due to the continual liberation of virus into the blood-stream by necrosis of the infected cells of the spleen and liver and possibly the bone-marrow also.

In the Skin Remote from the Point of Inoculation

The curve (fig. 1) showing the virus content of the skin and its relation to the lesions of the rash and the occurrence of inclusion bodies in the epidermal cells is of considerable interest. Virus was first found in the skin on the sixth day and increased logarithmically until the eighth or ninth day, when the concentration reached a stationary phase which persisted until the fourteenth day. Thereafter it fell rapidly. As in the primary lesion, macroscopic changes were first detected when the virus titre had almost reached its maximum. This is in keeping with observations on other virus diseases (Rivers 1939, Bang 1943, Taylor 1941).

Histological examination of the skin showed that the first change, which was seen on the seventh day, occurred in isolated groups of the basal cells of the epidermis, which showed pyknotic nuclei surrounded by vacuoles. A few inclusion bodies were evident in the cytoplasm of some of these cells. The size and number of affected area of skin rapidly increased until on the ninth day there were many papules in which most of the epidermal cells were infected, and inclusion bodies were numerous in the cells of the hair follicles and sweat glands also. Massive necrosis of the superficial cells of the papules converted them to ulcers with closely adherent scabs. The dermis showed intense lymphocytic infiltration at this stage. Healing took place by the development of new epithelium beneath the scabs, and the new epidermal cells were not invaded by the virus. The scabs had fallen off by the eighteenth day, and after a further week recovery was complete except for the absence of hairs and sweat glands in the scarred areas of skin.

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* Present address: Rockefeller Institute for Medical Research, New York.

† These sera were kindly supplied by Dr. F. O. MacCallum.

TIME OF APPEARANCE OF VIRUS IN REGIONAL LYMPH-NODES, BLOOD, LIVER, AND SPLEEN

Certain features of the pathogenesis of mousepox were not established in the experiments just described; so another short experiment was carried out in which mice were infected by rubbing the pinna with a swab soaked in a concentrated virus suspension, and testing the blood and suspensions of the regional lymph-node, the pinna, the liver, and the spleen for the presence of virus. Accurate titrations were not performed, but the methods used were sensitive enough to detect very small concentrations of virus. The results are shown in table I.

Virus was isolated from the regional lymph-nodes eight hours after the application of the virus suspension to the ear, and increased in titre for the next few days. On the third day a small amount of virus was found in the blood, and larger amounts in the liver and spleen. The virus content of the liver and spleen then increased rapidly, and that of the blood increased slightly.

RÔLE OF ALLERGY IN PRODUCTION OF SKIN LESIONS

Most hypotheses of the pathogenesis of the rashes of the acute exanthems have, from the time of von Pirquet (1913), postulated allergy as the basic mechanism by which the rash is produced. However, in the experiments just described, focal multiplication of virus in the skin was shown to cause the rash. An allergic reaction to ectromelia virus could not be demonstrated in these animals until the seventh day after infection—i.e., after the virus had become localised in the skin.

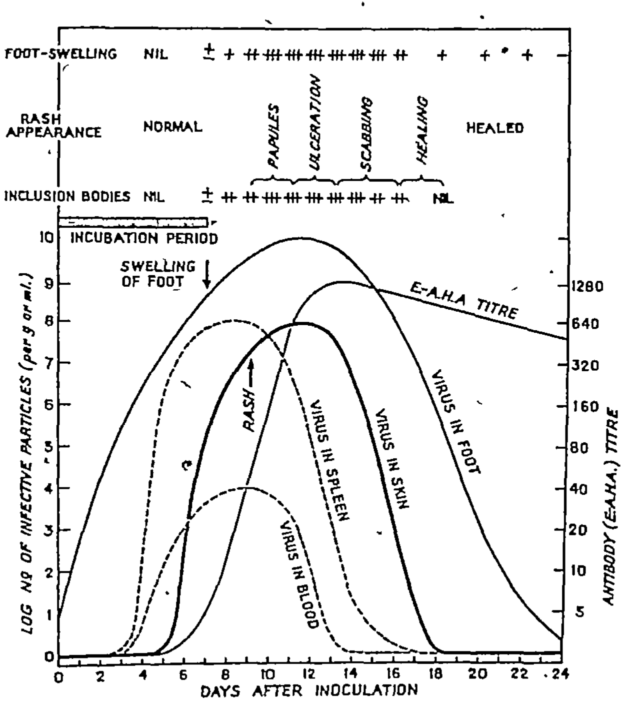

Fig. 1—Growth curves of virus in foot, spleen, blood, and skin of mice inoculated in the foot with a small dose of "Moscow" ectromelia virus. Development and disappearance of primary lesion and rash are shown, as is the occurrence of inclusion bodies in skin in sections stained with Mann's stain.

The strongest evidence that allergy is of little importance in causing the rashes of the acute exanthems is derived from the study of cases of congenital variola and vaccinia (Lynch 1932), alastrim (Stott 1945), measles (Kohn 1933), and chickenpox (Shuman 1939). In all these diseases the rash appears to go through its normal course of development in fœtuses infected in utero. The fœtus is probably incapable of forming antibody (Grasset 1929, Burnet 1941); and, though the human placenta is permeable to neutralising antibodies, which probably play a part in controlling the fœta infection, it is impermeable to sensitising antibodie (Sherman et al. 1940). The production of typical ski pocks three or four days after the inoculation of large dose of vaccinia virus into the bodies of 24-day-old rabbi fœtuses (Gallagher and Woolpert 1940), and of ski lesions and Koplik's spots in simian measles four day after the intravenous inoculation of virus (Blake an Trask 1921), is explicable only on the hypothesis that th skin lesions are caused by multiplication of the virus.

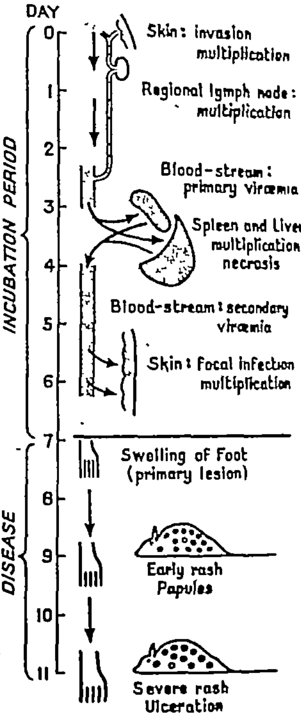
DAY
0
1
2
3
4
5
6
7
8
9
10
11
INCUBATION PERIOD
DISEASE
Skin: invasion multiplication
Regional lymph node: multiplication
Blood-stream: primary viræmia
Spleen and liver: multiplication necrosis
Blood-stream: secondary viræmia
Skin: focal infection multiplication
Swelling of Foot (primary lesion)
Early rash Papules
Severe rash Ulceration

Fig. 2—Diagrammatic representation of pathogenesis of mousepox.

PATHOGENESIS OF MOUSEPOX

The observations just described may be interpreted as shown diagrammatically in fig. 2. Infection with ectromelia virus takes place by the introduction of a few virus particles into the skin of the mouse either naturally through an abrasion or by inoculation. Within eight hours of the establishment of infection virus passes to th regional lymph-node, within which it multiplies for a few days. Necrosis of cells in the lymph-node next liberates virus, which enters the blood-stream but is immediately taken up by the phagocytes of the liver and spleen and possibly the bone-marrow. Contiguous cells of these organs are infected, with a great increase in the concentration of virus. Virus particles are next liberated directly into the blood-stream by necrosis of the infected cells lining the sinusoids of those organs. This secondary viræmia, which is first evident on the fourth day after infection, leads to widespread focal infection of the epidermal cells, virus being first detected in the skin on the sixth day. By this time the titre of virus in the primary lesion has reached a high level, and for the first time there is obvious œdema at the site of entry of the virus, and the incubation period has come to an end.

This œdema increases, ulceration follows, and the mouse liberates virus into the environment—i.e., it is infective. Meanwhile virus multiplies rapidly in the liver and spleen and may so destroy the cells of these organs that both become almost completely necrotic and the mouse dies. Multiplication of the virus in the skin lags behind that in the liver and spleen, for the skin is not infected until the period of the secondary viræmia developing from the fourth day onwards. If death occurs before the eighth or ninth day, as acute deaths usually do, no skin lesions are found, but the virus content of the skin is high and microscopic sections may show many inclusion bodies within the epidermal cells, the distribution of groups of infected cells being focal. If multiplication of virus in the liver and spleen is less extreme and the animals survive the acute phase of the disease, œdema of the epidermal cells becomes clinically obvious as pale macules, which rapidly become papular and ulcerate owing to necrosis of the superficial cells. The massive liberation of virus which then takes place is responsible for the high infectivity of mice at this stage. By this time the circulating antibody has reached a high titre and skin sensitisation to the virus can also be elicited. Antibody prevents the virus from infecting new cells, and the virus content of all organs and tissues rapidly falls, with recovery of the infected animal.

This picture of the pathogenesis of the virus disease mousepox closely resembles that drawn by Ørskov (1932) (see also Madsen 1937) from his classical investigations on mouse typhoid. The main difference, which is of some importance for our later argument, is that in mousepox the natural portal of entry of the virus is the skin, a tissue for which the virus has a high affinity and in which prolonged multiplication takes place, with the production of a macroscopic primary lesion. In mouse typhoid, and probably in several other bacterial and virus diseases, local multiplication of the micro-organism at the portal of entry does not produce a clinically recognisable primary lesion.

TABLE I—OCCURRENCE OF VIRUS IN SEVERAL ORGANS AT INTERVALS AFTER INFECTION BY THE APPLICATION OF "MOSCOW" ECTROMELIA VIRUS TO THE EAR

Material	Hours after infection				Days after infection				
	1	2	4	8	1	2	3	4	5
Pinna ..	+	+	+	+	++	+++	+++	+++	++++
Regional lymph-node	0	0	0	+	+	++	+++	+++	++++
Blood ..	0	0	0	0	0	0	+	++	++
Liver ..	..	..	..	..	0	0	++	+++	++++
Spleen ..	..	..	..	..	0	0	++	+++	++++

COMPARISON WITH OTHER EXANTHEMS

Table II, which includes much that is speculative, summarises present knowledge of the length of the incubation period, the occurrence of clinically apparent or postulated primary lesions, and the interval between the onset of the disease and the appearance of the rash in many human and a few animal diseases. It is not suggested that in all these the pathogenesis is similar to that of mousepox, but it may be useful to think of them in terms of a primary lesion at the site of entry of the bacterium or virus, an early primary bacteræmia or viræmia, and localisation and multiplication of the organism in some internal organ, which is usually the liver, spleen, or bone-marrow. From here it may be reliberated in much larger amounts into the blood-stream, leading to a second series of foci of infection, which

TABLE II—COMPARISON OF MOUSEPOX WITH VARIOUS OTHER EXANTHEMS

Disease	Usual mode of spread	Site of primary lesion (C, clinically-apparent)	Usual length of incubation period (days)	Interval between end of incubation period and appearance of rash (days)	Presence of organisms in lesions of rash
Virus diseases:					
Mousepox	Contact	Skin (C)	7	2	+
Rabbitpox	? Contact or ? airborne	? Upper respiratory tract	5	0–1	+
Smallpox	Airborne	Upper respiratory tract	12	3	+
Inoculation smallpox	Intradermal inoculation (variolation)	Skin (C)	3–4 (local lesion) 8 (symptoms)	6 (from local lesion) 2 (from symptoms)	+
Generalised vaccinia	Intradermal inoculation	Skin (C)	3–4	4	+
Varicella	Airborne	Upper respiratory tract	16	0–1	+
Measles	Airborne	Upper respiratory tract	10	4	+
Rubella	Airborne	Upper respiratory tract	16	0–1	?
Dengue	Intravenous inoculation (mosquito)	? In internal organs	6	4–5	?
Diseases of unknown ætiology, possibly due to viruses:					
Infectious mononucleosis	? Airborne	? Upper respiratory tract (C)	8	7	?
Pityriasis rosea ..	?	? Skin (C) (herald patch)	? 4–10	7	?
Rickettsial diseases:					
Tsutsugamushi ..	Intradermal inoculation (mite)	Skin (C)	12	6	+ (in endothelial cells of capillaries)
Murine typhus ..	Subcutaneous inoculation or inhalation	?	10	5	+ (in endothelial cells of capillaries)
Bacterial diseases:					
Typhoid fever ..	Ingestion	Throat (C, rarely) Intestine	12	7	+
Meningococcal septicæmia (spotted fever)	Airborne	Upper respiratory tract	?	0–2	+
Scarlet fever ..	Airborne	Upper respiratory tract (C)	3	2	– (toxin)
Spirochætal diseases:					
Syphilis	Contact	Skin (C)	28	21	+

may include the epithelial cells of the skin or the endothelial cells of capillaries in the dermis. Subsequent multiplication of the organism in the skin would then cause the characteristic rash.

Rabbitpox and Rabbit Vaccinia

Before discussing the human exanthems it is desirable to consider briefly animal diseases other than mousepox which are characterised by a rash. The only ones on which any detailed investigations have been made are generalised vaccinia of rabbits (Douglas et al. 1929, Pearce et al. 1936), rabbitpox (Greene 1934, Hu et al. 1936), and rabbit plague (Jansen 1946). These diseases are caused by closely related viruses, and the last two may be due to modified laboratory strains of vaccinia virus.

There is no exact information available on the natural mode of spread; possibly the infection is airborne or is transmitted by contact. No statement is possible, therefore, on the site of the primary lesion. A large amount of virus is certainly disseminated by the blood-stream at the latter end of the incubation period, and there is ample evidence that the skin lesions are due to multiplication of virus in the dermis and sometimes in the epidermal cells. In both diseases virus was isolated from the skin lesions, and in certain outbreaks (Greene 1934) inclusion bodies were observed in the epithelial cells. Greene also noted that several crops of skin lesions sometimes developed, corresponding, on our interpretation, to several successive seedings of the dermal cells with virus distributed via the blood-stream.

Ørskov and Andersen (1938) applied the methods of investigation which had been so fruitful in elucidating the pathogenesis of bacterial diseases of mice to the study of the mechanism of infection of vaccinia in rabbits. After intradermal inoculation they found the same process of regional involvement of lymph-nodes on the first day, and multiplication of virus in the liver and spleen, with secondary viræmia, on the third day. In very young rabbits (two and three days old) virus was demonstrated in the liver and spleen on the first day, and in animals which survived long enough hæmorrhagic foci, due to further generalisation of the virus, were noted in the kidneys and skin. In addition, multiplication of virus in the skin at the site of inoculation produced a local lesion there. The parallel to ectromelia in mice is close, but with the doses used the incubation period was much shorter in vaccinia in rabbits than in ectromelia in mice.

Variola and Vaccinia

The closest human analogues of mousepox are undoubtedly smallpox, alastrim, and generalised vaccinia, and these diseases may well be discussed together. In generalised vaccinia and inoculation smallpox the analogy with mousepox is direct, for in all three the primary lesion is in the skin. In natural smallpox and alastrim available evidence suggests that the virus enters the susceptible host through cells of the respiratory tract. Paschen (1932) reported that he had obtained evidence of infection of the throat, with multiplication of the virus in that site in contacts examined during the incubation period. He relied on the demonstration of elementary bodies in stained smears, a technique which is open to error and difficult to put on a quantitative footing. It is highly desirable that this question should be reinvestigated by the chick-embryo method of titrating the virus. In this way definite information on the site of primary infection and the periods of infectivity of variola could be obtained. The infectivity of early cases of variola, before necrosis of the skin has liberated virus there, is almost certainly due to nasopharyngeal lesions, which may be due to the primary lesion there or perhaps to the early ulceration of the secondary lesions when they develop on mucosa.

Paschen suggested that, after multiplication in the throat, the lungs were invaded, with later secondary liberation of virus through the blood-stream and infection of the skin and other organs. It seems more likely that virus particles which entered the blood-stream via the lymphatics to cause the primary viræmia would be taken up generally by macrophages lining the sinusoids of the spleen, liver, and bone-marrow. Titration of the virus content of various organs from fatal cases of variola might indicate their relative importance in this respect.

There is no doubt that the skin lesions of variola and generalised vaccinia are due to multiplication of virus in the epidermal cells, and there is good evidence that this multiplication proceeds in apparently normal skin for some days before lesions become evident. Downie and Dumbell's (1947) plate shows almost universal infection of the epithelial cells in an early smallpox lesion of the human skin, and Dible and Gleave (1934) demonstrated early histological changes with inclusion bodies in the cells in apparently normal areas of skin in a fatal case of generalised vaccinia. Comparison of the histological descriptions of Dible and Gleave with the sections obtained in mousepox makes irresistible the conclusion that the pathogenesis of the rash is the same in the two conditions. The differences in appearance of the lesions can be explained by the much greater thickness of the epidermis in man.

Varicella

Experimental investigations on the virus of varicella are very meagre, Rivers's (1926, 1927) production of lesions with characteristic intranuclear inclusion bodies in the testes of vervet monkeys inoculated with vesicle fluid being the only accepted transmission to experimental animals. Several investigators have produced varicella in children inoculated with vesicle contents, Steiner's (1875) observations being the most reliable. The children that he inoculated in the arm with clear vesicle fluid became feverish on the fourth day. Constitutional symptoms increased and the characteristic rash appeared on the eighth day. The short incubation period parallels that observed in inoculation variola, and is probably due to the larger dose of virus and its more rapid passage to the internal organs than in natural infection. Elementary bodies, which are probably varicella-virus particles, can be demonstrated in the vesicle fluid by differential centrifugation and are specifically agglutinated by varicella convalescent serum (Amies 1933).

Tyzzer (1905–6), investigating the histology of the skin lesions of varicella, found characteristic eosinophil intranuclear, and less commonly intracytoplasmic, inclusion bodies in cells of the dermis and epidermis in affected areas. The earliest changes, which long preceded the appearance of the vesicle and were much more widespread than the vesicles, were seen in the endothelial cells of dermal capillaries. The appearance of inclusion bodies in these very early lesions, and their great multiplication in cells of the epidermis before the characteristic degenerative changes which led to vesicle formation, suggest that the pathogenesis of the rash of varicella is much the same as that of smallpox and mousepox, virus being widely distributed by the blood-stream some days before vesicles develop.

The site of the primary lesion in the natural disease is almost certainly the upper respiratory tract. Mild inflammatory lesions of the nasopharyngeal mucosa appear in the earliest stages (Stokes 1943) and discharge virus. The sites of the internal foci of multiplication of the virus are unknown.

Measles

The primary lesion of measles is undoubtedly in the upper respiratory tract. Cases are infective for at least five days before the rash appears (Box 1946), and lesions of the throat are the first that can be detected.

In human measles the virus has been demonstrated in nasopharyngeal washings collected when Koplik's spots are plentiful, just before the appearance of the rash, and in blood drawn at various periods extending from just before the appearance of the rash until two days after its appearance (Rake and Shaffer 1940, Shaffer et al. 1941). The most important study on the pathogenesis of measles, however, is that of Blake and Trask (1921) on simian measles. They found that the incubation period of simian measles was about seven days when large amounts of nasopharyngeal washings or tissue suspensions were inoculated intratracheally. By the subinoculation of 10 ml. of citrated blood collected from an inoculated monkey, which subsequently developed Koplik's spots on the eighth and a rash on the eleventh day, these workers could not demonstrate virus in the blood on the second, third, or fourth day of the incubation period, but obtained a positive result with blood drawn on the fifth, sixth, or seventh day. There was no means of deciding which specimen or specimens were positive, since all samples were inoculated into the same monkey. Blood drawn after the seventh day was always positive until the animal was killed on the thirteenth day. When infective blood drawn after the seventh day was inoculated intravenously the incubation period was only four days, suggesting that the interval between establishment of the primary lesion and the secondary viræmia had been eliminated.

The shortening of the incubation period by the intravenous inoculation of large amounts of virus is also seen when the fœtus becomes infected: for, when there is a miscarriage due to measles, it is often found that the fœtus has a rash at about the same stage as that of the mother (Kohn 1933). Some of Shuman's (1939) cases of varicella in the newborn showed the same feature.

Blake and Trask's (1921) investigations also showed that Koplik's spots were part of the rash and not the primary lesion of measles, for they appeared after both intratracheal and intravenous inoculation. Further, virus was demonstrated in the minced buccal mucosa and skin of infected animals.

The data just outlined show that the pathogenesis of measles is similar to that of mousepox, and von Pirquet's (19 13) theory that the regular course of the measles eruption was the expression of an allergic response to measles is untenable.

The internal focus of proliferation of the virus is unknown, but the spleen, which is often enlarged, is probably one such site.

Dengue

Dengue is not usually regarded as one of the acute exanthems. Its incubation period is shorter, and this may be due to the fact that, because the virus is inoculated intravenously by the mosquito, the interval of three or four days between infection and the proliferation of virus in the internal organs is eliminated. The situation may be compared with variola, measles, and chickenpox in the newborn, with Blake and Trask's (1921) production of measles with an incubation period of four days by the intravenous inoculation of monkeys, and with the results (Fenner 1948b) of the intravenous and intradermal inoculation of mice with ectromelia virus. Sabin and Schlesinger (1945) have shown that enormous concentrations of virus occur in the blood; and, though no direct evidence is available, the rash is probably due to multiplication of the virus in the cells of the dermal capillaries.

DISCUSSION

Several of the observed features of the exanthems can be explained by the hypothesis just enunciated. First, the long incubation period of the natural diseases, and the shorter incubation period of the same diseases after intravenous inoculation, and of dengue can be explained by the time necessary for the proliferation of virus in the primary lesion, in the regional lymph-node, and next in the internal focus in the natural disease, and the elimination of the first two stages when intravenous inoculation is the mode of infection. Differences in the reproduction-rates of different viruses and in different tissues are also important in this connexion (Fenner 1948b). Secondly, the delay of several days between the onset of symptoms and the appearance of the rash is due to the fact that symptoms ensue when multiplication in the primary focus or in the internal organs reaches a high level, whereas infection of the epidermal cells during the consequent secondary viræmia takes place at just about the time of the onset of symptoms. Multiplication of the virus in the skin must then proceed for a few days before lesions become evident. Thirdly, the long period of the secondary viræmia provides the massive and universal distribution of virus which leads to the very durable immunity produced by these diseases.

In textbooks of medicine the description of the symptoms of the more severe exanthems, smallpox and measles, is usually divided into the period of incubation, the period of invasion, and the stage of eruption. A consideration of the virus titres in the blood and other organs in mousepox (fig. 1), which is a valid model for smallpox and measles, shows how erroneous is this concept of pathogenesis. "Invasion" presumably means either the entry of virus into the blood-stream or the invasion of the organs by virus spread by the blood-stream. Both these events occur during the incubation period and do not give rise to symptoms. The principle that symptoms and signs develop only when multiplication of the virus has almost reached a maximum is of general application in virus diseases (Rivers 1939). In the acute exanthems the onset of symptoms is probably due to sudden widespread necrosis of the cells of the internal organs in which multiplication of the virus has reached a high level, with the consequent release of abnormal cell products into the circulation and the interference with normal metabolism. When the rash is fully developed, the virus content of all organs and tissues is declining, and in the absence of secondary bacterial infections it is accompanied by a decrease in the severity of general symptoms.

SUMMARY

Mousepox (infectious ectromelia of mice) is a good laboratory model for the study of the acute exanthems.

Multiplication of the virus at the site of entry of the virus reaches almost its highest titre before any lesion is evident macroscopically.

A complicated series of events occurs between infection and the end of the incubation period: the virus passes to the regional lymph-node and multiplies there; small amounts of virus pass into the blood-stream and undergo phagocytosis by cells of the reticulo-endothelial system; the virus multiplies in the organs (liver and spleen) rich in these cells, and necrosis of infected cells adjacent to sinusoids produces a secondary viræmia; and the virus thus distributed causes focal infection of cells of the epidermis. Virus deposited in the skin multiplies for several days before any macroscopic lesions appear. Clinical recovery and the disappearance of virus are closely correlated with the appearance of circulating antibody.

This interpretation of the pathogenesis of mousepox provides a good explanation of the known facts in smallpox, chickenpox, and measles.

It is suggested that the concept of a primary lesion (which may or may not be clinically apparent), an internal focus of multiplication, and a secondary liberation of the virus or bacterium into the blood-stream, with the

production of focal lesions in the skin and elsewhere, may prove useful in studies of the pathogenesis of many human diseases.

The description of the period of the onset of symptoms in smallpox and measles as the stage of "invasion" is erroneous, for the blood-stream and the organs are invaded during the incubation period before symptoms arise.

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SPLENECTOMY IN KALA-AZAR

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SPLENECTOMY has come to be regarded as entirely contra-indicated in the treatment of kala-azar since the introduction of pentamidine and potent pentavalent preparations of antimony, but the successful results recently obtained in three drug-resistant cases show that, combined with specific therapy, it can sometimes be the only method of obtaining a radical cure.

The treatment of kala-azar by splenectomy was first reported by Makkas (1912) in Athens. For three weeks the hæmoglobin and red-cell count improved, but the patient died of an intercurrent pneumonia. Makkas was so encouraged by this temporary improvement that *he examined the spleens in a pathological museum and found numerous leishmaniæ in one which had been removed from a patient diagnosed as having* Banti's disease. He traced the patient, who had been operated on a year previously, and found him in perfect health.

Cochran (1915) performed splenectomy in three cas of kala-azar in China; all three patients died, though tw showed temporary benefit for two months. Leishmani *were found in the liver sections.*

Kokoris (1915) recorded three cases of infanti kala-azar in Greece in which the diagnosis was confi by finding leishmaniæ on *splenic puncture.* Splenectom was performed in each case. The first child continued t have fever *and died four months after the operation* the second improved temporarily, but later the feve returned and he was removed from hospital by his parent two months after the operation; and the third chil improved rapidly and remained well for over thre years. This is the first proved case of kala-azar recorde in which splenectomy alone was followed by recovery.

SPLENECTOMY IN UNRECOGNISED KALA-AZAR

There is no doubt that splenectomy has been done i many cases of unrecognised kala-azar and not reporte These cases have invariably been mistaken for Banti syndrome, and the fallacy of excluding kala-azar o one *negative sternal marrow or splenic puncture* must b guarded against if this mistake is to be avoided. Th modern laboratory aids to diagnosis, such as culture fro sternal marrow and spleen punctures on suitable med and the complement-fixation test of Sen Gupta, shou in most cases prove sufficient. We have, howeve encountered a case where three sternal-marrow punctur *were negative and it was only on splenic puncture* th the diagnosis was made. Provided specific treatme *is instituted as soon after operation as possible,* t prognosis is by no means hopeless.

Olmer (1931) records the case of a young man, wh had never lived out of France, reporting sick with *pyrexia and a grossly enlarged spleen.* A puncture the enlarged spleen having failed to reveal leishman splenectomy was performed. Death resulted fro *hæmorrhage, and at necropsy numerous* leishman were found in the spleen. Kala-azar in young childr *is common in Marseilles, but this appears to be the* fi *reported case in an adult.*

Sweeney et al. (1945) reported a case of kala-az simulating splenic anæmia. An Italian prisoner-of-w contracted the disease in Sicily. The disease, follow a presumptive latent period of two years, manifest itself by pyrexia, gross splenomegaly, and a leucopen with a relative lymphocytosis. Frequent blood smea were negative for malarial parasites, and numero *sternal-marrow smears* were examined for leishmaniæ wi negative results. A Napier's aldehyde test was not don In 1944 the spleen was removed *on a tentative* diagnosis Banti's disease. The spleen weighed 1770 g. and on sectio showed numerous leishmaniæ. A course of '*Neostibosan*' was given after the splenectomy up to a total dose *of 4·7 g., and the patient completely recovered.*

The following case occurred in a R.A.F. station hospit in 1945.

Case 1.—*An airman* who had recently returned from Indi was admitted to hospital with a palpable *mass* in his lef *hypochondrium. He was anæmic, and there* was a leucopenia His urine contained a cloud of albumin and some blood *A sternal-marrow* smear showed no leishmaniæ, and no malaria parasites were seen in repeated blood films. A *surgical con* sultant advised laparotomy, and at operation a *very* larg spleen was found and removed. Leishmaniæ were *pres* in the smears from the cut surface of the *spleen* (fig. 1) '*Pentostam*' *was given on the day after operation,* and further courses were given later up to a total of 14·2 g The spleen weighed 3111 g., and *sections showed* numerous leishmaniæ. The patient ultimately made a good recovery after a stormy convalescence, *during which* 11 blood transfusions were given.

SPLENECTOMY IN DRUG-RESISTANT CASES OF KALA-AZAR

Timpano (1930) reported a case of *kala-azar* in a child, aged 5 years, who was treated with tartar emetic.

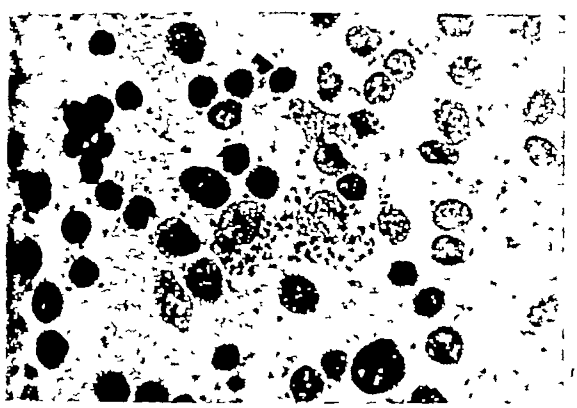

Fig. 1—Leishmaniæ in smear from cut surface of spleen (case 1).

Her condition deteriorated in spite of treatment, so a splenectomy was performed. The fever quickly subsided after operation, and rapid improvement followed. Two months later the child was in good condition and was discharged as cured.

Abrami et al. (1931) reported a case which, though it does not strictly conform to this category, presents some interesting features. A woman, aged 35, who for the past ten years had lived in France, England, and Germany, was found to have kala-azar. It was concluded that the disease had been contracted in France, on the Mediterranean littoral. Because of the advanced stage of the disease splenectomy was performed, and next day 10 cg. of 'Stibenyl' was administered. This was followed by a course of neostibosan, but a blood-transfusion had to be given on the nineteenth day, and a month later a further course of neostibosan was given, followed by complete recovery.

Martin et al. (1935) reported a case of kala-azar in a Russian man, aged 21, which had been contracted in the south of France. A course of neostibosan up to a total dose of 4·6 g. was followed, after six days' rest, by a course of 'Stibyal' up to 0·2 cg. The temperature [illegible], and the appetite improved, but the anæmia and splenomegaly did not improve. A blood-transfusion was given, but six days later the blood picture showed Hb 45%, red cells 1,800,000 per c.mm., and white cells 3200 per c.mm. A splenic puncture revealed numerous leishmaniæ and was followed by internal hæmorrhage which lasted some hours. Four days later splenectomy was done. A further course of neostibosan up to a total of 6 g. was given and followed by a further 0·84 cg. of stibyal. The patient made a complete recovery.

Burchenal et al. (1947) have reported a drug-resistant case in which splenectomy was undoubtedly the determinant factor in recovery. A negro soldier contracted the disease in North Africa in 1944. Leishmaniæ were found on splenic puncture, and intensive treatment with pentavalent antimony preparations and stilbamidine for the next eighteen months did not effect a cure, and it was only with 85 blood-transfusions of 500 ml. each that the patient was kept alive. Eventually splenectomy was performed, and a spleen weighing 3050 g. was removed, in sections from which leishmaniæ were found. No further specific treatment was given after splenectomy, and the patient made an excellent recovery, being in perfect health two years after the operation.

Case 2 (Prof. L. J. Witts's case).—A soldier who had served for three years in the Sudan and the Mediterranean littoral was taken ill some four months after he had returned to England, and was admitted to a military hospital. He had pyrexia for eleven weeks and was investigated fully during this period, with negative results. A Napier aldehyde test was negative for kala-azar on April 1, 1944. His spleen gradually enlarged until its lower border reached the umbilicus. No diagnosis having been made, he was transferred to the Radcliffe Infirmary under Professor Witts on May 22, 1944. A sternal puncture was done, but no leishmaniæ were seen. He was given a course of neostibosan, which had only a slight effect on his temperature. A second course was begun on July 8, 1944, and two blood-transfusions were given. On June 27, 1944, a blood-count showed 3,250,000 red cells per c.mm., Hb 62%, and white cells 2600 per c.mm. Splenectomy was performed by Mr. D. C. Corry on Aug. 1, after which the patient's temperature subsided, and for his last three weeks in hospital he was afebrile. A course of 'Neostam' was given after the splenectomy. Smears from the cut surface of the spleen revealed leishmaniæ. Sixteen days after splenectomy a blood-count showed red cells 4,790,000 per c.mm., Hb 94%, white cells 8000 per c.mm. (polymorphs 47%), and platelets 1,500,000 per c.mm., a previous count on May 23, 1944, having shown 146,000 per c.mm. The patient was transferred to a convalescent home and was finally discharged from the Service. He was seen again in November, 1946, and there had been a steady gain in weght since his operation in 1944. A blood-count showed Hb 104%, and white cells 10,000 per c.mm. (polymorphs 51%). His erythrocyte-sedimentation rate was 2 mm. in an hour.

This case showed a lymphocytosis following splenectomy which was also evident in the next case.

Case 3.—A corporal, aged 24, developed kala-azar in Calcutta in December, 1945. A provisional diagnosis of typhoid fever was made, but a month later leishmaniæ were found in a sternal-marrow smear, and he was given a course of 'Urea stibamine,' with an excellent immediate effect. His pyrexia subsided, and the spleen was no longer palpable. He received no further treatment until he arrived in England in April, 1946. On examination he had an enlarged hard spleen some 2 in. below the costal margin, his white-cell count was 5000 per c.mm., a Napier aldehyde test was negative, and so was Sen Gupta's complement-fixation test. A sternal-marrow smear was negative for leishmaniæ, and cultures made from the marrow on Alder's media were sterile at the end of three weeks. The patient was feeling well, was apyrexial, and was anxious to go on sick leave. In spite of these negative findings we decided to give him

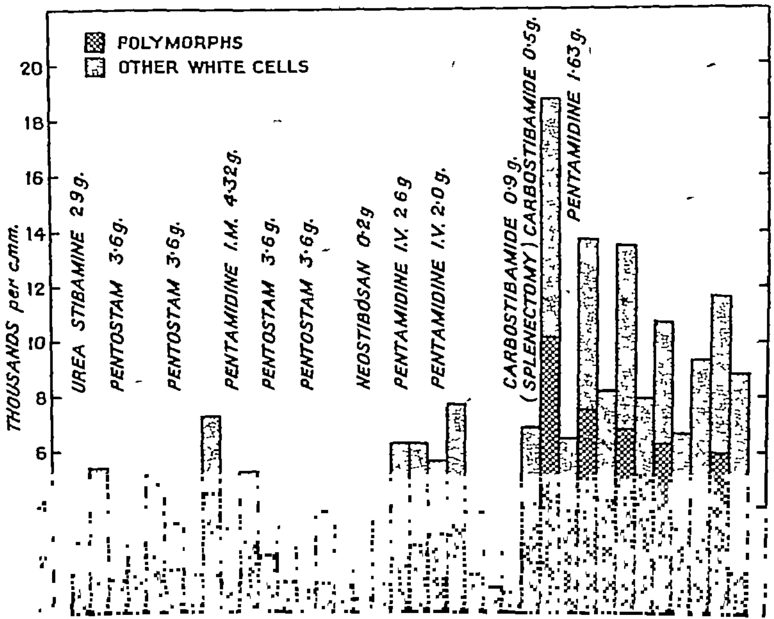

Fig. 2—Treatment and white-cell counts in case 3.

a full course of pentostam forte up to a total of 3·6 g. The course was started on April 24, 1946, and his white-cell count rapidly fell to 2500 per c.mm. This fall, mainly affecting the polymorphs, recurred shortly after the start of treatment with antimony preparations on every occasion (fig. 2) and, though noted, was neither so well marked nor so constant in other cases.

On his return from a month's sick leave he felt well; he had taken his temperature every night, and had only noted it slightly raised once when he had a cold. He had walked five miles a day during the last week of his leave. The spleen was still palpable $2^1/_2$ in. below the costal margin, there was a well-marked gingivitis but no other signs or symptoms, and he was apyrexial. Sternal-marrow smears were, however, positive in the direct smear and later on culture. A further course of pentostam forte up to a total of 3·6 g. was given. Sternal-marrow smears and cultures were negative after this course, and he was given a further month's sick leave.

After this he complained of being easily tired, and his spleen, which had regressed after the pentostam, was 3 in. below the costal margin. It was decided, in view of his intolerance to antimony, to give him a course of pentamidine isethionate intramuscularly up to 4·32 g. Sternal-marrow smears were negative after this course, but to our disappointment leishmaniæ grew three weeks later from cultures made from the sternal marrow. Further treatment was given (fig. 2) from Oct. 10, 1946, with various antimony preparations and pentamidine, with good initial response so far as the pyrexia was concerned and occasional regression of the spleen, but there was a steady deterioration in his condition.

A course of neostibosan had to be terminated hurriedly after two injections, since his white-cell count fell from 3000 to 900 per c.mm. (polymorphs 22%), and he had a severe epistaxis. Pyridoxine was given together with liver injections, with a good effect on his white-cell count, and further intensive treatment was given with intravenous pentamidine preceded by adrenaline hydrochloride min. 10 of 1/1000 solution intramuscularly. Thrombosis of many veins was caused by the pentamidine, but it was possible to complete the courses. The spleen became impalpable, and the irregular temperature which had been running for four weeks subsided. Sternal-marrow smears and cultures were negative, and it was hoped that the intravenous pentamidine had at last effected a cure.

On his return from a month's sick leave his spleen was again enlarged to $2^1/_2$ in. below the costal margin, and a blood-count showed red cells 3,300,000 per c.mm., Hb 60%, and white cells 1800 per c.mm. A sternal-marrow smear was negative on direct examination, even after an hour's search by five observers. A spleen puncture was done three days later, and the splenic smear was found to be packed with leishmaniæ. It was considered that his spleen was the reservoir of his infection, and it was decided to begin a course of 'Carbostibamide' and in the middle of the course to perform a splenectomy, continuing with the course as soon as the patient's condition permitted. A blood-transfusion was given during the operation, and Air-Commodore P. Hall removed an enlarged spleen weighing 2736 g. Smears and sections from the spleen were full of leishmaniæ, and positive cultures were obtained on Adler's medium. There was an immediate rise in the white-cell count after splenectomy. The course of carbostibamide was completed and was followed by a short course of intravenous pentamidine up to a total of 1·63 g.

The patient became completely apyrexial a fortnight after his operation, and has remained so for the last six months. There has been a gradual increase in weight; he now weighs 12 st. and is back at his work as a motor-transport driver. A blood-count shows red cells 5,600,000 per c.mm., Hb 100%, and white cells 7000–10,000 per c.mm. (lymphocytes 55–65%). A similar lymphocytosis after splenectomy has been reported in other cases and is apparently due to the splenectomy. The patient's liver is not enlarged, liver-function tests are satisfactory, and there is no enlargement of lymph-glands.

Case 3 presents several interesting points for discussion.

Drug-resistance.—It was fortunate that successful cultures were obtained early in the disease and again at splenectomy. Inoculation into hamsters, which were treated with pentostam, showed that the strain had not developed "drug-fastness." The fault therefore lay in the patient and not in a particularly antimony-resistant strain of leishmaniæ.

Persistently Negative Complement-fixation Test (Sen Gupta).—The fact that the antigen is made from the Kedrowsky acid-fast bacillus, and is therefore not a specific antigen for kala-azar, weakens the argument that the fault lay in the immunity response of the host: but in fairness to Sen Gupta's test it must be admitted that this was the only positive case of kala-azar in which the test was negative. In many of our cases a strongly positive complement-fixation test gradually became weaker and finally negative during treatment, and we consider that Sen Gupta's complement-fixation test is as reliable as any of the other complement-fixation tests, not excluding the Wassermann reaction.

Inadequate Dosage in the Initial Stages of the Disease.—This we consider to have been an important factor in our case. The initial course of urea stibamine consisted of only 2·9 g., and there was an interval of two months during which the patient was awaiting repatriation. On the other hand, Napier with his unique experience of kala-azar in India, has found no correlation between irregular inadequate treatment and drug-resistance. Some of his most resistant cases were adequately treated as inpatients. Kirk (1947) states that "cases which relapse after insufficient treatment are subsequently much more difficult to treat than primary cases." Manson-Bahr (1945) says of urea stibamine: "If for some reason or other an intermission in treatment takes place, the parasites tend to become antimony-fast."

Spleen as a Reservoir of Infection.—In adequately treated cases resistant to intensive specific chemotherapy we consider that the spleen is the reservoir of infection. Sections in our case showed a diffuse reticulo-endothelial proliferation in the spleen, and it is suggested that, owing to pooling and stagnation of the circulation in the splenic sinuses, an effective concentration of the drug did not reach the parasites in situ. It is suggested that the specific drugs destroyed the parasites in the bone-marrow, thus explaining the numerous negative marrow smears and cultures in this case. It is significant that marrow smears were negative, but two days later a spleen smear was teeming with leishmaniæ, and it was on this finding that splenectomy was considered. The spleen in section showed numerous leishmaniæ, and since it weighed 2736 g., the extent of the parasitisation is obvious. The splenic fibrosis in these resistant treated cases is possibly due to the antimony and not to the disease.

CHANGES IN THE WHITE-CELL COUNT AFTER SPLENECTOMY

The following white-cell counts before and after splenectomy have been recorded:

	White cells per c.mm. *Before*	*White cells per c.mm.* *After*	*No. of days after*
Martin et al. (1935)	3200	5400	16
Sweeney et al. (1945)	1800	12,800	Not known
Burchenal et al. (1947)	2900	22,500	1
Present series:			
Case 1	2200	4300	3
Case 2	2600	8000	16
Case 3	1800	6200	6

Singer et al. (1941) followed up 10 cases in which splenectomy had been done for various diseases, mainly purpura and hæmolytic jaundice, and found that, even after several years, the white-cell count was definitely raised (above 10,000) in 12 cases. The neutrophils were less than 60% in 15 cases, and the lymphocytes and monocytes were generally increased both relatively and absolutely.

Case 3, though a relative and absolute lymphocytosis was present, responded to a streptococcal tonsillar infection with a well-marked polymorph leucocytosis.

SUMMARY

Splenectomy in a very resistant case of kala-azar appears to have effected a cure, after sixteen months of intensive treatment with various pentavalent antimony preparations and pentamidine had been unsuccessful. The splenectomy was done in the middle of a course of carbostibamide, which was completed after the operation. A further course of pentamidine was then given, and fortnightly examinations and blood-counts have been carried out for six months. There is now no clinical or laboratory evidence of kala-azar, and the patient is well and on full duty.

Negative marrow smears are insufficient to exclude the diagnosis of kala-azar.

Splenectomy should be considered in selected drug-resistant cases of kala-azar, and the operation should be followed by a further course of chemotherapy.

Every case of kala-azar should be kept under close medical surveillance for at least six months.

We wish to thank the Director-General of the R.A.F. Medical Service for permission to publish this case; Dr. Everard Napier for his helpful criticism; Professor Witts for allowing us to quote his case; Dr. L. G. Goodwin, of the Wellcome Tropical Laboratories, for inoculating cultures into hamsters and testing the susceptibility of the strain to pentostam; and the patient (case 3) for his coöperation during a long illness.

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THE MALE-TOAD TEST FOR PREGNANCY

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INJECTION of urine into animals has been used for the last twenty years as a test for pregnancy. Many different animal species have been recommended for the purpose, but only a few have been accepted as suitable for routine use in clinical pathology.

The original test, described by Aschheim and Zondek (1928), is widely employed, for it is simple and reliable. From three to five immature female mice are given injections of urine twice daily until five injections have been given, and are killed 90–100 hours after the first injection. At laparotomy the ovaries are inspected. Hæmorrhagic follicles indicate a positive result. Supplies of immature mice are not universally available, and without concentrating the urine a result is not obtained before five days.

Friedman (1929) reduced the time of the test, without losing accuracy, by using segregated virgin rabbits. Urine is injected intravenously, sometimes on two successive days, and the ovaries are inspected 48 hours after the first injection. Some samples of urine are toxic enough to kill the rabbits, which latterly have become costly and difficult to obtain.

Bellerby (1934), in this country, and Shapiro and Zwarenstein (1934), in South Africa, introduced the female clawed toad (*Xenopus lævis*) as the test animal. Subcutaneous injection of urine from a pregnant woman causes extrusion of spawn (oviposition) within 24 hours, usually within 6–18 hours. The chief advantages of this test are the clear and rapidly obtained end-point and the low maintenance costs. The toads may be used repeatedly, and one feed a week seems to be adequate. Up to now this test has not been adopted generally. In nearly all cases previous chemical extraction of the urine (Scott 1940) becomes necessary, and to obtain good results two or three toads should be used for each test.

The early enthusiasm for the rat test (similar in execution to the Aschheim-Zondek test) has lagged, at least for clinical purposes. Bunde (1947) could not confirm the accuracy claimed by Salmon et al. (1942), particularly as the test does not have a clear end-point.

I report here my results of using as test animals male toads of the species *Bufo arenarum* Hensel, indigenous to South America, which was first used for pregnancy diagnosis by Galli Mainini (1947).

PRINCIPLE OF THE TEST

In frogs and toads spermatogenesis and ovulation generally take place only during sexual activity, which usually lasts a few weeks in spring. Nearly all frogs and toads use amplexus without internal fecundation—i.e., the male clasps the female from behind with his fore limbs until spawning is over. The discharge of gametocytes is presumably under hormone control, but the agency which initiates it has remained undiscovered. In the male toad the liberation and expulsion of spermatozoa are controlled by the pars anterior of the hypophysis (Houssay and Lascano Gonzalez 1929). de Robertis et al. (1946) further showed that injection of pituitary gonadotrophins causes spermatogenesis at any season of the year.

In controlled experiments these and other workers, notably Rugh (1937), have followed, by histological examination, the effects produced on the testes. The spermatozoa normally lie in clusters attached to Sertoli cells. The effect of gonadotrophin is first signalled by swelling of the Sertoli cells, followed by detachment of skeins of spermatozoa into the lumen of the seminiferous tubules. These events occur rapidly, are obvious in 10 min., and are often completed within half an hour. The mature spermatozoa next pass quickly through the vasa deferentia into the ureters, whence they may be either voided or stored temporarily in the bladder.

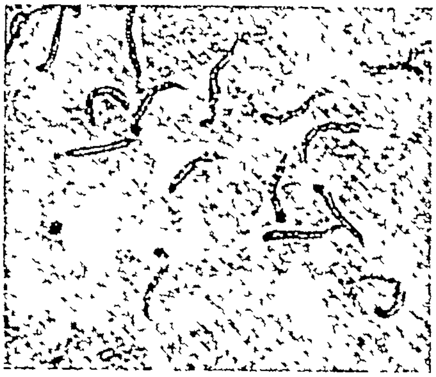
Galli Mainini (1947) gave practical application to these facts when he published results of parallel experiments substituting chorionic for pituitary gonadotrophins. He showed that injection of urine from the pregnant human female effected spermatogenesis in the adult male toad, and that spermatozoa appeared in the toad's urine within a short time (average 3 hours) of the injection. The adoption of these experimental results as a basis for a biological test for pregnancy depends on one further point—namely, that spermatozoa are never discharged into the ureters except in amplexus or as a result of experiment stimulus, as described above. This is true for those species already studied—*Bufo arenarum*, *Bufo marinus*, *Rana pipiens*, and *Bufo d'Orbigny*—and in each test it may be checked by sampling the toad's urine before an injection is given. So far as I am aware, all these species are indigenous to the New World.

TECHNIQUE

It is desirable to collect the first morning specimen of urine from the patient into a clean bottle. The toads seem to be unaffected by variations in bacterial or cellular content or in the pH of the urine injected. Therefore the urine requires no treatment before injection. I found that urine from patients who had recently undergone general anæsthesia was lethal to the toads (Haines 1948). It is therefore best to avoid injecting urine from women who have recently had anæsthetics or other forms of medication likely to be toxic to toads. Galli Mainini (personal communication) reports a mortality of 1·13% in over 2000 toads injected.

Bufo's skin is warty and usually dry and therefore, unlike xenopus, it is easy to hold. The position in which it may be held is a matter of choice, because the lymph sac can be reached from many different points. The lymph sac is a potential space between the skin and muscles almost all over the body of the toad; but the skin is firmly attached over joints and bony prominences such as the mandible and midline of the back. I find it convenient to grasp the body and four limbs of the toad in the palm of my left hand. This leaves uncovered an area of dorsal skin through which the injection is made.

The needle is passed into the skin at an acute angle and before reaching the muscle it is directed more horizontally so as to avoid puncturing viscera. The injection (10 ml.) is given slowly to allow the urine to diffuse. The needle is withdrawn after waiting $^1/_2$–1 min. to prevent reflux of urine through the needle puncture. Each toad is then placed in a separate well-ventilated dish or jar with enough water to allow the toad to soak himself if he wishes. The water should not be enough to cover him. The temperature of the room is important, for in cold weather the test is retarded. Good results are obtained at an average temperature of 22°C.



Positive pregnancy test, showing spermatozoa in male toad's urine after injection of pregnant woman's urine into toad's lymph sac. (No stain.) (× 400.)

The end-point of the test is given by the appearance of large numbers of spermatozoa in the toad's urine. Urine may be collected from the test jar if the toad has voided his bladder spontaneously or by catheterisation. This latter procedure is recommended and is simple to perform. In my experience 3 hours is a suitable interval between the injection and the taking of the first sample. This time the toad is held in the hand as before, but with his ventral aspect uppermost. A modified bulbed pasteur pipette is inserted into the cloaca to a distance of 0·5 cm. and not further than 1 cm. Usually a column of clear urine collects in the pipette within a few seconds. If not, gentle agitation of the pipette in the cloaca will cause urine to appear. A drop of the sample is examined microscopically, in the manner usually adopted for urinary deposits. In a positive test spermatozoa are seen in large numbers. They are often motile, but their presence is the criterion of the test. The heads of the toad spermatozoa (see figure) are much longer and narrower than those of man. The hair-like tail appears to be about three times as long as the head. Obviously, samples may be examined at any time during the test. I have taken samples after intervals of 1, 2, 3, and 4 hours. Sampling after 18–24 hours in positive cases showed that sperms were by then absent, or if present were few.

ADVANTAGES OF THE TEST

Before comparing this with other biological tests for pregnancy it is useful to consider what constitutes a good test. The important point is its reliability (see below). Other points are the collection and preparation of the urine for injection, the technique of injection, the speed of reaction, a clear end-point which is easily read, and the supply and maintenance of a stock of animals.

In most tests now in routine use the urine commonly receives some form of preparation before it is injected. This is because it may be toxic to some animals—e.g., mice and rabbits—or because the gonadotrophins need purification and even concentration before a response is obtained in the animals—e.g., the clawed toad (*Xenopus lævis*). Adjustment of pH followed by filtration is always required. Chemical extraction is often carried out if a contaminated specimen is received or a "rapid test" is requested. These procedures, though simple, demand a supply of reagents and apparatus, and add to the time of the test. No such preparation is needed in the male-toad test. Thus time is saved, and the test becomes, from the start, simpler than the others. A single subcutaneous injection is all that is required. In some other tests two or more injections may be needed. The male toad is much easier to hold than the female xenopus.

The earlier tests, Aschheim-Zondek and Friedman, are completed in 2–5 days. The introduction of the xenopus test reduced the time to less than 24 hours; readings are taken in 6–18 hours. With the male toad it is now possible to have consistent readings at the end of 3 hours. In fact, the nature of the reaction and experience shows that a test (under the conditions outlined above) which is negative at 3 hours will not become positive later. Thus there is no such thing as a "weak positive reaction" in this test. The xenopus test may be held to have the most clear end-point, but it varies in the degree of response. In some animals only a few ova may be seen; hence two or three clawed toads are needed for each test.

One of the disadvantages in the use of mice, rats, and rabbits is that the end-point is not clearly shown. An experienced worker can make reliable readings in of the doubtful cases, but occasionally the ovaries may have to be examined histologically. Reading the result of the male-toad test should cause no difficulties. The observation of large numbers of toad spermatozoa in a hanging-drop preparation of the urine requires no special skill. The whole operation of pipetting off the urine and its microscopical examination takes only a few seconds—not much longer than examining a jar for xenopus spawn.

Stocks of male toads have been easy and cheap to obtain. They require no special tanks or boxes. Each animal may be used for several tests. Toads live naturally for several weeks without food. If they are in good supply, those which have been used several times can be discarded before feeding becomes necessary, and a fresh stock obtained. On the other hand, the feeding of rabbits, mice, and South African toads needs care and is often costly. The supply of stock is discussed below.

RELIABILITY OF MALE-TOAD TEST

In his original paper Galli Mainini (1947) reported a parallel series of 99 tests on rabbits and male toads. There were 94 coincidental results, including 47 positives. As controls he used urines from miscellaneous cases and various hormones. Except with chorionic gonadotrophin, negative results were given in all cases. Reports confirming these results have been published by Figueroa Casas et al. (1947), Pinto and Suer Boero (1948), Lima and Pereira (1948), and many other workers in South America. In the U.S.A. the male leopard frog (*Rana pipiens*) is reported to give comparable results. Wiltberger and Miller (1948), after making tests on 200 of these frogs, reported no false positives, and no false negatives except in patients who had been pregnant longer than three months. Robbins and Parker (1948) obtained no false positives in 34 control urines, but there was 1 false negative in 78 urines from women known to be pregnant. This patient was only two weeks beyond her first missed period. Finally Galli Mainini (1948) has reviewed his own and published cases. In 2661 cases of pregnancy the accuracy of the test was 98–100%, including 458 cases of his own with an accuracy of [illegible]0%. He found no false positives in urine from 960 persons, including non-pregnant females of all ages and males. There were also 543 cases reported by other workers, again with no false positives. Thus, so far, the test appears to be 100% reliable in not giving false positives. The incidence of false negatives has been [illegible]2%. This apparent error is discussed below.

My experience is based on data obtained from 100 samples of urine and other substances injected into [illegible]6 toads (*Bufo arenarum*). Where possible, early morning specimens of urine were used. In all but 4 cases positive results were recorded 3 hours after the injection of urine. This was found to be a convenient time for reading tests, but over the whole series readings were made at 1, 2, 3, 4, and 5 hours after the injection. In only one instance a negative reading after 3 hours was followed by a positive one an hour later. This delay may have been caused by a temporary upset to the animal, because the patient had had an anæsthetic the day before the urine was collected. My results indicate that urine which does not give a positive reaction at the end of 3 hours, or 4 hours at most, never becomes positive under the conditions I use. On the other hand, positive readings were not usually found before 1 hour. But in one case, where the woman's period was nearly four weeks late, a positive result was obtained 45 min. after the toad was injected.

Several of the 11 patients for whom we obtained positive readings at the end of an hour had missed [illegible] one or two periods. One of our patients who was being investigated because of infertility was, on admission for the dilatation and insufflation, found to be four days late with her period. (Previously she had often been one or two weeks late.) Conception was confirmed by the male-toad test. Daily samples on three consecutive days gave positive results.

The 4 false negative results require further examination, and it is useful to view them in three groups, according to the duration of pregnancy. Thus in the first three months of pregnancy there were 38 cases with 1 negative result; in the second there were 6 cases with 1 negative result; and in the third there were 6 cases with 2 negative results. The specimen in the first group was obtained in difficult circumstances and was unusually dilute. It has been suggested that this specimen was too dilute to cause a reaction in the toad, but this explanation may not be adequate for I have found positive results after the injection of less than 10 ml.—e.g., 2·5 ml.—of early morning urine. In these early cases simultaneous Friedman tests were performed in 6, with agreement of 5 out of 6. The sixth patient's period was a week late when the toad test was positive, but the urine gave a negative in the Friedman test. Both tests were positive five days later. In this group with a small number of cases, the male-toad test appears to be reasonably reliable.

In the other groups the numbers are very small—6 cases in each. There was 1 negative reading in a case of eighteen weeks' gestation, and perhaps a dilute specimen was used. But it should always be borne in mind in interpreting biological tests for pregnancy later than the first three months, that there is a characteristic dip in the curve representing the excretion level of chorionic gonadotrophin somewhere between the sixteenth and twentieth weeks of gestation (Wright 1945). The effective level falls again towards term; hence the 2 false negatives (a third of the cases) which I recorded need not be scored against the reliability of the male-toad test in particular. As stated by Wiltberger and Miller (1948), it is only in the first three months that the need arises for a biological pregnancy test.

Besides cases of known pregnancy, other types of case were studied. There were 7 cases of clinically unexplained amenorrhœa. These were all in young women who thought they might be pregnant and who had had amenorrhœa for two or three months or less. All these patients gave negative toad tests. Friedman tests were negative in 2 cases, menstruation has restarted in 4, and 1 woman remains untraced. We found the toad test helpful in the differential diagnosis of 2 cases where menstruation has not restarted after confinement—amenorrhœa following pregnancy. One of these women had *not menstruated* since she had miscarried five months previously. The male-toad test was positive, and fœtal parts were demonstrated by X rays. The other woman had missed two periods after a normal confinement. The toad test and a confirmatory Friedman test were negative.

We studied 2 cases of complete abortion, in which the results of the toad test agreed with the clinical findings and progress of each case:

Case 1.—A primigravida, aged 27, with a gestation of eighteen weeks, was admitted to hospital with a week's history of recurrent vaginal bleeding. Ten days later the bleeding ceased, and it was hoped that the pregnancy might proceed. The toad test then was negative, and next day a macerated fœtus and a placenta were expelled.

Case 2.—A primigravida, aged 38, had had irregular menstruation and infertility. Her present pregnancy had been confirmed by a Friedman test. She was admitted because of threatened miscarriage. A toad test was positive. The test was still positive two days after the placenta had been passed. It became negative 100 hours after the placental separation.

The observations in case 1 have clinical but no scientific value. It is only possible to suggest that the placenta separated a few days before the test was made. However, the findings in case 2, in which clinical data and laboratory tests were carefully checked, agree with the view generally accepted—that biological tests for pregnancy give negative readings about 100 hours after all chorion has been detached. It is notable that Miller and Wiltberger (1948) found a negative reaction as soon as 18 hours after operative removal of a placenta in a case where the fœtus had been aborted 24 hours previously. The male-toad test was positive 6 hours after miscarriage. I feel that their statement "if the test is positive the placenta is still attached and alive" requires qualification.

The association of uterine fibroids and pregnancy is not uncommon and may lead to diagnostic difficulties. I have found positive toad tests in all 6 cases of this group—4 patients aged over 40 and the others aged 23 and 39. Biological tests are of special value in this type of case, because the future safety of the pregnancy can be controlled if an early diagnosis is made. On the other hand, amenorrhœa not associated with pregnancy may come on at the menopause and be accompanied by fibroids; 3 of my 6 cases, those aged over 40 and possibly the woman of 39, were in this category of pregnancy, fibroids, and menopause. The contemplated hysterectomy was not carried out.

I have no available data on cases of chorion carcinoma or vesicular mole other than one negative result in a patient who had passed a vesicular mole two months earlier. Further, it would be unwise to speculate on the results to be obtained in such cases. It should be more widely appreciated that hormone excretion in these cases is uncertain and often capricious. Probably the effective gonadotrophic result is more in keeping with a follicle-stimulating action and less in the luteinising effect associated with a physiological chorion (Zondek 1942).

My series of controls is small. A positive result was obtained at the end of 3 hours after an injection of 500 I.U. of chorionic gonadotrophins ('Gonan' B.D.H.) into the lymph sac. From other experiments it seems probable that 50 I.U. will readily evoke a positive reaction.

I have examined 25 toads at rest and found the urine free of spermatozoa in all of them. Negative results were obtained with urine from 12 patients under hospital care for conditions other than pregnancy, including uterine fibroids (2 cases) and menopausal amenorrhœa (3 cases). Injection of male urine (6 cases) gave negative results.

CONCLUSION

The new test merits further study. The number of cases I have studied is too small to warrant definite conclusions, but the results agree with much that has been published. The whole technique is very simple. One animal will serve for several tests. The end-point is clear and easy to read; it seems to be unique in having no gradations; and, because of the specificity of the basic reaction, false positives are not obtained.

SUPPLY OF STOCK AND MAINTENANCE

My present stock of toads was imported from South America as part of a traveller's luggage. Up to now *no other method of supply seems to be available.* If the need arises, arrangements for import might be made by travel agencies, as is done with South African toads. However, we should be able to find species of batrachians indigenous to the British Isles which would be just as suitable for this test and avoid the need to import from the New World.

Toads, whether from the New or the Old World, are easy to keep. They are not aquatic like fishes and *Xenopus lævis.* Placed in deep water they will not survive. They should be kept in large cages or glass-walled tanks. The floor of the terrarium is covered to a depth of 4 in, with a mixture of peat mould and sand, which is kept moist. A shallow tray of water is placed in one part of the cage. The toads can clamber in and out of this at will. They spend some hours, mostly at night, soaking in water. They must not be overcrowded, for they easily become asphyxiated. They feed on earthworms, mealworms, and cockroaches and other insects. In captivity they may refuse food, but normally they can exist for long periods without feeding. This is useful because several tests can be made on one batch of toads, which may then be discarded when they begin to lose weight—i.e., when they weigh less than 100 g. It is reasonable to discard a batch of toads in this way, because they have been easy to obtain and are cheap, the estimated cost being 6*d.* each. Each toad may be used again after an interval of six days. The cost of toads will depend on the supply and demand. If indigenous species are found suitable for the test, the price per toad may be expected to rise.

SUMMARY

Adult male toads of the species *Bufo arenarum* Hensel, indigenous to South America, are used in a new biological test for pregnancy.

Injection of 10 ml. of patient's untreated urine can give a positive result in 2–4 hours, indicated by the presence of masses of spermatozoa in the toad's urine.

In cases of pregnancy and in controls the favourable results of other workers have been confirmed. Additional results have been valuable in the study of abortion.

It is a pleasure to record my thanks to the surgeons of the Chelsea Hospital for Women, for their interest and coöperation with this study; to Mr. J. W. Law, A.I.M.L.T., for technical assistance; to the Keeper of Zoology, British Museum (Natural History), and to the Curator of Reptiles, London Zoological Gardens, for their help in identifying species and for advice on the care of the animals; and to Dr. Galli Mainini for help so freely given and for the active interest he has taken in the work.

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HUMAN TOXOPLASMOSIS IN ENGLAND

REPORT OF A CASE

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No case of congenital toxoplasmosis seems to ha been reported previously in this country. The conditi has been recognised only fairly recently, the first report case of human toxoplasmosis being described by Jan (1923), the second by Torres (1927), and the third Richter (1936). In these cases a protozoon was isolat which at the time was not identified as toxoplas but has since been so identified. Wolf and Cow (1937) described a case in which they named the organi *Encephalitozoon hominis*, and Wolf et al. (1939) describ another case in which the clinical features were simil to the previous five cases, and for the first time identifi the causal organism as a toxoplasma. Since then ma possible and proved cases have been described in t United States, South America, Continental Europe, a Australia (Pinkerton and Weinman 1940, Pinkerton a Henderson 1941, Sabin 1941, Wolf et al. 1942, Weinm 1944 and 1945, Zuelzer 1944, Dow 1945, Adams et 1946, Callahan et al. 1946, Robertson 1946, Syvert and Slavin 1946, Villegas 1946, Abbott and Camp 19 Binkhorst 1947, Robinson 1947, Kean and Grocott 194

DIAGNOSIS

There are two types of human infection—congeni and acquired. The congenital type, which so far h been the more commonly reported, may be manifest birth, or the symptoms may not appear until seve months later.

Hydrocephalus is one of the commoner and mo important signs, and may be associated with convulsion mental change and other signs of involvement of th central nervous system—e.g., "scissors" position lower limbs and deviation of head (fig. 1). In so cases microcephaly has appeared instead of hydrocephal

Chorioretinitis.—In the retina toxoplasmosis affec chiefly the macular region, though it may also affe the periphery of the fundus. White areas surround by pigment are seen, the intervening retina being norma Optic atrophy develops rapidly, but the vitreous remai clear.

Cerebral calcification (fig. 2) may not be present i the very early months but develops later. The mo characteristic appearance is curvilinear streaks calcification in the region of the basal ganglia or th optic thalamus; there may also be multiple round deposits 1–3 mm. in diameter.

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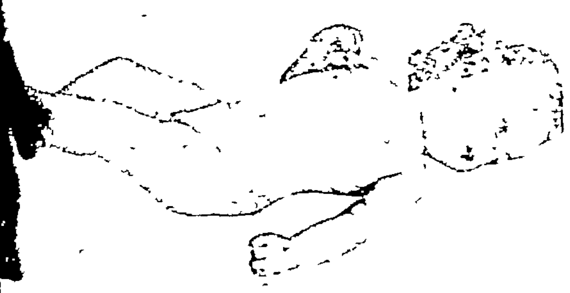
Cerebrospinal Fluid.—Though there may be no changes the cerebrospinal fluid (C.S.F.), the protein content ually increased, with perhaps xanthochromia.

Neutralising Antibody Test.—Sabin and Ruchman 42) devised a test for demonstrating neutralising antidies in the serum. In congenital toxoplasmosis the ts may be strongly positive in the mother and only kly positive, or even negative, in the infant. In acquired type Syverton and Slavin (1946) confirmed bin's (1941) observation that antibodies may be absent m the serum 7–10 weeks after the onset of the illness, d thus the absence of demonstrable antibodies does not e out the diagnosis.

Demonstration of Protozoon Toxoplasma.—The com- nest sites in which the toxoplasma has been found the brain, retina, nerves, and skeletal muscle; it occasionally been found in the C.S.F., lungs, kidneys, en, bone, lymph-nodes, heart, stomach, suprarenal ds, pancreas, diaphragm, subcutaneous tissues, and (Wolf et al. 1939 and 1942, Pinkerton and Henderson 1, Guimares 1943, Callahan et al. 1946, Pratt-mas and Cannon 1946, Kean and Grocott 1948). s, apart from a successful biopsy or a chance finding the C.S.F., the protozoon can usually be found only r death.

CASE-RECORD

male infant, aged 4 months, was admitted to the County pital, Pembury, with a history of persistent crying, ea, and enlarged head. He was born at full term after rmal pregnancy, with a birth weight of 7 lb. There



Child with congenital toxoplasmosis showing "scissors" position wer limbs, hydrocephalus, and deviation of head to the left.

no record of the head circumference at birth, and his r could not say when she had first noted the enlarge- nt. He had had a "stuffy" nose since birth, but had erwise progressed satisfactorily until a week before mission, when he had gone off his food and begun to cry ssantly.

Family History.—The child's family have lived in their ent home for the past seven years. The house was formerly cupied by a veterinary surgeon who practised there. The ent occupiers keep no domestic animals, but the house reported as rat-infested. The mother, father, and three her children (girls aged 7, 6, and $3^{1}/_{2}$ years) are all alive and ell, and have been examined by us, but no abnormality uld be found in any of them.

On examination the child was well-nourished but obviously ydrocephalic. Weight $13^{1}/_{4}$ lb., length $27^{1}/_{2}$ in., head cumference $17^{1}/_{2}$ in. The anterior fontanelle was very ge and bulging, and the posterior fontanelle patent. The ttal and coronal sutures were separated. Nothing abnormal detected in the heart, lungs, and abdomen, apart from a ld bronchitis and upper respiratory infection. Both eyes re slightly proptosed and deviated to the left, and stagmus was present. The pupils were equal and reacted ggishly to light. The fundi showed very extensive oretinitis, with a heavy deposit of pigment round parch-nt-white areas. There was also optic atrophy. So far could be judged, vision was negligible, but there may have en some appreciation of light. No other abnormality was found in the central nervous system. The only other clinical finding was several small nodules up to $^{1}/_{4}$ in. in diameter on the dorsum of both feet.

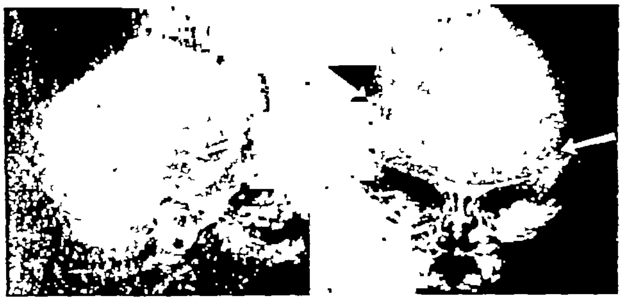


Fig. 2—Radiograms of skull, showing multiple intracerebral areas of calcification.

Radiography of the skull showed appreciable thinning of the bones of the calvarium; in the cerebrum there were small focal areas of calcification and one curvilinear streak (fig. 2). Radiography of the rest of the skeleton and of the chest showed no abnormality.

Blood-count showed red cells 5,200,000 per c.mm., Hb 84% (Haldane), colour-index 0·8, white cells 26,400 per c.mm., neutrophils 34%, lymphocytes 61%, monocytes 5%.

Cerebrospinal Fluid.—Repeated attempts to obtain fluid by lumbar puncture were unsuccessful, so a ventricular tap was performed; the fluid obtained was not xanthochromic; it contained 4 lymphocytes per c.mm., protein 80 mg., chlorides 702 mg., and sugar 57 mg. per 100 ml., Wasserman reaction negative. Pandy's test showed a well-marked increase in globulin. No organisms were seen or cultured.

Blood Tests.—The Wasserman reaction and Kahn test were negative in the infant and in both parents.

Antibody Neutralisation Test.—This was done for us by Dr. Sven Gard, of the Statens Bakteriologiska Laboratorium, Stockholm. The mother's serum showed a positive neutralising capacity of 25 skin-reactive doses, whereas that of the infant gave a weak or dubious positive reaction.

Biopsy of a nodule from the foot showed overgrowth of sweat glands and reactive fibrosis; no protozoa were seen.

Animal inoculation of gastric washings, blood, and C.S.F. did not reproduce the disease.

Progress.—Since the infant's admission to hospital there seems to have been no further progress of the disease. The head circumference remains at $18^{1}/_{2}$ in., and the sutures seem to be closing. There have been several recurrences of the respiratory infection, all of which have responded readily to 'Sulphamezathine.'

DISCUSSION

Since this is apparently the first case to be described in England, it is well to point out that there is no reason why cases should not occur here. Infection of the squirrel with toxoplasma was reported in Britain by Coles (1914) and of the snake, fruit-pigeon, and pied bush chat in the London Zoo by Plimmer (1916). Infection of domestic animals in this country has not hitherto been recognised, but a dog in this area of Kent has recently had toxoplasmic encephalitis, proved by identification of the protozoon (D. M. Heeley, private communication). It is worth noting that our patient's home was previously used by a veterinary surgeon, though we have no evidence that this has any bearing on the child's infection.

The diagnosis in our case has not been proved by isolation of the protozoon, but in view of the clinical findings in the infant and the presence of neutralising antibodies in the mother's serum there seems little doubt about the diagnosis. We have tried to isolate the organisms from the blood, C.S.F., and stomach washings, so far without success, but further efforts are being made, including a muscle biopsy. Failure to identify the organisms in no way disproves the diagnosis.

The negative serological reaction of the infant and the positive reaction of the mother are in keeping with the diagnosis. Sven Gard (private communication) informs us that this type of result is common at this early age. Syverton and Slavin (1946) found, in an adult patient, that antibodies were absent from the serum seven weeks after the onset of the illness. Sabin's views on these unusual results are that they are due either to an immunologically different strain of toxoplasma or to the disappearance of the neutralising antibodies from the blood. He favours the latter explanation, since he found that monkeys lost their antibodies six weeks after the onset of the illness. We suggest that young infants may not have had time to develop neutralising antibodies.

This infant had repeated respiratory infections, and Callahan et al. (1946) found that these were comparatively common among the recorded cases. We have no evidence that the respiratory symptoms are directly due to the toxoplasma. We have made one interesting observation as an indirect result of the treatment of the respiratory infections with sulphonamides. When we first saw the child, his head circumference was 17½ in. and his fontanelles were bulging. Within a fortnight the circumference increased by 1½ in., requiring a ventricular tap to relieve the pressure. The head circumference was thus reduced to 18 in., and during the next four months, in which repeated sulphonamide therapy was used, it increased only ¼ in. No direct claim can be made that this halting of the progress is due to sulphonamides, but Sabin and Warren (1942) have shown that sulphapyridine and sulphathiazole, though having no effect in vitro, have a therapeutic and curative effect in mice and rabbits. Weinman and Berne (1944) state that sulphonamides may cure the acute phase of the disease but do not eradicate the organisms. Robinson (1947) apparently cured a case with sulphathiazole and emetine. Penicillin has been tried (Augustine et al. 1944) and found ineffective.

Though human toxoplasmosis has been recognised only since 1939, increasing numbers of cases are being reported in various parts of the world, and the disease may well be commoner in England than is supposed. For example, cases of chorioretinitis which in the past have been called congenital may well be due to toxoplasmosis. The diagnosis might also be considered in obscure cases of encephalitis and chronic meningitis. Unfortunately there are in England at present no facilities for performing the antibody neutralising test, and in our opinion the provision of such facilities is essential.

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RELAPSE OF PERNICIOUS ANÆMIA
DURING MAINTENANCE THERAPY WITH FOLIC ACID

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RECENT work has clarified the value and limitat of folic acid (synthetic pteroyl-glutamic acid) in t treatment of addisonian pernicious anæmia.

The initial hæmatological and clinical improvement comparable with that obtained with the best liver (Spies 1947, Davidson and Girdwood 1947), though t rate of regeneration of red cells may be slightly slower w folic acid (Frommeyer and Spies 1947). Meyer (19 and others have claimed that the reticulocyte resp less, and the red-cell and final hæmoglobin levels are low with folic acid, but most writers, including Vilter et (1947) and Heinle et al. (1947a), consider the le reached with either liver or folic acid to be similar.

The neurological manifestations of pernicious anæ are not prevented or controlled by folic acid (Davids and Girdwood 1947, Meyer 1947, Vilter et al. 19 Wilkinson 1948), and evidence is accumulating that incidence of subacute combined degeneration of the c may be increased among patients so treated (Heinle Welch 1947, Davidson and Girdwood 1948, Ross et 1948, Wagley 1948). These disturbances tend to a early in treatment, often after the blood picture become normal.

The danger of the development of subacute combi degeneration of the cord in patients treated with f acid makes it unlikely that many long-term studies be made of its ability to maintain the hæmatologi remissions it produces. Reports suggest that, with r exceptions, most patients may be kept in adequ remission on a daily dose of folic acid 10 mg. by mou (Heinle et al. 1947a, Vilter et al. 1947).

The following history of a patient with typical ad sonian anæmia who relapsed under treatment with fol acid despite increasing dosage is thus distinctly unusu

CASE-RECORD

The initial response of this patient to folic acid has be described by Harrison and White (1946). Their report may briefly summarised.

A man, aged 63, was admitted to Hammersmith Hospi on June 4, 1946, diagnosed as a typical case of pernicio anæmia, in his first relapse. He was given by mouth a tot of 200 mg. folic acid, in three separate courses of 100, and 50 mg. A transfusion of 500 ml. of packed red cells w given at the start of treatment.

His initial blood picture was: red cells 840,000 per c.mm P.C.V. 9·2 ml. per 100 ml., M.C.V. 135 c.μ, Hb 3·1 g. per 100 m M.C.H.C. 36%, colour-index 1·2, white cells 2000 per c.mm.

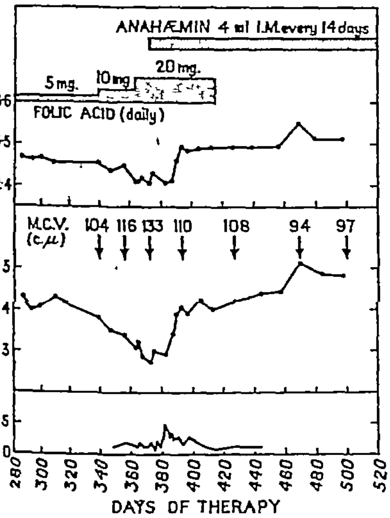
Seventy days after the above-mentioned treatment t blood picture was: red cells 4,200,000 per c.mm., Hb 13·3 per 100 ml., colour-index 1·01, white cells 6000 per c.mm The patient was then put on a maintenance dose of folic ac 10 mg. by mouth twice weekly.

Subsequent History.—This is summarised in the accom panying table and figure. The table shows that, on folic aci 10 mg. by mouth twice a week, his red-cell count average 4,500,000 per c.mm. When the dose was reduced to 5 m twice a week, the count fell and was not restored by increasin the dose to 5 mg. thrice weekly. The patient's blood pictu and clinical condition, however, rapidly improved on 5 m daily, and he remained in excellent health for about fou months.

At the end of this period his red-cell count began to fall No reason for this could be found by clinical examination, an an increase in folic acid to 10 mg. a day did not halt the fall This dose was continued for twenty-three days. Sternal marrow puncture then showed a reversion to megaloblastic erythropoiesis, and by this time the patient was complaining of anxiety, depression, and fatigue. Physical examinatio was still negative. The dose of folic acid was then further increased to 20 mg. a day, but no reticulocyte response followed. The red-cell count continued to fall, and the clinical condition remained unchanged. Eleven days later 'Anahæmin' was given intramuscularly in addition to the folic acid by mouth. There was a reticulocyte response with a peak of 5·5% eight days after the injection of the anahæmin. This was associated with a rapid rise in red-cell and hæmoglobin levels.

The patient continued to receive folic acid 20 mg. daily and anahæmin 4 ml. intramuscularly fortnightly for six weeks. The folic acid was then stopped. The improvement in the blood picture continued, and the patient has since been maintained for nine months on anahæmin alone (now 2 ml. every fourteen days).

At no time during treatment with folic acid did the patient show signs of subacute combined degeneration of the cord.



Response of pernicious anæmia to maintenance therapy with folic acid.

DISCUSSION

Two features of this case deserve comment. The average levels of red cells and hæmoglobin during the period of successful folic-acid therapy were slightly lower than those reached later on liver therapy. The amount of folic acid required to induce the initial remission was small, and the patient was kept in excellent health for eight and a half months on the maintenance doses given. However, it is possible that, if larger maintenance doses had been given, the red-cell and hæmoglobin levels would have reached those attained with liver extract.

Of greater interest is the fall in red-cell count which began after the patient had been receiving folic acid 5 mg. daily for about four months. This trend could not be reversed by a fourfold increase in the dose of folic acid. Larger doses might possibly have been effective but it did not seem justifiable to withhold liver extract any longer.

Very few cases of increasing insensitivity to oral folic acid have been described. Vilter et al. (1947) described two cases in which increasing doses of folic acid were needed to maintain the patients in remission. The patients did, however, respond to the increased dose. Wilkinson (1948) describes similar cases. Hansen-Pruss (1947) gives histories of two cases very similar to that of the patient now reported. One of his patients whose initial red-cell count was 1,200,000 per c.mm. responded to a daily dose of folic acid 20–30 mg. by mouth; his count reached 3,600,000 per c.mm. in about forty-five days. He was kept in fair remission for two or three months on 10 mg. daily, but his red-cell count subsequently fell, and an increase of folic acid to 30 mg. daily did not halt this relapse. The other patient responded well to a similar initial dose of folic acid, and his red-cell count reached 4,500,000 per c.mm. in about eight weeks. He also was kept in remission for about four months on 5–10 mg. daily but relapsed at the end of this period. Again this deterioration was not arrested by increasing the dosage of folic acid to 45 mg. by mouth daily. Both cases responded satisfactorily to liver extract afterwards.

The exact function of folic acid in the pathogenesis of pernicious anæmia is still obscure. The work of Welch et al. (1946) and of Bethell et al. (1947) suggested that the primary defect in pernicious anæmia might be an inability to liberate free folic acid from conjugated forms, and that liver extract given parenterally corrected this abnormality. The evidence to date does not justify complete acceptance of this attractive hypothesis. Heinle et al. (1947b), in fact, consider that the more recent experimental evidence does not support the idea of a direct relationship between folic acid and the anti-pernicious-anæmia principle of liver. They suggest that these two substances may function by unrelated pathways.

RESPONSE OF PERNICIOUS ANÆMIA TO MAINTENANCE THERAPY WITH FOLIC ACID

Days of therapy	Therapy	Total folic acid per week (mg.)	Duration of therapy (days)	No. of blood-counts	Red blood-cells (millions per c.mm.)			Hæmoglobin (g. per 100 ml.)		
					Average	Range	Final count of period	Average	Range	Final value of period
71–126	Folic acid 10 mg. by mouth twice weekly	20	55	20	4·5	4·2–5 0	4·5	13·9	12·5 to 15·3	13·7
127–150	Folic acid 5 mg. by mouth twice weekly	10	23	7	4·3	3 9–4·5	4·2	12·8	12·2 to 13·6	12·2
151–178	Folic acid 5 mg. by mouth three times a week	15	28	5	3·8	3·5–4·0	4·0	13·0	11·5 to 13 9	13·9
180–214	Folic acid 20 mg. by mouth twice weekly	40	34	9	4·2	3·5–4·8	4·0	13·7	13·1 to 15·0	14·4
215–339	Folic acid 5 mg. by mouth daily	35	124	13	4·2	3·9–4·9	3·8	14·3	13·1 to 15·0	14·5
340–363*	Folic acid 10 mg. by mouth daily	70	23	4	3·4	3·8–3·0	3·0	13·7	13·3 to 14·0	13 3
364–375*	Folic acid 20 mg. by mouth daily	140	11	3	2 9	3·2–2·7	2·7	13·0	12·9 to 13·2	13·0
376–416*	Folic acid 20 mg. by mouth daily and anahæmin 4 ml. fortnightly	140	40	8	3·7	3 0–4·3	4·0	14·5	12·8 to 15·5	15·5
417–532	Anahæmin 4 ml. fortnightly	..	115	7	4·9	4·2–5·4	5·2	16·3	15·4 to 17·5	16 2
533–662	Anahæmin 2 ml. fortnightly	..	130	8	4·6	4·2–4·9	4·9	16·4	14·8 to 17·5	17·0

* The detailed results for this period are shown in the figure.

Case-records such as that reported here and those described by Hanson-Pruss (1947), and the instances of almost complete insensitivity to folic acid in patients with apparently typical pernicious anæmia in relapse mentioned by Heinle et al. (1947a), further underline the complexity of the relationship between addisonian anæmia, folic acid, and the liver principle.

SUMMARY

Details are given of a patient with addisonian pernicious anæmia, who, after a good initial response, relapsed ten months later while still under treatment with folic acid.

He did not respond to a fourfold increase in the dosage of folic acid but responded well to anahæmin.

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HYPERDURIC PREMEDICATION

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PREMEDICATION is now considered essential to any operation, but the main difficulty is to estimate the correct time for the injection to be given. Often an apparently long case is started, found to be inoperable, and terminated, and consequently the premedication of the following case cannot be given at the ideal time—i.e., 45–75 min. before operation.

Messrs. Allen & Hanburys Ltd. have introduced a salt of morphine and atropine which is more slowly absorbed than the tartrate or the sulphate. We have investigated this product, which is called "Hyperduric Morphine and Atropine" and consists of a mixture of the mucates of morphine and atropine.

Mucic acid is a dibasic hydroxy-acid which may be regarded as a homologue of tartaric acid; it bears the same relationship to adipic acid as tartaric acid does to succinic acid:

$$\begin{array}{c}\text{CH}_2\text{COOH}\\ | \\ \text{CH}_2\text{COOH}\end{array} \qquad \begin{array}{c}\text{CH.OH COOH}\\ | \\ \text{CH.OH COOH}\end{array}$$

Succinic acid Tartaric acid

$$\begin{array}{c}\text{CH}_2\ \text{CH}_2\ \text{COOH}\\ | \\ \text{CH}_2\ \text{CH}_2\ \text{COOH}\end{array} \qquad \begin{array}{c}\text{CH.OHCH.OH COOH}\\ | \\ \text{CH.OHCH.OH COOH}\end{array}$$

Adipic acid Mucic acid

Toxicity.—The toxicity of mucic acid is low, and though it has no peculiar pharmacological action of its own it prolongs the action of bases with which it is combined.

Baumgarten (1906) reported the administration of 50 g. of mucic acid by mouth to a patient without any observable ill-effects. Rose and Jackson (1926) found that massive doses of 5–10 g. by mouth occasionally produced nephritis in fasting rabbits. A statement was made by Lumière (1925) that sodium mucate acted as an anticoagulant at a concentration of 0·4% and was completely non-toxic.

C. J. Eastland (personal communication) has found that in rats the L.D. 50 for subcutaneous injection of mucic acid in the form of its triethanolamine compound is 3 g. per kg. of body-weight. With regard to the L.D. 50 by the intravenous route, the largest permissible volume of the solution (0·25 ml. per 10 g. of body-weight) led to no deaths. This corresponds to a dose of mucic acid, in the form of its triethanolamine compound, of 0·75 g. per kg. of body-weight.

H. O. J. Collier (personal communication) has further determined by the method of Miller and Tainter (1944) the acute toxicity in mice by subcutaneous injection of a suspension of sodium mucate in water, and of solutions of sodium tartrate and sodium citrate. He found that the acute L.D. 50 of sodium mucate was equivalent to 1·47 ± 0·17 g. of mucic acid per kg. of body-weight; of sodium tartrate was equivalent to 5·97 ± 0·32 g. of tartaric acid per kg. of body-weight; and of sodium citrate was equivalent to 3·715 ± 0·18 g. of citric acid per kg. of body-weight.

Since injection solutions of mucic-acid compounds do not contain more than 0·025 g. per ml., it seems reasonable to describe the injection as non-toxic.

Prolongation of the action of bases with which mucic acid is combined was first noted in this country during the early stages of the late war after many different compounds of morphine had been examined in a search for one which would have a more sustained action and therefore be of particular value for air-raid and Service wounded (Eastland 1944).

Subsequently it was found that Régnier (1938) had called attention to the variations in activity of any given base according to the acid combined with it. Later, when the liberation of France rendered correspondence possible, Professor Régnier stated, in a private communication made in 1945 to C. J. Eastland, that using narcotic bases he had studied the effect of the formation of salts with two types of acid, such as phenyl-propionic and phenyl-butyric acids on the one hand and gluconic and mucic acids on the other. Salts formed with the first group of acids he described as "sels rapides"—i.e., salts having an immediate and more profound action—and compounds formed with the second type of acids he termed "sels lents"—i.e., those developing the specific activity of their base slowly.

More recently Régnier (1946) described the prolongation of morphine narcosis when the base was used clinically in the form of mucate.

Our first investigation was with morphine mucate gr. $^1/_4$ and atropine mucate gr. $^1/_{150}$, but we found that, though this dosage was ideal in most respects, in some cases, when irritant drugs—e.g., ether—were used, an excess amount of mucus was produced. We therefore increased the amount of atropine mucate from gr. $^1/_{150}$ to gr. $^1/_{75}$ and have found that now the drying of secretions is excellent.

We have used the mucates of morphine and atropine in 1380 cases—480 with atropine gr. $^1/_{150}$ and 900 with atropine gr. $^1/_{75}$, both combined with morphine gr. $^1/_4$.

RESULTS

Drug action started in about $^1/_2$ hour, reached its peak in about $1^1/_2$ hours, and lasted up to 8 or more hours. This is an advantage in that the action of atropine sulphate usually starts to abate in about 45–60 min., with the result that, if for any reason an operation is delayed, a further injection of atropine is necessary. In our series with hyperduric morphine and atropine no second injection of atropine was required. When using the mucate salts we have been in the habit of giving all the premedications at 8.30 A.M. for operation lists which start at 9.30 A.M. and extend to 4.30–5 P.M. The nursing staff state that this has effected a great saving of time, since all premedications for the day can be given during what is a relatively quiet period, without constantly interrupting the ward routine.

Drying of secretions is excellent with the combination containing atropine gr. $^1/_{75}$, but not too viscid and equal in effect to scopolamine gr. $^1/_{150}$. Bronchoscopy was done on three thoraco-abdominal resections of stomach 3–6 hours after premedication, and no excess mucus was found, the small amount present being non-viscid.

Sedation was satisfactory, but very few patients had complete amnesia.

Respiratory depression was not pronounced and was certainly less than after morphine sulphate gr. $^1/_6$.

Postoperative sedation was excellent. Most patients, including abdominals and thoracics, required no postoperative morphine for 8–30 hours after premedication. A few patients of exceptional muscular build required postoperative morphine about 6 hours after premedication. Patients of normal physique, aged 16–60, usually did not require any postoperative morphine until about 8–12 hours after premedication; they were not drowsy or depressed, and many sat up in bed and read the evening papers. Those of frail physique and at the extremes of age required postoperative morphine much later, about 15–20 hours after premedication. They were sleepy but not depressed and could talk coherently during our evening visit. Finally, those of very frail physique required postoperative morphine about 24–30 hours after premedication; these were very sleepy but were easily aroused and not depressed. All postoperative morphine was given as sulphate not mucate. The surgical ward sisters are unanimous that postoperative morphine is required much later after premedication with hyperduric morphine and atropine than after any other type of premedication, and that the patients were less restless on regaining consciousness and were in no way depressed. We feel that this tends to decrease postoperative chest trouble in that, with an early return to consciousness and coöperativeness, a minimum of respiratory depression, and an absence of pain, the patients will do their breathing-exercises and thus ventilate their lungs.

Age Limits.—The patients were aged 11–82 years. Every patient in this series received hyperduric morphine gr. $^1/_4$ and atropine gr. $^1/_{75}$ or $^1/_{150}$ to determine whether there was any undue depression or untold side-effect. We noted that those in the extremes of age and in poor or frail physique were more influenced but not unduly depressed. The age-distribution was as follows:

Percentage age-distribution

Age (years)	11–16	16–40	40–60	Over 60
Male	2·0	22·3	30·8	9·1
Female	1·5	12·1	17·4	4·8
Total	3·5	34·4	48·2	13·9

Vomiting was minimal. Many non-abdominal patients within an hour of waking were eating a small lunch with no residual nausea or vomiting. All these patients had been anæsthetised with drugs of minimal toxicity and maintained in the lightest possible plane of anæsthesia with regard to the requirements of the operation, and most had gained their reflexes before they left the theatre. This must have explained in part the almost complete lack of vomiting noted by the nurses and ourselves.

Hypersensitivity.—One case of hypersensitivity was noted. An apprehensive man, aged 23, started vomiting $^1/_2$ hour after the injection and vomited five times in the next 3 hours. He gave no history of sensitivity to morphine, and a postoperative dose of morphine gr. $^1/_4$ caused no further vomiting. We considered this vomiting to be psychogenic.

Anæsthetic Agents.—All the patients had a thiopentone induction, followed either by nitrous oxide and oxygen with 'Trilene' or ether added as necessary, or by cyclopropane. Relaxation in all abdominal cases was obtained with 'Tubarine.'

SUMMARY

The mucates possess advantages over other salts of morphine and atropine, the greatest asset being a very much slower rate of absorption and hence the resulting action is much prolonged. This longer action, especially with atropine, makes it an ideal premedication for patient, anæsthetist, and nurses.

We wish to thank Messrs. Allen & Hanburys Ltd. and particularly Dr. G. R. Boyes, of their medical department, and Mr. C. J. Eastland, of their research department, for supplying most of the drugs with which this investigation was done and for their technical advice.

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Reviews of Books

Clinical Diagnostic Methods

or The Examination of Patients. C. G. LAMBIE, M.D., F.R.C.P.E., professor of medicine, University of Sydney; J. E. ARMITAGE, M.B., M.R.C.P., demonstrator in clinical laboratory medicine in the university. Sydney: Grahame Book Co. 1947. Vol. I. 1948. Vol. II. Pp. 1138.

THESE two volumes, written for the senior student and hospital resident as well as for the beginner, cover in about 1000 pages the bedside methods of examination and all those laboratory and specialist examinations which may fairly be regarded as part of clinical diagnosis. A new book on this subject ought either to present the groundwork of clinical medicine in a fresh and original way or to combine comprehensively in one textbook what is usually scattered in several. These objects are partly, though not wholly, attained here. For the way in which precise practical details of different examinations are given the book deserves nothing but praise. Such procedures as percussion and auscultation, as well as such techniques as lumbar puncture, are very well described, and excellent photographs (some helpful, some redundant) accompany the text. On the other hand the student who is given a good account of radiography and several pages on electro-encephalograms may feel a need for more than one page and one diagram on electrocardiography, and would probably like to have some account of actual methods of measuring the basal metabolic rate. The authors did not intend to deal with elaborate specialised techniques and no doubt found it difficult to draw the line. Their teaching is thoroughly sound, and the book deserves success.

Hormones and Behaviour

A Survey of Interrelationships Between Endocrine Secretions and Patterns of Overt Response. FRANK A. BEACH, professor of psychology, Yale University. New York: Paul B. Hoeber. London: Hamish Hamilton Medical Books. 1948. Pp. 368. 32*s.* 6*d.*

THE manuscript for this publication was written while the author was chairman of the department of animal behaviour at the American Museum of Natural History in New York. He intended to present a summary of the existing knowledge of hormones and behaviour as a useful aid for workers in this field. Although he describes the book as a "compendium of what others have done and concluded" it is much enriched by the results of his ten years' experimental work on behaviour in animals. The material is arranged arbitrarily in general categories, such as courtship and mating, migration, generalised aggression, emotion, conditioning and types of learning, developmental aspects, the rôle of nervous stimulation, and interpretations of hormonal effects. Naturally enough, sexual behaviour gets much attention, partly because it is here that the effects of hormone action are particularly evident and specific. Though the book is meant as a work of reference, and "the final responsibility of ascertaining the reliability of any data cited therein is left to the reader," every section contains information of absorbing interest. Thus it seems that German shepherd and saluki dogs have highly active thyroids and excitable natures, but that thyroidectomy reduces their alertness (p. 111); while female rats, according to one observer, are less timid than males, and castration has no influence on this difference. The emotions of women are strongly affected by gonadal hormones, and characteristic psychic changes have been noted during menstruation: thus "girls who were learning to walk a tight-wire showed a deceleration of the learning curve during menstrual periods." Male puppies, if injected with androgen, lift one hind-leg during micturition at 8 weeks, in contrast to the normal dogs, which do it at 19 weeks, and dogs castrated as puppies, which never do it at all. From a study of the hormonal control of learning, and of sexual and maternal behaviour, Professor Beach is led to believe that "the affinity of particular mechanisms for given hormones has resulted from a long, slow process of evolutionary development"; which few will be disposed to dispute. The very full glossary will be appreciated by those who do not know that *Bufo cognatus* is a Great Plains toad, or *Dolichonyx oryzivorus* a bobolink.

Radiotherapy and Cancer

A. G. C. TAYLOR, M.R.C.S., F.F.R., chief radiotherapist Wessex Radiotherapy Board; JOAN LASSETTER, M.B., D.R., and T. K. MORGAN, M.B., D.M.R.T., radiotherapists of the board. London: H. K. Lewis. 1948. Pp. 81. 7*s.* 6*d.*

THIS little book is the result of work by a team of radiotherapists in the area which includes the Royal South Hants and Southampton Hospital and the Royal Victoria and West Hants Hospital, Bournemouth. The classification of malignant disease which they have agreed to use is set out and their views are given on the methods of treatment likely to be most effective. The book is designed for the medical and surgical staff of the hospitals which they visit, and the general practitioners whose patients they treat, but it will also prove a useful quick-reference work for many people interested in radiotherapy. Not all will agree with the terms used, and some will prefer other methods of treatment; but the book is generally sound and shows that a high standard of treatment is being maintained.

Soviet Biology

T. D. LYSENKO. *A Report to the Lenin Academy of Agricultural Sciences, Moscow.* London: Birch Books 1948. Pp. 51. 2*s.* 6*d.*

THE controversy between two schools of genetics in the U.S.S.R. has been followed with interest and emotion by biologists and others in many parts of the world. Those who wish to find out exactly what Acadamician Lysenko has to say on behalf of one school will be grateful to the translators of his recent official report. The type of biological thinking he advocates is forcefully expounded. Darwinism is said to have been debased by the teachings of Weisman, Mendel, and Morgan; because (among other things) "one of the greatest acquisitions in the history of biological science," the principle of the inheritance of acquired characters, has been thrown overboard. That heredity is determined not specifically by the chromosomes but by the metabolism of the whole body is claimed to have been demonstrated by the study of vegetative hybrids, produced by grafting according to methods elaborated by Michurin. Detailed descriptions of these experiments are not easily available, and their validity has been disputed by many Russian biologists of high repute. Consequently, Lysenko says, Morganism-Mendelism has been taught in most Soviet universities and colleges, while the Michurin trend in science has not been taught at all and "remains in the shade."

As a further argument against Mendelism, Lysenko points to the uselessness to the practical farmer of experiments in drosophila genetics, such as those carried out intensively by Dubinin. Similar objections could, of course, be raised against other erudite types of scientific inquiry, which are unlikely to be of immediate value in the advancement of social welfare or medicine. It is difficult for students of genetics, who have been schooled to regard the attractive hypothesis of inheritance of acquired characters as very improbable, to appreciate Lysenko's enthusiastic advocacy. Careful reading of the report, however, suggests that he sincerely believes that this assumption is essential for the most rapid and efficient development of agriculture.

Epithelia of Woman's Reproductive Organs

GEORGE N. PAPANICOLAOU, M.D., PH.D., professor of clinical anatomy, Cornell University; HERBERT F. TRAUT, M.D., professor of obstetrics and gynecology, University of California; ANDREW A. MARCHETTI, M.D., associate professor of obstetrics and gynecology, Cornell University. New York: Commonwealth Fund. London: Oxford University Press. 1948. Pp. 53. 55*s.*

THE investigation over thirty years ago of the œstrus cycle in the guineapig by Stockard and Papanicolaou laid the foundations for the bio-assay of œstrogens. Since then Papanicolaou has continued to study cytology in relation to sex physiology, and between 1939 and 1943 he joined with Traut in working out the diagnosis of uterine carcinoma by vaginal smears. Since then, these two authors have been joined by Marchetti in a histological study of the normal cyclical changes of the female reproductive epithelia.

The chapters on the graafian follicle and corpus luteum, the tubal mucosa, and the endometrium follow the generally accepted descriptions. There are some advances in the account of the cyclical changes in the endocervical glands. The longest section (6 pages) deals with the alterations in the epithelium of the vagina and the outer surface of the cervix. These are discussed under the headings of the two epithelial types, the glycogenic and the keratinised, and the changes are correlated with those in the vaginal smear. This section is of most interest because of its relation to the new diagnostic methods in carcinoma.

The authors offer an interpretation of the histological appearances in relation to function. The tubal epithelium reaches its fullest development at the time the ovum is discharged and passes down the tube. The endometrium reaches its peak of activity at 7–10 days after ovulation, and then degenerates if nidation has not occurred. The endocervical glands show their most characteristic changes shortly before ovulation, which is the time at which intercourse is most likely to be followed by conception. Similarly the vaginal epithelium has its greatest proliferative activity during the follicular phase, and regresses after ovulation.

Apart from the section on the vaginal epithelium, the book does not offer much new knowledge, and as a work of reference in the special field it carries us little further than the standard textbooks. It is well illustrated with 23 coloured plates, which presumably account for the high price.

A New Theory of Human Evolution

Sir ARTHUR KEITH. London: Watts. 1948. Pp. 451. 21*s.*

Sir Arthur finished this book on his 81st birthday, but his readers will hope that the theme will be further developed, especially in the light of recent discovery. While concurring with Darwinian theories, at least to the point of agreeing that the human stem sprang from a simian root, he propounds a "group theory" which stresses the importance in evolution of small isolated groups each with its own particular genes; for "we are linked with our simian ancestry by a continuous trail of gene-containing germ plasm." This theory is worked out by a mass of argument supported by a tremendous bibliography. Later chapters are devoted to nationalism and racialism as factors in human evolution, and review the cases of Egypt, Wales, South Africa, Scotland, the Irish Free State, and the Jews. The lucidity of the writing helps to sustain interest both in the innumerable facts presented and in the explanations offered.

THE LANCET

LONDON: SATURDAY, DEC. 11, 1948

Attack By Virus

MUCH is now known about viruses, but less about the way in which they cause diseases. In the acute exanthems, for instance, it has been usual to recognise an incubation period and a period of invasion; but we do not know what is happening behind the scenes during these phases. Following the precedent of investigations of bacterial diseases, it should be useful to detect the virus, and measure its amount in various organs at different stages of the illness; and at the front of this issue Dr. FENNER describes such a study of the virus infection known as ectromelia or mousepox. This disease of mice is apparently the biological equivalent of vaccinia and variola, resembling vaccinia in its incubation period, its primary lesion at the site of infection, and its generalised rash at a later date. The virus has serological affinity with those of vaccinia and variola, and its attack on the cell is made manifest by an acute necrosis of cells in viscera such as the liver and spleen and by brilliant eosinophil intracytoplasmic inclusions in the skin. For these and other technical reasons mousepox seems an ideal "model" on which to study the mechanism of virus infection, in the hope of throwing light on the processes at work in the virus exanthems of man.

Mousepox is spread by contact, and the virus enters the body through minute abrasions of the skin. After an incubation period of about 7 days a local lesion appears at the site of entry, and within 2 more days an acute fatal necrosis may develop in the liver and spleen, or else a widespread papular rash breaks out on the skin. FENNER shows that the virus passes rapidly from the portal of entry to regional lymph-glands and thence to the blood-stream, from which it is removed by the liver and spleen. Virus proliferation then proceeds actively in the liver and spleen, and from the 5th to the 12th day the virus is present in the blood as a result of continued liberation from necrotic cells in these organs. The skin first shows virus on the 6th day after infection, and from then onwards its virus content rises rapidly to a maximum at the time when the rash appears on the 9th day. *Pari passu* with the appearance and rise in titre of antibodies in the circulation from the 10th day onwards, the amount of virus in all the organs rapidly decreases though virus is still to be found in the skin up to about the 16th day. This course of events bears little resemblance to the classical concept of the infective process, for it consists essentially in a period of initial invasion followed by multiplication of the virus in internal viscera during the incubation period. The rash is clearly the result of focal infection of the epidermal cells, and this is caused by the secondary viræmia initiated by necrosis in the liver and spleen. Clinical phenomena lag behind the multiplication of virus, and symptoms do not appear until after virus proliferation has reached its peak, when the battle may be already lost. The incubation period is thu revealed as the most vital of all the phases of th disease. Focal infection of the skin, causing a rash is seen in cases where the internal attack has bee less fierce, and it is the means whereby the virus shed from the body to seek fresh hosts. The prolonge viræmia is doubtless responsible for effective stimulation of the antibody mechanism and may therefor be the reason for the staunch immunity which follow such a disease.

Passing from experimentally verifiable facts t deduction, FENNER postulates a similar mechanism in other acute exanthematic diseases. He notes th similarity of the process outlined to that described by ØRSKOV in mouse typhoid and by ØRSKOV and ANDERSEN in experimental vaccinia in the rabbit Smallpox differs from both mousepox and vaccinia in having no apparent primary lesion, though thi may be present in the respiratory tract; but the skin lesions of variola are known to be associated with viru multiplication, and thus the rash at least resemble that of mousepox. The evidence concerning varicella i much more tenuous, though virus has been demonstrated in the skin lesions. In variola, varicella, and measles the incubation period is shortened if the infection is conveyed by direct inoculation, and in measles the blood is well known to be infective during the incubation period. The shortness of the incubation period in dengue is attributed by FENNER to early viræmia following intravenous inoculation of the virus by the mosquito. To his list of other diseases in which the mechanism of infection may be similar we may perhaps add typhus fever, in which the demonstration of rickettsiæ in the skin has been utilised for diagnosis.[1] The primary lesion and secondary rash of such diseases as scrub-typhus and fièvre boutonneuse also suggest that FENNER's observations may apply to rickettsial infections. In whatever direction they ultimately prove to be applicable they are bound to affect our endeavours in prevention and treatment. In measles, for example, if viræmia precedes the rash and causes widespread infection of cells during the incubation period, anti-measles serum cannot be expected to prevent the disease completely unless given soon after infection. The question arises whether this new concept of virus infection reduces the prospect of successful chemotherapy. All that can be said at present is that theoretically the most effective time for therapy would be that which precedes the onset of symptoms; for once these are present, it can do no more than limit the viræmia and thus diminish continued infection of new cells. Happily the results now being obtained with chloromycetin in the treatment of scrub-typhus[2] suggest that such an effect will be worth having.

Meanwhile readers who find difficulty in visualising the intimate processes of the virus infection of individual cells would do well to study the remarkable pictures obtained by the latest technique of electron-microscopy using "shadowed" objects. Photographs of bacterial cells crumbling into masses of bacteriophage particles,[3] and tadpole-like bacteriophage

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1. Mandelbaum, H., Hollander, G. *Amer. J. Med.* 1947, 3, 315.
2. Smadel, J. E., Woodward, T. E., Ley, H. L. jun., Philip, C. B., Traub, R., Lewthwaite, R., Savoor, S. R. *Science*, 1948, 108, 160; see *Lancet*, 1948, i, 953.
3. Edwards, O. F., Wyckoff, R. W. G. *Proc. Soc. exp. Biol., N.Y.* 1947, 64, 16.

elements swarming to the attack on bacteria,[4] give a vivid idea of the kind of battle between cell and virus that is going on inside our patients.

Towards Better Statistics

THE International List of Causes of Death, whose object is to secure comparability between the vital statistics of the different countries in the world, has to be revised every ten years to keep pace with advancing knowledge. At the last revision—the sixth—a major advance was made by including the causes not only of death but also of non-fatal diseases, minor ailments, and injuries. With the aid of the International Manual, accepted by the World Health Organisation and now being printed at Geneva in three languages, morbidity statistics can in future be tabulated and presented much more uniformly than has hitherto been customary or possible. In much of the heavy preliminary work involved in this achievement Dr. PERCY STOCKS, chief medical statistician of the General Register Office, played a major part. In the later stages, however, the Minister of Health appointed a special committee, with Sir ERNEST ROCK CARLING as chairman, to study the proposed list and to recommend amendments or additions. The critical examination of some thousand groups of causes of sickness or death was no light task, and it had to be carried out relatively quickly. Now that the detailed and lengthy list has been compiled, there would obviously be advantages in keeping such a body of experts in being, to observe the imperfections in the list that are bound to become apparent, the changes that advancing knowledge will require, and the extensions that research makes advisable. When the seventh revision falls due in another ten years' time we should then be well prepared.

This idea has led the Registrar-General to appoint an Advisory Committee on Medical Nomenclature and Statistics, whose members are named on p. 944; but it will be seen that the committee is not to restrict its activities to the International List, or even to nomenclature in general, but *is also asked to assist* the General Register Office in any matters concerning medical statistics that may be referred to it. This is an excellent plan. The increasing demands of users of medical statistics are undoubtedly evoking a certain resistance on the part of the producers —the people who fill in the forms. This antithesis between users and producers is of course as false as the antithesis between pedestrians and riders in motor vehicles: we are all both at different times. No doubt most doctors are *mainly* producers; but very few of us are not also consumers of medical statistics in one way or another, and we are annoyed if the particular information that we ourselves want is not available. The very treatment of the patient must, indeed, be based on previous numerical results —namely, the ratio of successes to failures. What often inspires our resistance as producers is the feeling (*a*) that many of the statistics asked for are useless or unnecessary, (*b*) that nothing will be done with them when they have been collected, and (*c*) that the same, or almost the same, information is being asked for by a number of different persons all oblivious of o another's activities. Such feelings too often ha a just, or partially just, foundation; and, thoug the General Register Office has never been an offend in these ways, one of the possible benefits of t Registrar-General's committee is that it may preve waste of effort. Its members have obviously bee chosen for their widely diverse interests—publ health, medicine, surgery, pædiatrics, psychiatr obstetrics and gynæcology, general practice, and on, in addition to the professional statisticians an members of Government departments. It shoul therefore be able to give the Registrar-Gener sound advice over this very wide field: *to say wh and how it would be appropriate for him to ma* some statistical venture; to keep, so far as th General Register Office is concerned, the deman made upon those actively practising medicine withi reasonable bounds and to prevent overlappin demands; *and to ensure that the kind of informatio* that doctors from time to time require from th national registers has in fact been collected, an collected in the best and most informative way.

The need for research on a problem in medicin has *quite often been first revealed by the tabulatio* of statistics—sometimes, indeed, quite crude statistic So long as the practitioner in medicine is satisfie that his returns of sickness and death are in thi way of real value as a stimulus to research and in it *prosecution, and will in the long run contribute t* the advance of medicine, he will not grudge the tim that must be given to accurate diagnosis and to th recording of it. Indeed, it is a sign of the times t find specialists from every main departent of medical practice *accepting an invitation* to deliberate on —statistics

Toxoplasmosis

TOXOPLASMA has been recognised for forty years as a separate genus of protozoa, pathogenic for various animals; but it was not until 1939 that WOLF and his colleagues[1] in New York established that the *organism was a cause of human disease.* The protozoan was first described in 1908, when it was found in a rabbit by SPLENDORE[2] and in the North African gondi by NICOLLE and MANCEAU,[3] who proposed the name toxoplasma. *All the toxoplasmata* since *isolated probably* belong to one species.[4] In smears from affected organs they are usually crescentic, pointed at one end and rounded at the other (*see figure*), and *measure* 4–7 × 2–4 μ. The protoplasm is very delicate, staining pale blue. The nuclear chromatin occupies about a third of the parasite, near the rounded end, and stains red to purple with Giemsa. The organism divides by binary fission. In tissue sections "pseudocysts," *representing aggregates of* parasites in a host cell whose nucleus has disappeared, are sometimes seen

Smear from peritoneal exudate of a mouse infected with toxoplasma, kindly provided by Dr. Albert Sabin. (× 1350)

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[4] Delbrück, M., Delbrück, M. B. *Sci. Amer.* 1948, November,

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4. Sabin, A. B., in Advances in Pediatrics New York, 1942; vol. I.

The human disease takes five forms: (1) a congenital necrotising encephalitis, (2) an acquired encephalitis in older children, (3) an acute toxoplasmosis with maculopapular rash in adults, (4) a chronic encephalitis in adults, and (5) symptomless infection. Of the clinically manifest types the congenital encephalitis is the commonest. The symptoms of this may be present at birth or may develop after a few weeks or months. Hydrocephalus (which may be demonstrable in utero[5]) or occasionally microcephaly, twitching or generalised convulsions, chorioretinitis, and cerebral calcifications are the main features. Jaundice is present in about half the cases and when accompanied by enlargement of the spleen and liver may suggest icterus gravis neonatorum. Splenic enlargement is less frequent than jaundice and is seldom gross. Hæmorrhagic diathesis is present in about a third of cases, and it may dominate the clinical picture and simulate hæmorrhagic disease of the newborn.[6] The chorioretinitis produces progressive blindness and shows itself in irregular white spots with pigmented borders on the retina. The cerebral calcifications are seen as dots or curvilinear shadows in the X-ray film. The blood picture is normal, but in active cases the cerebrospinal fluid shows a moderate or pronounced pleocytosis and often a considerable increase in protein; the fluid may be xanthochromic and this may suggest a spinal block. The infants may survive for several years, but they will be mentally deficient and are likely to be blind. At necropsy the cerebral cortex, pons, and medulla often show multiple opaque whitish or yellowish areas of necrosis, 1–2 cm. in diameter, with calcification and sometimes cysts. These areas contain many compound granule cells, and lymphocytes and polymorphs are also commonly found. Other findings are scattered miliary granulomata, perivascular cuffing, and subependymal granulomata with ulceration of the ependymal lining. Occasionally there is a widespread encephalomalacia, and the brain may even be a "collapsed gelatinous, almost shapeless mass."[7] Malacic changes may be found, more rarely, in the spinal cord. The parasites are usually easily demonstrated in the central nervous system, and they have been reported in the lungs, muscles, kidneys, and elsewhere, with or without any inflammatory reaction.[6–9] Neonatal cases clinically and anatomically resembling toxoplasmosis have been described[10] in which no parasites could be found, and it seems likely that there are other causes of granulomatous or necrotising encephalitis acquired in utero.

The acquired toxoplasmosis of childhood, first described by Sabin,[11] produces vomiting, headache, fever, and convulsions, suggestive of meningitis or encephalitis, and there may be some enlargement of spleen and lymph-glands. Some cases of this group present symptoms of brain tumour.[4] Toxoplasmosis in adults was first reported by Pinkerton and Henderson[12] in South America and very few examples have been published. In acute cases the onset is sudden with rigors, fever, respiratory symptoms, and a maculopapular eruption not unlike the rash of rickettsial infections. The main post-mortem changes are in the lungs—interstitial pneumonia and focal necroses—though foci of necrosis are also found in the heart muscle, and the liver, spleen, and other viscera seem to be more commonly affected than in infantile toxoplasmosis. In the chronic adult form the symptoms are mainly related to the central nervous system, and areas of encephalomalacia surrounded by parasites have been found at necropsy. In one unconfirmed case the patient died of heart-failure, and parasitic "cysts" were found in the myocardial fibres.[13] Lastly there are the symptomless infections, discovered serologically, of which there have been many examples among adults and a few in children.[4] The mothers of babies with congenital toxoplasmosis have of course been infected, and neutralising antibodies can usually be found in their serum, yet they show no signs of disease.

However suggestive are the clinical, ophthalmoscopical, and radiological findings, the diagnosis of toxoplasmosis must rest on the demonstration of parasites and the serological tests. During life toxoplasma has only exceptionally been demonstrated in the cerebrospinal fluid.[11] Post mortem the discovery of parasites in smears and sections, and their propagation in suitable animals, is the decisive finding. Mice should be inoculated intracerebrally with 0·02–0·03 ml. of a tissue suspension or the deposit of centrifuged cerebrospinal fluid: guineapigs with 1–5 ml. intraperitoneally and intramuscularly; and rabbits with 0·2 ml. intracerebrally and 0·1 ml. intracutaneously. Lesions in the inoculated animals must then be examined for parasites. In vivo the most important diagnostic investigation is the test for neutralising antibodies, described by Sabin.[11]

> The brains of infected mice are ground with ten times the amount of Tyrode's solution. From the supernatant fluid dilutions of 1:5, 1:50, and 1:500 are made. The original supernatant fluid and the three dilutions are then mixed with an equal amount of the serum to be tested, or, for controls, with the same amount of Tyrode's solution. The final dilutions are therefore 1:10, 1:100, 1:1000, and 1:10,000. Intracutaneous injections of 0·2 ml. of each serum and control dilution are then made into the depilated back of a rabbit. Reactions usually appear in 5–9 days. The highest dilution with Tyrode's solution which produces a skin lesion is a skin-reactive dose. By comparing the two series of lesions the number of skin-reactive doses (if any) in the serum under test can be estimated.

For this test a strain of toxoplasma continually propagated in suitable animals—usually mice—is required, and unfortunately no such strain exists in Britain. Sending sera abroad for testing is unsatisfactory because the neutralising antibodies often disappear in a few days. Toxoplasma cannot be cultivated on synthetic media, but propagation on minced chick embryo suspended in Tyrode's solution has been successful.[14] and lately MacFarlane and Ruchman[15] have cultivated the organism on the developing chick embryo. The infected membranes could be stored at 4°C for as long as a month, so this technique may make it possible to obtain a strain for continuous propagation in this country.

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[5] Wolf, A., Cowen, D., Paige, B. H. *Science*, 1941, 93, 548.
[6] Callahan, W. P. jun., Russell, W. O., Smith, M. G. *Medicine, Baltimore*, 1946, 25, 343.
[7] Kean, B. H., Grocott, R. G. *J. Amer. med. Ass.* 1948, 136, 104.
[8] Hertig, A. T. *Amer. J. Path.* 1934, 10, 413.
[9] Zuelzer, W. W. *Arch. Path.* 1944, 38, 1.
[10] Parsons, L. G. *J. Obstet. Gynæc.* 1946, 53, 1. Baar, H. S. *Brit. med. Bull.* 1946, 4, 178.
[11] Sabin, A. B. *J. Amer. med. Ass.* 1941, 116, 801.
[12] Pinkerton, H., Henderson, R. G. *Ibid*, p. 807.
[13] Kean, B. H., Grocott, R. G. *Amer. J. Path.* 1945, 21, 467.
[14] Sabin, A. B., Olitsky, P. K. *Science*, 1937, 85, 336.
[15] MacFarlane, J. O., Ruchman, I. *Proc. Soc. exp. Biol., N.Y.* 1948, 67, 1.

Hitherto most cases of toxoplasmosis have been reported from America, though there have been reports from Czechoslovakia, Holland, Australia, and recently from Sweden[16] and Italy.[17] The first case in England is reported by JACOBY and SAGORIN in this issue. The observation by HEELEY of a toxoplasmic encephalitis in a dog, which they quote, is the first known example of the infection in a domestic animal in this country, though toxoplasma has been found in other animals. This observation is important, for animals appear, whether directly or through insect vectors, to be responsible for the human infection.

Annotations

TO ADVISE ON CHILDREN

THE new Advisory Council on Child Care, appointed by the Home Secretary in accordance with the Children Act, is fortunate in its chairman. Dr. Alan Moncrieff is Nuffield professor of child health in London University, and has great understanding of the physical needs and potentialities of children. The council includes Lady Allen of Hurtwood, whose letter in the *Times* four years ago led ultimately to the appointment of the Curtis Committee, and hence to the Act. The names of the remaining members, which are printed in our Parliamentary columns, also inspire confidence, for they represent both Church and lay voluntary societies interested in children's welfare, psychiatry, the juvenile courts, education, and local government. The Act is founded on the children's officer, conceived as the personal friend of the children under her care; and it is administered by the Home Office (which has a long tradition of serious regard for childhood), now advised by a body of people whose experience and deeds have proved their sympathy with children. The Act was specifically devised for the welfare of individuals, and the new council should help to guarantee the individual approach.

PREVENTION OF RUBELLA

A FEW years ago it would have seemed laughable for a research institute to expend time and funds on rubella prophylaxis; but the establishment of a connexion between maternal rubella and congenital defects, stillbirths, and miscarriages has entirely changed the position. The production of a simple, safe, and effective rubella prophylactic for pregnant women exposed to infection would relieve anxiety and prevent an appreciable proportion of fœtal deaths and deformities. In Britain and the United States research on this subject has been hindered by the absence of extensive outbreaks in adults since 1940–41. But the disease has been prevalent in Australia, where an epidemic in the naval base at Flinders, Victoria, provided Prof. F. M. Burnet, F.R.S., Dr. S. G. Anderson, and their colleagues at the Walter and Eliza Hall Institute, Melbourne, with material for virus studies and a large amount of convalescent serum.[18]

Attempts to cultivate the virus on the developing chick embryo were unsuccessful, but the disease was transmitted to 9 out of 16 women student volunteers by getting them to inhale filtered throat-washings atomised by compressed air. None of the remaining 7 students developed rubella, despite close contact with the infected ones; so it seems probable that they were alread immune. It was shown that the virus is present in hig concentration in throat-washings taken from patients the height of their rash; such washings remain activ indefinitely if frozen, and they can be used to produc infection when desired. It should thus be practicabl to infect a young woman at will and at a convenien time, instead of waiting for an epidemic, and virtuall to guarantee her immunity from rubella during an subsequent pregnancy. Burnet mentions the possibilit of a seaside holiday camp where women could spend fortnight to be immunised without any risk of the infecting others. Active immunisation could also practised in a resident institution such as a girl boarding-school.

The convalescent serum collected was processed the Commonwealth Serum Laboratories, and the gamm globulin extracted was given to 22 presumably susceptib pregnant women, all of whom had been in proved possible contact with rubella. None developed a ra This passive method would of course be a far simpl way of protecting pregnant women against rubella th artificial infection, but it must also be far less certai since in a susceptible woman the fœtus may well damaged before she knows herself pregnant—and inde there are now several reports of congenital defec arising when the mother has had rubella shortly *befo* conception. It would be useful to know wheth gamma globulin will modify an induced infection witho interfering with the subsequent immunity (experien with measles suggests that it will). If so, it may great increase the popularity of active immunisation; f unmodified rubella, though very rarely serious in gi or young women, often makes them unpleasantly ill.

THE MENTAL HOSPITALS

THE report of the Board of Control for 1947 hard paints a reassuring picture. Overcrowding in publ mental hospitals, though somewhat less than it has bee remains in the board's words "one of the main difficulti which have to be overcome." At the end of 194 there were 144,736 people under care, compared wit 145,391 in 1946; 128,817 of these were in public ward and 14,668 of them were overcrowded "on the basis o recognised standards," compared with 16,662 at th end of 1946. Even "recognised standards" are no necessarily the best that could be wished. It is a faul of our mental hospitals, built for the most part at th height of the Gothic revival, that the large wards wit their gloomy narrow windows look at once crowded an bleak. The mentally ill are at present obliged to spen their days in close contemplation of others as sick a themselves; and it is a matter for speculation how muc mental disorder is perpetuated by this necessity. Eve a mentally normal person convalescing from a physica illness would find his mood and outlook affected by suc surroundings; the sick mind finds in them a giant obstacle to recovery, as those who have been mentally ill can attest. Overcrowding of a mental hospital ward means not merely that these depressing circumstances are reinforced, but also that there is a falling off in individual care, and an increase in offensive sounds and smells—even sometimes of squalor. At present more than 14,000 mentally sick people are enduring it.

The reasons for the lack of beds are clear enough: no fresh building has been done since 1939; a growing population has meant an increase in the numbers (though not in the incidence) of the mentally sick; at the end of 1947 over 5000 beds were still diverted to war-time purposes, and of 4908 beds returned during the year nearly 4000 still needed re-equipping; and nearly 2000 beds were out of use for lack of nursing staff. This situation has had a most unfortunate secondary effect:

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[16] Magnusson, J. H., Wahlgren, F. *Acta path. microbiol. scand.* 1948, 25, 215.

[17] De Toni, G. *Min. Med.* 1948, 39, 157.

[18] Report of the director of the Institute for 1947–48.

To keep overcrowding within limits many hospitals have restricted themselves to certified cases and have declined all voluntary patients—a practice detrimental to the whole scheme of voluntary treatment. It is encouraging, however, that taking the country as a whole, voluntary admissions have continued to mount in relation to certified admissions, and during 1947 accounted for [illegible]4·5% of the total of 39,223 admissions. There were signs, too, that staffing difficulties were not as bad as they had been, at any rate in some areas. The incidence of tuberculosis among patients showed an increase from [illegible]·5 per 1000 in 1946 to 8·8; this may be compared with the average of 8·1 over the last ten years. In public mental hospitals the death-rate was 7·62 per 1000 daily average population of the hospitals, as against 7·35 for 1946.

Some useful work has been done by the British Red Cross Society and the Order of St. John in supplying books to patients; and the Women's Voluntary Services have organised social activities. An interesting experiment is the Council for Music in Hospitals, founded by Sir Steuart Wilson. This body arranges good concerts, and was giving them in ten hospitals by the end of the year.

DEATH FROM EXPOSURE TO BERYLLIUM

At an inquest in London last week on a 36-year-old physicist, the jury returned a verdict of death by misadventure as a result of heart-failure and granulomatous fibrosis of the lungs from exposure to compounds of beryllium.

The coroner remarked that this was probably the first case of its kind in the country. He ascertained that the man was exposed to compounds containing beryllium oxide between December, 1941, and December, 1942; the compound in question here was zinc beryllium manganese silicate. The man's first symptoms had not come on until three years later, in December, 1945.

Dr. W. W. Woods stated that death was due to granulomatous fibrosis of the lungs and failure of a hypertrophied right heart. The microscopical appearances in the lungs somewhat resembled silicosis and sarcoidosis, but were not typical of either. The picture was not one which Dr. Woods had met before, but in view of the recent reports from the U.S.A. he considered that death was due to beryllium poisoning.

Dr. John Agate said that the deceased man's condition had gradually deteriorated since he first saw him in February, 1948. He had been suffering for three years from cough, breathlessness, and extreme loss of weight. Diagnoses of miliary tuberculosis and sarcoidosis had been made and later abandoned; there was little doubt now that the true diagnosis was granulomatous fibrosis of the lungs, brought about by exposure to the dust of beryllium compounds.*

Questioned by the coroner about preventive measures, Dr. Agate said that he thought that the best procedure was to abandon the use of beryllium wherever possible. It would be possible to extract the dust from processes, but he was not quite sure whether perfect safety could be achieved by this means in ordinary manufacturing works. The deceased had been exposed to risk while doing research on fluorescent lamps; at that time the delayed form of pneumonitis due to beryllium compounds was not recognised, so he would not have taken special precautions.

A representative of the employers said that preventive measures had been adopted and would be increased. New fluorescent powders which did not contain beryllium were being evolved.

SALARIES OF PROFESSORS AND LECTURERS

At a time when academic salaries are being vigorously discussed, in our correspondence columns and elsewhere, it is useful to have the University Grants Committee's account of the principles they have followed.[1] Before the war salaries in universities remained well below the level the committee would have thought satisfactory; though it has never been their view, or the view of the universities, that academic rewards should be comparable with financial prizes in commerce, industry, or the competitive professions. "The expectation of a large income," they note, "is not among the motives which lead to the adoption of an academic career." The man who enters it should have the same prospect of marrying and maintaining himself and his family as any other moderately successful member of other learned professions, and of providing satisfactorily for the education of his children. The committee thought, also, that academic salaries should also take into account the need to accumulate a private library, to join learned societies, and perhaps to travel abroad. These principles are still sound, they believe; for, if salaries are insufficient to meet these basic needs, teachers without private means—and that includes most of them—are obliged to supplement their incomes by doing extraneous work. It seems that, before the war, few universities could pay their lecturers on a scale sufficient to spare them this necessity; and the rise in the cost of living which followed the war made matters worse. Thanks to an increased Treasury grant it then became possible to revise salaries with these principles and difficulties in mind.

In 1938–39 professors were paid, on an average, £1115, an advance of about £20 on the figure for 1934–35. In 1946–47 the corresponding figure was £1534. Before the war salaries varied, being highest in universities with the greatest income from endowments: these in the main were the universities with large departments and heavy teaching and administrative duties. In some universities higher salaries were paid to professors in some scientific subjects and in engineering, where there was serious competition with industry. The committee had to decide whether these relative differences should be retained; they finally agreed to reduce but not abolish existing inequalities, and followed the plan of recognising for all institutions a standard rate of professorial salary (distinguishing, however, between universities and university colleges) and assessing for each institution an appropriate sum to be expended in raising these salaries above the standard rate. They decided on £1450 a year for universities and £1350 a year for university colleges. The supplementary amounts were assessed according to the number of chairs in the university, the numbers of students to be taught, and the proportion of chairs in scientific and technological subjects. The committee made no attempt to assess the salary to be paid to a particular professor: that is the affair of the university. Many universities think it just to pay more to professors with large departments and heavy administrative responsibilities; and competition with industry may make higher salaries necessary in some scientific subjects.

Readers' and lecturers' salaries are naturally related to the scales paid to professors. Thus the salaries of readers now range from £800 to £1200 a year, and those of senior lecturers from £900 to £1100; while assistant lecturers and demonstrators now receive £400–450, as compared with about £300 before the war. Those ex-Servicemen who were appointed at the end of the war are given higher salaries, appropriate to their age and family responsibilities. Nearly all universities now have a system of family allowances for their staffs; and teachers on retirement receive pensions through the Federated Superannuation System for Universities.

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* This case was reported in an article by Dr. Agate on Oct. 2 (p. 530).

[1] University Development from 1935 to 1947. London: H.M. Stationery Office. 1948. p. 45 et seq.

PENICILLIN INHALATION FOR POSTOPERATIVE COMPLICATIONS

THE inhalation of penicillin aerosol produces effective penicillin levels in the sputum, and its value is undisputed in pulmonary disease associated with sensitive organisms.[1] The place of this therapy in the treatment of postoperative pulmonary complications is not so certain. It is generally believed that collapse of the lung after operation derives mainly from mechanical and physiological disturbances of respiration brought about by the operation itself and by the anæsthetic. Subsequent invasion by bacteria is probable, and in certain circumstances—for example, in old age or with toxæmia or pre-existing lung disease—bronchopneumonia may ensue.

The influence of penicillin inhalation in preventing this bacterial invasion has been investigated by Taplin and his colleagues.[2] They found that most postoperative pulmonary infections are caused by organisms already present in the respiratory tract before operation, and that nearly all the organisms normally residing in the tract are sensitive to penicillin or streptomycin. Though not impressed by the aerosol method, they believe that these drugs can be effectively inhaled in the micropulverised ("micronised") form, the powder having a particle size of about 1 μ. In this powder the vehicle is dextrose, which may act as an expectorant since, when first dissolved, it forms a hypertonic solution. The treatment is apparently well tolerated by patients, who quickly learn how to inhale the powder properly and to avoid coughing. Penicillin and streptomycin assays of peripheral pulmonary tissue from patients who had undergone thoracotomy showed that the powder penetrates to the terminals of the bronchial tree; and Taplin and his associates suggest that this form of inhalation therapy should be started some time before operation, so as to reduce or eliminate the bacterial population in the upper respiratory tract.

A few weeks ago Holborow and Spriggs[3] reported in these columns that nebulised penicillin did not significantly reduce the incidence of chest complications. Thus it seems to be agreed that penicillin aerosol is disappointing. Micropulverised powder containing penicillin and streptomycin seems more promising; perhaps with it the treatment of the ubiquitous postoperative "chest" will be taken one step further.

THE DENTIST'S EARNINGS

THE Spens Committee on the remuneration of dentists thought that an efficient single-handed dentist working 33 chairside hours a week should be able to earn a net income of £1600 a year at the 1939 value of money. A general medical practitioner on a comparable standard of full but not unusually heavy work would, they thought, command £1800, the difference being justifiable because the doctor would have less leisure and less time entirely off duty. If 20% is added for betterment, the Spens income of £1600 becomes £1920; and if the practice expenses of a dentist are reckoned at 52% he will require a gross income of about £4000. The Ministry of Health accepted £3800 as a reasonable figure for the gross earnings of a dentist working 33 chairside hours, and recognising that for many dentists the volume of work makes longer hours necessary it sees no reason why an additional £1000 should not be earned, making £4800 in all. But it is well known that some dentists in the National Health Service are in fact earning far larger incomes, particularly in industrial areas, where gross takings at the rate of £7000–8000 are said to be not uncommon; indeed here and there the rate is as high as £12,000 a year. Accordingly the Ministry has decided that from the start of next year gross annual earnings beyond £4800 by dentists in the service will be reduced by half. The relatively high incomes are attributable not only to long hours of work, but also to scales of fees which have proved more generous in practice than was expected. A thorough review of the scales is to be undertaken. Meanwhile officials of the dental organisations have protested that an investigation, with the dental profession participating, should precede any change and that the change now announced will discourage dentists from working the longer hours required by the public need. It yet remains to be shown how the general medical practitioner is to obtain the advantage in remuneration to which the Spens Committee thought he was entitled.

THE MEDRESCO HEARING-AID

OVER 3000 of the hearing-aids designed by the electro-acoustics committee of the Medical Research Council have so far been distributed through the National Health Service. An efficient and quite powerful valve-amplifying aid of the portable type, the Medresco is about the most powerful instrument for its size at present manufactured. The microphone and valve circuit are housed in a small plastic container, while the batteries are in a separate leather pack—a little bulky because the batteries are designed to give a long service. The two batteries, high-tension and low-tension, have different shapes of plug fitting so that no mistake is possible in connecting the wires. As ear-piece the patient can choose between a crystal insert and a telephone: the former is the more efficient and can readily be attached to a plastic meatal mould which is made in several sizes. The volume-control has a good range but is somewhat clumsily built. The instrument as a whole naturally lacks the finish and some of the refinement of the best commercial aids of this type, but it is easy to use and is robust enough to stand up well to wear and tear.

THE KING'S HEALTH

The following bulletin was issued from Buckingham Palace last Monday:

> The King's general health continues to be good, and he devotes a considerable proportion of his time to the conduct of affairs of State.
>
> The process of restoration of the arterial circulation to the feet is proceeding slowly, and since the bulletin of Nov. 29 a further small but encouraging improvement has occurred.
>
> In order to secure the rest and the warm environment which are indispensable for the re-establishment of the circulation, his Majesty is remaining in his apartments and spends most of the time in bed.
>
> MAURICE CASSIDY
> THOMAS DUNHILL
> J. R. LEARMONTH
> MORTON SMART
> JOHN WEIR.

DR. ARTHUR ROBINSON, emeritus professor of anatomy in the University of Edinburgh, died at Eastbourne on Dec. 3, at the age of 86.

DR. F. B. PARSONS, physician to Addenbrooke's Hospital, Cambridge, died in London on Dec. 4, at the age of 46.

We also regret to announce the death on Dec. 4 of Sir EDWARD STEWART, K.B.E., M.D., a former vice-chairman of the British Red Cross Society. He was in his 92nd year.

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[1] Mutch, N., Rewell, R. E. *Lancet*, 1945, i, 650. Humphrey, J. H., Joules, H. *Ibid*, 1946, i, 221.

[2] Taplin, G. V., Cohen, S. H., Mahoney, E. B. *J. Amer. med. Ass.* 1948, 138, 4.

[3] Holborow, E. J., Spriggs, E. A. *Lancet*, Oct. 30, p. 688.

1. *Lancet*, 1947, ii, 801.

Special Articles

THE PATHOLOGICAL SERVICE OF A DISTRICT HOSPITAL

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Medical and pathological facilities have rapidly developed at this hospital, particularly in the latter part of the eighteen years of its control by the Middlesex County Council. The administrative lessons, and indeed the ethics, of this development may be of topical interest in view of the probable expansion of hospital services in the National Health Service.

The main function of a hospital laboratory service is to help the clinician in diagnosis and in the scientific control of treatment. This demands close coöperation with the clinician, and laboratory help must be available day and night. The laboratory must also undertake public-health duties for the hospital, such as watching the efficiency of the sterilisers and the quality of milk supplied to the hospital, and the laboratory staff must play a part in the clinical activities of the hospital—attending scientific meetings of the staff, collaborating with the clinicians in original investigations, and assisting in the teaching of students and nurses.

Each group of hospitals under a regional board needs a pathological service capable of undertaking all routine examinations. Highly specialised work, such as examinations for filtrable viruses, phage typing of staphylococci, and the estimation of ketosteroids, may be referred to various centres either within the hospital region or throughout the country. Already certain individuals are recognised not merely as specialist pathologists but also as experts in one type of examination, and they are usually willing to help their colleagues, and at the same time to enlarge their experience in their "ultra-specialty."

In this hospital of 800 beds the amount and variety of the work require three senior pathologists—a morbid anatomist and histologist, a bacteriologist, and a "clinical biologist" who undertakes the biochemistry and hæmatology—and they are supported by three junior pathologists.

The laboratory of a hospital of this size is suitable for training junior pathologists. A 24-hour laboratory service was started last year, and the three junior pathologists take turns to carry out for a week at a time the urgent examinations outside laboratory hours. They are resident when on duty. One of them, in addition, has charge of the hospital blood-transfusion service under the supervision of the hæmatologist.

TECHNICAL STAFF

The staff consists of one chief technician, six technicians, ten laboratory assistants, two orderlies, and two clerks. The attendants of the animal-house and the post-mortem room are seconded from the steward's staff.

The junior technical staff is mainly recruited directly from school, and the possession of the School Certificate is essential. The local schools send an intermittent stream of youths and girls seeking employment in the laboratory. Informal talks allow a much better appreciation of suitability than do formal interviews, and permit the young person to ask questions and see the work and the staff. A few of the more promising applicants are allowed to visit the department regularly for a week or a fortnight to give them a better idea of the work. The care and time spent in this sifting process are amply rewarded by the collection of technicians and trainees who are the justifiable envy of many other laboratories for their ability, personality, and esprit-de-corps.

All trainees accepted are urged to join the Institute of Medical Laboratory Technology as student members. They are interchanged at suitable intervals among the different sections of the department to give them all-round experience in their preparation for the intermediate examination of the institute after three years in the laboratory. This interchange also helps the laboratory to meet emergencies caused by illness, holidays, or a sudden rush of work in one section. The National Service Acts do not interfere with the training of the male students, for it has been arranged that their call-up be deferred for three years. Later, in preparation for the final examination admitting to the associateship of the institute, tuition is given by the various pathologists. The conditions of service are good, and the allowance of time off duty for approved study in addition to their tuition in the laboratory is much appreciated.

Members of the technical staff attend the scientific meetings of the London branch of the Institute of Medical Laboratory Technology and the meetings of their own Middlesex County Technicians' Society. Further, they can attend the weekly clinicopathological demonstrations held by the medical staff of the hospital, particularly when their own technical work is concerned. Taking part in such meetings increases the interest and raises the status of their work, and provides a useful opportunity for the medical staff to meet them.

ADMINISTRATION

Each of the three pathologists is in charge of his own section of the department. Problems affecting one section only, such as techniques used, are entirely within the discretion of the individual pathologist. For administration one of the pathologists is recognised as the normal channel between the department as a whole and outside persons and bodies. He is justified in discussing problems, technical and personal, with his colleagues, but his advice and opinions need not necessarily be adopted. Weekly informal meetings of the three pathologists ensure a uniformity of policy, a continuity of control, and a means of friendly discussion of technical problems.

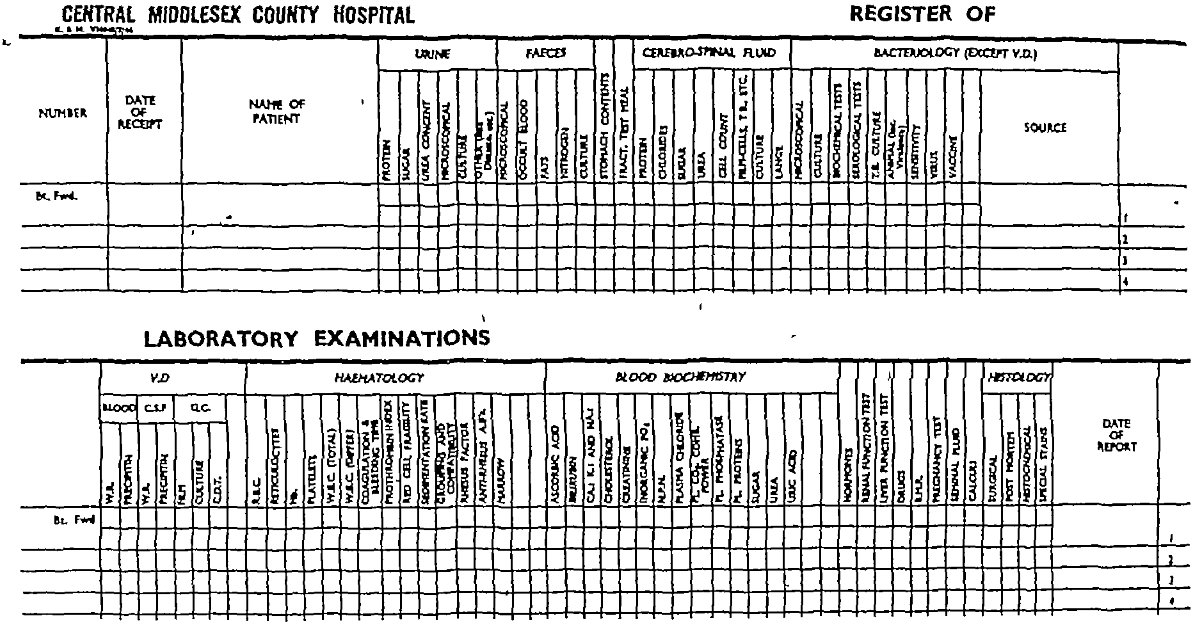
It is important that the pathologists keep their knowledge up to date, and good library facilities supplied by the hospital are invaluable. Besides the general medical and surgical journals available in the hospital library (Avery Jones 1948) there are the *Journal of Pathology and Bacteriology*, the *Journal of Bacteriology*, the *British Journal of Experimental Pathology*, the *American Journal of Pathology*, and *Biological Abstracts*. Lately the hospital has been placed on the list of institutions privileged to borrow from the Science Library books on pure and applied natural science which are not in any of the medical libraries.

It is very desirable that the senior staff should attend meetings of societies such as the Pathological Society of Great Britain and Ireland and the Association of Clinical Pathologists, according to the particular interests of each worker. Further, the pathologists of the Middlesex County Council formed last year an advisory group. The meetings are informal and allow of discussion and the interchange of ideas.

PRACTICAL WORKING OF LABORATORY

Every effort has been made not to allow restrictions in building and in the use of materials to impede the work, but expansion of the department is urgently required. The best use has therefore been made of the available space.

Part of a corridor partitioned off makes an office for the receipt of specimens, the dispatch of reports, and the keeping of records. One of the store-rooms, made light-tight and



CENTRAL MIDDLESEX COUNTY HOSPITAL

REGISTER OF

NUMBER	DATE OF RECEIPT	NAME OF PATIENT	URINE						FAECES					STOMACH CONTENTS	FRACT. TEST MEAL	CEREBRO-SPINAL FLUID								BACTERIOLOGY (EXCEPT V.D.)										SOURCE	
			PROTEIN	SUGAR	UREA CONCENT	MICROSCOPICAL	CULTURE	OTHER TESTS (Diastase, etc.)	MICROSCOPICAL	OCCULT BLOOD	FATS	NITROGEN	CULTURE			PROTEIN	CHLORIDES	SUGAR	UREA	CELL COUNT	PUS-CELLS, T.B., ETC.	CULTURE	LANGE	MICROSCOPICAL	CULTURE	BIOCHEMICAL TESTS	SEROLOGICAL TESTS	T.B. CULTURE	ANIMAL (Inc. Virulence)	SENSITIVITY	VIRUS	VACCINE			
Bt. Fwd.																																			
																																			1
																																			2
																																			3
																																			4

LABORATORY EXAMINATIONS

	V.D								HAEMATOLOGY																BLOOD BIOCHEMISTRY																HORMONES	RENAL FUNCTION TEST	LIVER FUNCTION TEST	DRUGS	B.M.R.	PREGNANCY TEST	SEMINAL FLUID	CALCULI	HISTOLOGY				DATE OF REPORT	
	BLOOD		C.S.F		G.C.																																																		
	W.R.	PRECIPITIN	W.R.	PRECIPITIN	FILM	CULTURE	C.F.T.		R.B.C.	RETICULOCYTES	Hb.	PLATELETS	W.B.C. (TOTAL)	W.B.C. (DIFFER)	COAGULATION & BLEEDING TIME	PROTHROMBIN INDEX	RED CELL FRAGILITY	SEDIMENTATION RATE	GROUPING AND COMPATIBILITY	RHESUS FACTOR	ANTI-RHESUS A.P.	MARROW			ASCORBIC ACID	BILIRUBIN	CA., K. AND NA.	CHOLESTEROL	CREATININE	INORGANIC PO_4	N.P.N.	PLASMA CHLORIDE	PL. CO_2 COMB. POWER	PL. PHOSPHATASE	PL. PROTEINS	SUGAR	UREA	URIC ACID											SURGICAL	POST MORTEM	HISTOCHEMICAL	SPECIAL STAINS		
Bt. Fwd.																																																						
																																																						1
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Headings of front and back of form.

fitted with an air-extractor and safe light is a photographic dark room. A fan and chimney help to ventilate the overcrowded media room. Part of that room is partitioned off as a dust-free space for the pouring of plates. An unused portion of the roof, walled off and covered in, houses a large refrigerator, centrifuge, and clothes lockers, &c. Numerous additional electric and gas points allow use to be made of tables and benches hitherto wasted. Fluorescent lighting facilitates work in corners previously dark. Extra shelves allow of the clearing of benches, and an old shed, enlarged and made rat-proof, has increased the accommodation for animals.

Work which can reasonably be deputed should not be undertaken by a skilled and highly paid worker. This does not mean that the juniors should act as cleaners, but skilled technicians should not, for instance, have to spend a large proportion of their time cleaning glassware. The preparation of glassware is a major problem in a laboratory, and carelessness in cleaning one batch of universal containers may cause numerous complaints from all over the hospital as well as invalidating work done. Several unsuccessful experiments showed that washing up is best done by women employed as department orderlies similar to the female ward orderlies on the matron's staff. The laboratory trainees must, of course, learn the preparation, cleaning, and sterilisation of glassware as part of their training, and they now have before them an example of cleanliness and order resulting from intelligent and conscientious work in the wash-up room.

A remarkable wastage of the time of workers trained and in training is seen in the use of members of the medical and nursing staff for the transmission of specimens to the laboratory, and the appointment of a porter for this purpose is recommended.

In 1938, 16,665 specimens were examined. The number rose to 31,378 in 1942, 48,279 in 1945, and 69,579 in 1947. The variety and nature of the examinations are becoming increasingly complicated, but the rapid assessment of new methods has in many instances saved time. For instance, the adoption of Chown's technique has shortened to 10 min. the time required for the determination of A,B,O, and Rh groups, and is therefore specially useful for obstetric emergencies. The dangers, immediate and remote, of transfusing rhesus-negative preclimacteric women with rhesus-positive blood are reduced by the preliminary screening with anti-D serum of the samples taken for the Wassermann and Meinicke tests from all patients attending the antenatal clinics. Unfortunately, however, many of the emergency obstetric patients received by the hospital have not been seen before their need for transfusion arises; so a blood bank of some 60 pints of rhesus-positive and 3–8 pints of rhesus-negative blood is maintained.

The 24-hour service allows the fullest use to be made of these new methods, and has been justified by the requirements of the transfusion service alone. The frequent need for speed in transfusion does not allow of delay in summoning non-residents during the night and therefore necessitates the use of resident staff. In one week alone 63 pints of blood were transfused. Of these, 24 were used outside laboratory hours. The immediate availability of the resident pathologist ensures speed as well as accuracy. Emergency transfusions are often required for young women after abortion and rhesus-incompatible transfusions can now be eliminated. Apart from the occasional lives thereby saved the sensitisation of rhesus-negative women and the resulting hæmolytic disease of their newborn children are obviated (Discombe and Hughes 1948).

The day-and-night service is much appreciated by the clinicians, who can always obtain an emergency estimation of blood-sugar in a difficult diabetic case, or of urinary diastase in an acute abdominal case, or an examination of cerebrospinal fluid in suspected meningitis. Throat swabs and blood-cultures can be undertaken with the minimum of delay, and there are many research projects which are greatly facilitated by these pathological facilities during the night as well as the day.

The service is of real value for the training of young pathologists, who have the opportunity of assisting in a responsible rôle in the management of many emergencies.

RECORDS AND REPORTS

Particular attention has been devoted to method and accuracy in the filing and reporting of the work of the laboratory. Request forms accompanying each specimen are used to take a carbon copy of the report, and are filed in alphabetical order. Though the carbon copies may not be so satisfactory as cards, this saves the employment of an additional clerk. When a specimen is received, the clerk stamps the request form, the blank port form,, and the left-hand column in a register ıth the numbering machine, which automatically lvances after every third stamp. The register of aminations is kept in a large loose-leaf file. The headings e reproduced in the accompanying figure. There e horizontal spaces for thirty different specimens, ıd two extra ones for "-brought forward" at the top ıd "totals" at the foot of the page. The clerk inserts e date and the patient's name, *and hands the specimen* the technical staff, who insert on the carbon of the port a letter and a number—e.g., U indicates urine, protein, 2 sugar, and so on, to help the clerks to cord accurately the examinations by figures in the ppropriate spaces. The register is of value in tracing e receipt of specimens and dispatch of reports, and lowing an accurate estimation of the total numbers examinations done.

COÖRDINATION WITH OTHER WORK OF THE HOSPITAL

Medical Staff.—Close contact is maintained with the inicians, and every possible help is given them. Their sits to the laboratory are welcomed, and if they miss tending a necropsy in which they are interested they ın see the specimens at demonstrations held in the ırly afternoon. For junior newcomers and some of ıe nurses a pamphlet has been prepared giving brief etails of the amount and nature of the specimens quired for different estimations, along with a table of verage results of the more infrequent tests. In it the ecessity of full clinical details is emphasised.

The medical staff of the department takes a share ı the weekly clinicopathological meetings of the hospital taff, showing naked-eye and microscopic specimens, nd introducing some of the discussions.

General Practitioners.—Fortnightly meetings are run y the hospital staff, including the pathologists, for the ocal general practitioners. One of the staff gives an nformal talk on his own subject, with illustrations from he ward or laboratory, and a discussion follows.

Undergraduates.—A few undergraduates are attached o the department for periods of three months, each pending three weeks in each of the four sections. The udents see the daily routine and can repeat the work emselves.

Nurses.—Elementary bacteriology can be most profit- y taught to nurses, not just to enable them to pass eir examinations but to instil the general principles to make them act intelligently rather than by rule of thumb.

The Medical Research Council's memorandum on the control of cross-infection in hospitals (1944) shows how bacteriological knowledge should be used *in the everyday* life of a hospital, and outlines a course of practical bacteriology for nurses. The chief characteristics of bacteria, such as their size, numbers on solid or in liquid media, motility, staining reactions, habitats, methods of spread, and relation to disease are described.

An important *practical* lesson is conveyed by demonstrating to nurses their own bacterial flora. One nurse has her fingers rubbed with a swab moistened in sterile saline and the organisms grown on blood-agar, and the experiment is repeated after washing the hands in soap and water. A second nurse is made to speak continuously over an open plate and to repeat the process after donning a face mask. A third brushes her hair over uncovered medium to illustrate the value of a covering of sterile gauze.

PUBLIC RELATIONS

One of the pathologists acts as press officer and is responsible for publicity in the local press, not only for medical but also for social information. This has appreciably helped the local drive for blood donors.

ECONOMIC CONSIDERATIONS

Ffrangcon Roberts (1948) has drawn attention to the economics of the accelerated expansion in the expenditure of money and man-power on medical services in spite of our present economic plight. When a pathologist was first appointed to this hospital ten years ago, the staff of the department consisted of two technicians, who had been appointed the previous year. Today it consists of three senior pathologists, three junior pathologists, and twenty-one technical and clerical staff. In the first place the increase may be regarded as part of *the development of the whole hospital from a poor-law* institution in 1929 to a modern general hospital in 1948. During that period the proportion of acute to chronic patients became inverted, and the need for pathological services increased accordingly. Secondly, the scientific control of treatment has advanced very considerably in recent years, and the many different sulphonamides have made necessary estimations of sensitivity and assays in body fluids. The use and study of penicillin and streptomycin have required much laboratory assistance. The treatment of a difficult hæmatemesis, of oliguria, or of jaundice may make heavy demands on the transfusion and biochemical workers of the department. But vigorous transfusion or the careful check on blood chemistry now help to save patients whose cases would have been assumed to be hopeless less than ten years ago. Routine rhesus testing will in time reduce the incidence of erythroblastosis fœtalis by eliminating the sensitisation of women in the reproductive period of life. Other new methods requiring careful laboratory control, such as the treatment of thrombophlebitis with heparin and dicoumarol, can shorten the illness and the stay in hospital. The increase in staff needed for the adequate laboratory control of such treatment is offset by the advantages to the patient, the clinician, and the hospital service.

The study of the natural history of disease and the response to new methods of treatments is an important function of any large district hospital. It necessitates heavy demands on laboratory workers to make investigations for the purposes of records rather than for the control of treatment. The pathologist is entitled to view *critically all such demands on his department to make* certain that such results are actually used. A slight hurdle in the laboratory to be negotiated by those interested in research may act as a useful stimulus for the collection and analysis of results already obtained.

Clinicians are apt to persist in certain ritual investigations long after the need for them has ceased. This may be the result of habit and innate conservative outlook, or because their assistants think they want them. For instance, Himsworth (1948) has shown that, in the treatment of thyrotoxicosis, the determination of the *basal metabolic rate is unnecessary save for diagnosis.* It is highly probable that many other routine investigations could be reduced or even abandoned, except perhaps at certain research centres, and there is sometimes unnecessary duplication of work when patients are admitted from the outpatient department.

Pathologists in district hospitals with access to abundant human pathological material are in a position to help colleagues in research institutes and university departments less favourably situated as regards material. Contacts so made stimulate a more scientific outlook on *medical problems by the hospital staff, and this in* turn increases the demands on the laboratory. It must be remembered, too, that any reorganisation or development can only be made if there is a slight surplus of staff over routine requirements.

CONCLUSION

The development of the pathological services of a hospital which is being upgraded can be extremely rapid.

Whole-time staffing allows a useful liaison between the pathologists and clinicians far closer than if they were part-time workers.

A well-developed pathological laboratory greatly increases the amount and standard of the original work of which the hospital staff is capable.

Thanks are due to Dr. F. Avery Jones, Dr. George Discombe, and Dr. Horace Joules, and numerous other colleagues for their generous collaboration in the development of the pathological services of the Central Middlesex Hospital and for their help in the preparation of this account of its growth.

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INDUSTRIAL HEALTH RESEARCH BOARD

The Medical Research Council have appointed the following to serve as members of the board during the next three years:

Sir Frederic Bartlett, C.B.E., F.R.S., professor of experimental psychology, University of Cambridge (chairman); Sir Charles Bartlett, managing director, Vauxhall Motors; R. V. Christie, M.D., D.SC., F.R.C.P., professor of medicine, University of London; C. R. Dale, social insurance department, Trades Union Congress; A. N. Drury, C.B.E., M.D., F.R.S., director of the Lister Institute of Preventive Medicine; Sir Luke Fawcett, O.B.E., general secretary, Amalgamated Union of Building Trade Workers; Thomas Ferguson, M.D., D.SC., F.R.C.P.E., professor of public health, University of Glasgow; Sir Claude Gibb, C.B.E., D.SC., F.R.S., chairman and managing director, C. A. Parsons & Co., Newcastle-on-Tyne; A. Bradford Hill, D.SC., professor of medical statistics, University of London; Esther M. Killick, M.SC., M.R.C.P., professor of physiology, University of London; R. E. Lane, M.B., F.R.C.P., Nuffield professor of occupational health, University of Manchester; Arthur Massey, C.B.E., M.D., chief medical officer, Ministry of National Insurance; E. R. A. Merewether, C.B.E., M.D., F.R.C.P., H.M. senior medical inspector of factories, Ministry of Labour and National Service; J. M. Rogan, M.D., F.R.C.P.E., Medical Research Council headquarters staff; Donald Stewart, M.D., F.R.C.P., chief medical officer, Austin Motor Co.; Mrs. Joan M. Faulkner, M.B., Medical Research Council headquarters staff (secretary).

The board is appointed to advise and assist the council in the part of their research programme which relates to occupational health. The detailed consideration of research work is in the hands of scientific committees dealing with such subjects as occupational medicine, occupational physiology, occupational psychology, industrial pulmonary diseases, toxicology, and statistics. These committees report directly to the council for purposes of immediate action. The function of the board itself is that of a reviewing body considering general policy for research over the whole field.

"... The greatest of researchers have had the rare quality of genius ... a genius is often unappreciated by his contemporaries. He cannot be organised into any scheme, for he creates his own world. ... Yet it would be wrong to suggest that discovery is dependent on genius, for this could serve as a soft excuse for inaction. ... As genius is unpredictable, so also is chance. Nor can it be planned for, otherwise than by creating environments in which it can be exploited. ... There is one inauspicious quality, however, that does appear to have a significant association with research; that is eccentricity, or sometimes rather a reputation for eccentricity. The memory of Hughlings Jackson was curiously erratic. He could never remember a patient's name, nor could he find his way to his own wards without a guide; but he could remember in the minutest detail any fact that bore on one of his own doctrines. Henry Cavendish, the millionaire investigator of hydrogen and many other things, was so morbidly shy that the mere introduction to him of a stranger at Sir Joseph Banks's house was sufficient to make him turn and run in terror ... eccentricity may not necessarily be part of the make-up of a great researcher, but it is a risk to which intense devotion to a specialised field is apt to expose him."—Dr. E. H. Derrick in a lecture on the Spirit of the Researcher, *Med. J. Aust.* Nov. 27, p. 621.

Medicine and the Law

Artificial Insemination and Incapacity to Consummate Marriage

When Mr. Cecil Binney addressed the Eugenics Society on artificial insemination last October,[1] he seemed to favour the view that, where the husband is the donor, the law of nullity was unlikely to be applied. In L. *v.* L., tried before Mr. Justice Pearce on Nov. 30, the unlikely has occurred. A wife, artificially inseminated by semen from the husband, was awarded a decree of nullity on the ground of his incapacity to consummate the marriage. An unhappy consequence is that the child, conceived as the result of the artificially assisted intercourse between a married man and his wife, becomes illegitimate. There was no marriage; the offspring is therefore a bastard.

In summarising the history of the material events, the judge stated that the husband's trouble was largely psychological. The wife had persisted in the marriage for five years. Besides her natural desire for a child, she had hoped that a child would help their relationship and enable him to overcome his difficulty. Eventually she left him; at that moment she did not know that, as the result of the artificial insemination to which they had had recourse, she was in fact pregnant. When she took proceedings for a decree, the husband not unreasonably contended that her conduct in voluntarily undergoing the artificial insemination was an approbation of the marriage, and that, not only in the interests of the parties but also in the interests of the public, the marriage should not be annulled. In addition to this reliance upon public policy he urged that, if the marriage were continued, there was hope of his condition being cured, and he drew attention to the illegitimacy of the child which would result if the petitioner's application was successful.

Mr. Justice Pearce observed that the marriage had hopelessly broken down; the wife had tried her best to make it a success in circumstances which inflicted strain and humiliation such as a sensitive woman could not endure indefinitely without serious injury to her health. She could never, he thought, bear to go back to her husband. "I see no hope of happiness by keeping these two people married." If he granted a decree of nullity, the mother might marry again; the husband might conquer his inhibition and enjoy normal married happiness. It was better for the child that a decree should be granted than if it were brought up by an embittered mother tied for life to a marriage which had "never been real" and which "only through the unnatural aid of science had produced the fruit of ill-marriage." It was regrettable, concluded the judge, that the child would become illegitimate; "but sons were not now judged by the errors of their parents." The few who would know the circumstances would probably know the full facts; there was nothing that reflected any dishonour on either side of the parents or the child.

There is much matter for discussion in all this; the ruling may in some form be reviewed some day by a higher court. Meanwhile it is to be noted that this was not a case of A.I.D. (artificial insemination by a donor other than the husband), that impregnation by the husband is not inconsistent with the legal idea of impotence, that a wife can voluntarily undergo artificial insemination and yet (in a sense) repudiate the performance, that a child conceived during a marriage as the consequence of a sexual act (however unnatural and however artificially produced) between husband and wife, can nevertheless be illegitimate, and that the courts have ceased apparently to give much weight to the prospect of bastardy.

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[1] See *Lancet*, Nov. 6, p. 738.

Public Health

PRIMARY MULTIPLE-PRESSURE VACCINATION OF INFANTS

COMPARISON WITH SCARIFICATION

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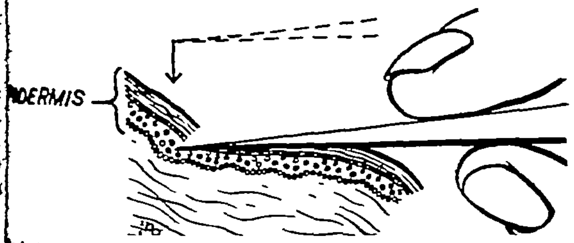
ASSISTANT CLINICAL PATHOLOGIST, GUY'S HOSPITAL

In clinics and centres in this country vaccination is ally done by scarification. Various other methods ve been introduced from time to time—e.g., intra- taneous injection—but they have not produced a nite and essential area of vesiculation and scarring have therefore been abandoned. On the other hand, the United States and Canada (Leake 1930) vaccina- by multiple pressure has been in general use for a time.

At Guy's Hospital we have used multiple pressure, on asions, with satisfactory results, and about a year ago et out to compare the efficiency of this method with t of scarification in primary vaccination. Since the stry of Health (1947), in its recent memorandum, mmends multiple pressure as the method of choice general use, our findings may be of interest.



1—Multiple-pressure vaccination by rapid up-and-down movement of flat side of needle against skin to break epidermis.

od

rimary vaccination is carried out as a routine in this rtment at the age of 3 or 4 months. The vaccination e on the arm, since vaccination performed elsewhere ociated with more severe reactions or secondary on. The left arm, just below the posterior border deltoid muscle, is the choice, unless the parent s on some other site.

A volatile antiseptic, either ether or acetone, is used clean the skin. A drop of lymph is placed on the skin the prepared site. A freshly sterilised straight needle the Hagedorn type is used for each child. It is held gentially to the arm between the thumb below and forefinger and middle finger above. The side of the dle is pressed firmly into the drop of lymph and then ed out, clear of the skin, in a plane perpendicular to skin surface (fig. 1). This movement is repeated pidly about ten times. It is important to remember s pressure with the side of the needle that pulls down epidermis over the point so allowing lymph to be forced into the deeper layers of the epidermis. The rapidly repeated pressures are made approximately in the same spot. The operation is painless, there is usually no bleeding, and the only visible sign is a small area of hyperæmia.

The lymph is left to dry for 2 min. before a light sterile dressing is applied. The infant comes up for routine inspection and re-dressing on the seventh and fourteenth days after vaccination.

The method is simple and rapid, and bleeding is less likely to occur than with scarification. It involves so little trauma that the risk of a severe local reaction or secondary infection is very small. The exact number of pressures is not important. We have used successfully about 10; the American reports give 10–30. The important point is to make sure the pressures are made firmly. At this centre, where we are teaching students to vaccinate, a student often fails to get a successful take when first using the method and making 10 pressures, whereas later, when he gets accustomed to the pressure required, 10 are sufficient.

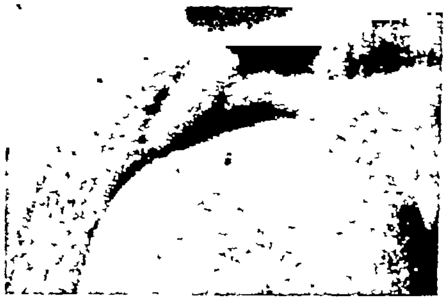


Fig. 2—Vaccination lesions on seventh day: upper lesion by scarification; lower lesion by multiple pressure.

Investigation.—A hundred unselected infants attending the clinic for primary vaccination were vaccinated by both scarification and multiple pressure. The left arm was used, as described above, and two drops of lymph from the same capillary tube were placed on the arm. 1 in. apart, one above the other. In the upper drop a $^{1}/_{4}$ in. scarification, and in the lower drop multiple pressure, was performed. The arm was examined on the seventh and fourteenth days, and the results were recorded. Failures were revaccinated by both methods.

TABLE I—GENERAL RESULTS OF VACCINATION OF A HUNDRED INFANTS BY BOTH MULTIPLE-PRESSURE AND SCARIFICATION

Ordinal position of vaccinations	No. of vaccinations	Number of takes			
		Total	By multiple pressure	By scarification	By multiple pressure and scarification
First ..	100	83	79	63	59
Second ..	17	8	7	1	0
Third ..	5	0	0	0	0
Total ..	122	91	86	64	59

TABLE II—DISTRIBUTION OF SINGLE TAKES IN A HUNDRED INFANTS VACCINATED BY BOTH MULTIPLE PRESSURE AND SCARIFICATION

Ordinal position of vaccinations	Single take	
	By multiple pressure only	By scarification only
First	20	4
Second	7	1
Third	0	0

Results

The general results show that a primary take by multiple pressure is equal in size to that of a $^{1}/_{4}$ in. scarification, though the area of epidermal rupture appears so much smaller (fig. 2). The normal progress of vaccination is slightly slower by multiple pressure, particularly up to the seventh day. There seems to be no significant difference in the local reaction around the primary take in the two methods, and neither method gave rise to a generalised reaction in this series. Sepsis has always been rare in this clinic, and in this series of 122 vaccinations by both methods only 1, by scarification, became mildly infected.

The results (tables I and II) show definitely that multiple pressure is a successful method. In this series it was superior to scarification as regards the number of both successful primary takes and successful revaccinations. Of the 83 primary takes 79 were by multiple pressure, including 20 by multiple pressure only, and there were only 4 takes by scarification which were not accompanied by takes by multiple pressure. The 17 infants in whom both methods failed on the first attempts were revaccinated by both methods, leading to 8 takes, 7 of which were by multiple pressure and only 1 by scarification. Altogether 5 of the 9 infants in whom both methods failed on the second attempts were revaccinated by both methods a third time but none was successful.

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Mineral Oils in Food

Two Sheffield confectioners were fined last week for making jam tarts with mineral oil instead of vegetable or animal fats. The *Manchester Guardian* (Dec. 6) *reports that one confectioner said that* he had used purified paraffin, which formed a third of the fatty matter in his tarts; the other had used petroleum jelly, which comprised 96% of the fatty matter.

Committee on Medical Nomenclature and Statistics

This committee has been appointed to advise the Registrar-General on questions affecting the International Statistical Classification of Diseases, Injuries, and Causes of Death, and any other matters concerning medical nomenclature or statistics which may be referred to it. The members are:

Sir ERNEST ROCK CARLING, F.R.C.S., F.R.C.P. (chairman), Sir ALLEN DALEY, F.R.C.P., K.H.P., medical officer of health and school medical officer, London County Council; ERNEST FINCH, F.R.C.S., emeritus professor of surgery, University of Sheffield; F. H. K. GREEN, F.R.C.P., assistant secretary, Medical Research Council; C. F. HARRIS, F.R.C.P., dean of the medical college, St. Bartholomew's Hospital; A. BRADFORD HILL, D.SC., professor of medical statistics, University of London; A. J. LEWIS, F.R.C.P., professor of psychiatry, University of London; ARTHUR MASSEY, O.B.E., M.D., chief medical officer, Ministry of National Insurance; P. L. MCKINLAY, M.D., superintendent of statistics, General Registry Office, Edinburgh; W. C. W. NIXON, F.R.C.O.G., professor of obstetrics and gynæcology, University of London; W. N. PICKLES, M.D., general practitioner and M.O.H. for Aysgarth, Yorkshire; A. H. T. ROBB-SMITH, M.D., Nuffield reader in pathology, University of Oxford; PERCY STOCKS, C.M.G., F.R.C.P., chief medical statistician, General Register Office; R. E. TUNBRIDGE, O.B.E., F.R.C.P., professor of medicine, University of Leeds; Sir LIONEL WHITBY, C.V.O., M.C., F.R.C.P., regius professor of physic, University of Cambridge; ALBERTINE WINNER, M.D., medical officer, Ministry of Health; and L. M. FEERY, General Register Office, (secretary).

Notification of Infectious Diseases

ENGLAND AND WALES

Disease	Week ended Nov.			
	6	13	20	27
Cerebrospinal fever	21	33	32	36
Diphtheria	171	159	154	141
Dysentery	55	133	49	72
Encephalitis lethargica	..	2	..	1
Measles, excluding rubella	6177	6910	6923	8547
Ophthalmia neonatorum	42	45	36	43
Paratyphoid fever	3	8	4	1
Pneumonia, primary or influenzal ..	496	579	732	710
Polioencephalitis	2	3	6	5
Poliomyelitis	73	60	46	42
Puerperal pyrexia	106	92	100	82
Scarlet fever	1471	1450	1835	1544
Smallpox	..	..	..	..
Typhoid fever	4	5	9	3
Whooping-cough	2240	2481	2680	2747

In England Now

A Running Commentary by Peripatetic Correspondents

THE Memorandum on Mental Health Statistics ju issued by the Ministry of Health should prove a sour of great comfort to those who have to compile the Such comfort will derive not only from the optimis use of the word *Health* in the title, rather than the wo *Ill-health*, but also from the evidence therein of t care and helpfulness with which our administrators a watching over our work. Our awareness of this ca developed into gratified amazement as we studied t 12 typed foolscap pages of instructions drawn up help us fill in a natty little record sheet arranged in t familiar box formation.

When we have completed part IA (boxes 1 to 2 we are told that there should be an entry in every bo except that:

22 (Patient related by blood to first spouse)
23 (First spouse's mental state) .. ..
27 (Age at and duration of first marriage) ..
28 (Age of first wife at marriage to patient)
29 (Married more than once) .. .. ..
Should all be blank if the pati has never mar

Furthermore, 27 (Age of first wife at marriage to patie *should be left blank if the patient is a female*; a sim little hint which will readily appeal to all.

In part B the good intentions revealed by the ab excerpt are combined with tact and delicacy in remark that box 36 (Address to which patient l *should be left blank if the patient has died*; and w adaptability to changing circumstances in box 37 (Ca of death; was a P.M. performed?) *which*, we are inform *should be left blank when the patient has not died.*

Great Stuff as this undoubtedly is, it failed to enth the perfectionist member of our staff, who mer remarked acidly that the Ministry had omitted mention that the whole form, part I, II, and III, A, C, and all, should be left blank if it should beco apparent that the patient never had existed.

It may be ungrateful to cavil at an attempt to produ foolproof statistics, but we could not help asking o selves whether a fool would read and understand tw *pages of instructions; especially as, if typed on fool* they may well prove to be above his head.

* * *

All the windows in the laboratory were shut, b nevertheless the fog had managed to creep in, maki the staff sniff and cough as they met for afternoon te The professor cleared his throat partly for the same rea and partly as a signal that he was about to hold forth

“ 'Tis somewhat ironical,” he said, “ that these de fogs of ours are due to fine weather not merely elsewh —the North Sea or the Continent—but also above o very heads. They develop round the fringe of an an cyclone and are caused by an inversion of the te perature of the air. Normally, the higher one flies t colder, but in fog-producing conditions something h happened to the adiabatic lapse-rate, the upper air warmer, and the cold air at ground level, together wi the smoke there produced, is prevented from risin Hence the murk.

“ Twenty years ago the London fogs were mu blacker, because more coal and less electricity wa used; and fires were lit in the streets to warm the a so that it could rise and take the fog away with i FIDO was invented for military purposes, but it far too expensive for ordinary civilian use. Obvious some device is required by which the warm air above ca be brought down to ground level, from which it w promptly rise again. It's a wonder nobody has invente one.”

“ It's funny you should say that,” said the psychiatris “ *because only today my pet* altruistic paranoiac brough me a sketch showing how to do this. The essence of th scheme, you will all observe, is a pilotless aircraft electron cally controlled to fly a circle of given radius at a pre determined height selected after consultation with th meteorological office. This aircraft carries a jet apparatu by which the warm air is sucked in and pumped dow an airtight hose or tube anchored to the ground throug a ball-and-socket joint. From this point on the groun the warm air is distributed to any desired distanc through radial pipes, which can be left permanently position. Where the air leaves the pipes upward currents are immediately formed. All you want besides is an open space. Almost any London park would do. And course the same arrangements could be used for nding us cold air in a heat-wave. Indeed the only roblem that remains to be solved is what to do with aircraft and pipes when there are no heat-waves or s. Any ideas ? ”

“ Pneumatic delivery of telegrams ”—“ Collection of lvage in the reverse direction ”—“ Irrigation of flower-ds in the parks ”—“ Free distribution of ices in summer d hot dogs in winter ” (this from the lab. boy)—ggestions hurtled through the foggy air. “ But those n't employ the aircraft,” objected the professor ; d he rose and placed his empty cup and saucer on a le of petri dishes as an intimation that it was time to t back to more serious matters.

* * *

Your comparison of two reference systems shows that ither can overcome the disabilities imposed by unselec-ve authors and permitted by inattentive editors.

* * *

Therapy Through Interview [1] shows what could be done y the likes of you and me had we only the requisite gour and enterprise and lived in the States. It is an trancing book of dialogues to which, for sheer human terest, those of Plato can't hold a candle. Take, for tance, the story of Joe told in eight racy episodes : e has an ulcer ; Parents (you might have guessed t they had something to answer for) ; Joe's History : e enters the Second Phase of Therapy (not to be nfused with Captain Shotover's seventh degree of ncentration) ; Joe makes Progress ; Joe Ends the cond Phase ; Joe Tries it Just Once More (meaning ychotherapy) ; and lastly Joe's Separation (from the ron strings of the psychiatrist, that is ; not from his fe).

The hero of the book is You, a small-town physician o, as a sideline, gives psychiatry a whirl. What is rticularly satisfactory about Joe's case is that he came You in the first place because Dr. Brown, a mere atic but none the less a keen competitor of Yours, patience with him. At the end of it all Brown n't have it that You cured Joe by mere talk. “ If u've got something new for ulcers and don't let me on it, You and I are no longer friends,” he says. Con-ed at last, Brown actually offers to hand over to You uple of neurotics, being himself too busy to try the hiatric stuff.

l's story (Bill and his Father were Buddies) is hardly impressive than Joe's. You got him round the ner and soon had him going fishing trips with Joe. ly's Heart Trouble was the merest chicken feed ; but ou fell down on Gloria, who proved too tough a nut You to crack ; she was a real high-class psycho-eurotic. However, You were soon up and coming again d brought home the bacon all right in the case of Donald, who got a fracture falling off a stolen bicycle what a moral the Victorians would have drawn from that) and still more in the case of Harvey, a nasty boy who exposed himself in public because his parents had put him wrong about Sex.

Now and again the question of Your fees and whether You are worth the outlay, crops up during interviews, and You are acutely aware of the competition of other physicians, not only in Your Town but also in the Big City, all selling therapy of one sort or another and ready to pounce on any patient of Yours with whom You fail. Indeed, Yours is a stimulating life if You don't weaken ; and of course You don't. The Big Day when You decide to quit general physician in the mall Town, migrate to the Big City and commence psychiatrist.

You have got there.

* * *

Your newest peripat, a primigravida of 28 weeks' duration, is at last finding the teaching of Mr. Blank, learnt the hard way as his house-surgeon, coming into its own. His special continuous suture is invaluable for finishing off the woolly parts of a layette.

Letters to the Editor

THE UNIVERSITIES AND THE HEALTH SERVICE

SIR,—Professor Dible in your issue of Nov. 27 makes many statements with which one can agree entirely : professors usually are appointed for the reasons he gives, but are nowadays overloaded with administrative responsibilities ; these “ extramural ” (if one may use the word) responsibilities have crowded out his proper academic responsibilities to an increasing extent since July 5 ; and the Spens report has raised salary problems of national importance. But there are points which might be regarded differently.

Between June, 1947, and August, 1948, of 160 vacancies in non-clinical (excluding premedical) departments, 62 (39%) were unfilled. To 17 vacancies medically unqualified personnel were appointed (comprising 13 in biochemistry and 4 in anatomy or pathology). Of the remaining 81 posts (to which medically qualified individuals were appointed) in 30 there was only one applicant. The mass of the present professoriate of the faculties of medicine in Great Britain are, like Professor Dible, men and women who have elected to work in the less lucrative branches of the profession for the interest of the work. But it is also clear that there are not enough idealists coming forward to meet the requirements of the academic side of the profession under modern conditions. The increased demand is not because of the National Health Service alone, but largely because of the expansion of necessary knowledge and the increased subdivision and specialisation of the older branches of medicine. Put briefly, the past financial directive towards clinical branches of medicine has imposed hardships which have been accepted by idealists. Now, however, the increased directive arising out of Spens plus the post-war cost of living is so impairing recruitment that we are extinguishing our laboratory departments.

There is, however, a much more important matter raised by Prof. Dible out of the two passages :

> “ certain medical professors have . . . to carry a burden of responsibility for the care of patients, or for the whole gamut of modern clinical diagnostic tests, or for the provision of a post-mortem service to a hospital.”
>
> “ For myself, however, the position is clear. If a choice is to be made between on the one hand, the large financial gains offered to hospital specialists, with which must be coupled the conditions of service under the Ministry of Health, and on the other the status and emoluments of a professor with the traditional freedom and privileges of that office, even at a much lower salary, I should not hesitate to accept the second.”

A whole-time member of a university staff cannot work for more than 24 hours a day. His official working hours are fixed, but they are all the same whatever the post. University duties are teaching and research. Therapeutic responsibilities are properly not university ones but are now clearly National Health Service duties. In so far as these are performed in university hours they should be remunerated proportionately by the Ministry. But there is no good case for the residual university portion of the time being remunerated at any greater rate in any one department than another. An authoritative anatomist is as much entitled to his “ hire ” as an authoritative surgeon is for his hire in surgery so far as the dual duties of teaching and research are concerned.

In fact the complexity of directing and conducting research with many workers on a departmental staff is as great a problem for the professor of physiology or anatomy as for the professor of pathology or surgery. The problems are equally difficult of correct solution, and, if efficiently tackled, have equal biological disregard for timetables, vacations, and weekends. There is even a case for increased salary in the non-clinical subjects since the non-clinician is often a D.SC. as well as a medical man ; he is often doubly qualified, medically and scientifically.

I am not a lover of the principle of “ hard-lines pay ”—namely that the laboratory worker in the clinical years deserves extra salary because he has so much work to do in treating or diagnosing patients that he has no time for research that would receive academic awards. If he wants to do research, he organises his establishment and his staff so that no-one has an excess of N.H.S. routine and everyone has adequate time for academic university work of teaching and research. In fact the man who pleads hard lines is worthy, in university terms, of salary deprivation rather than increases.

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[1] By Dr. Stanley G. Law, of the Minnesota Psychiatric Institute. London and Toronto : McGraw Hill. 1948. Pp. 313. 27s.

There is, of course, the strongest possible case for equality of university salaries in all faculties: each man is an authority in his own subject, more he cannot be: Lascelles Abercrombie, Gilbert Murray, Sherrington, Osler, Hopkins, Le Gros Clark, Rutherford, Robinson, are equals, not interchangeables.

The problem before the University Grants Committee to which Professor Dible refers is the problem of reward for extramural work in the N.H.S., when encroaching on university time and duties, and also the problem of maintenance of a qualified university staff in the faculty of medicine when they are attracted by outside interests of guaranteed high salaries without the adventure and gamble of free-lance business. This of course exists in other faculties.

St. Mary's Hospital Medical School, London, W.2. **A. St. G. Huggett.**

Sir,—Professor Dible raises important and controversial points, but does little to suggest a solution. A possible conclusion to be drawn from his article is that the universities should have little if anything to do with the health service—that no possible benefit could accrue to them. Surely this is a defeatist attitude, which from a purely practical point of view could only be considered in the case of such subjects as pathology and bacteriology. It is hard to believe he advocates that the professors of medicine, pædiatrics, surgery, obstetrics, and psychiatry should do no clinical work in their own field. That would herald a return to the medicine of the Middle Ages—a barrier of suspicion between the academic and the practising man. Those of us who recently served in the Forces discovered that the ideas of the laboratory are difficult to transmit to the man in the field and vice versa. With rare exceptions such transmission is successfully done only by a man experienced and active in both fields. This is equally true of civilian medicine.

In the past the professors and many of non-professorial rank in clinical subjects have been members of hospital staffs. Under the National Health Service the fundamental difference is that the Minister of Health and his Scottish counterpart have decided that those undertaking hospital work should be paid for it. The payment for hospital work does not mean that the person paid must undertake more hospital work than he did in the past, or serve on innumerable committees. The opinion or advice of a laboratory worker or clinician will often be of value to committees, but this surely does not mean that the only possible person to give such help is the professor. The wise professor would delegate some of his authority so that he did not become overburdened by routine clinical work or attendance at committees. Mr. Churchill in his conduct of the recent war showed how superbly this could be done.

Professor Dible is on sure ground when he states that excessive administrative appointments are productive of verbiage in the form of long memoranda and reports. Associated with this is the excessive use of standing committees. For example, in the Act provision is made for each region to set up a medical education committee. In the regions based on a university this would be a duplication of a committee already in existence—the medical faculty, whose chief if not only concern is medical education. It is probable that other duplication may occur, and in that case the universities might well suggest how some existing committee could fulfil a dual function.

Leaving aside the financial problems which have already received much publicity, there are many ways in which the universities and hospitals can benefit by a close linkage and mutual sharing of staff. Sir William Osler believed in a quinquennial brain-dusting; and there is provision for this in some at least of the temporary contracts issued by regional boards. It is up to the universities to see that their staffs have such a brain-dusting, and up to the professors to see that they are not so overburdened with routine as to have no time for reflection and experiment. This is no time to shrink from responsibility, and provided the universities are ever on the alert there seems no reason why they should not coöperate in every possible way with the regional hospital boards to keep British medicine in the forefront of world medicine.

Medical School, Dundee. **John Grieve.**

THE GENERAL PRACTITIONER

Sir,—May I say a word about the plight of the would-be general practitioner? In order to start his practice he must obtain two things—a house and the consent of the local executive council. If he manage to obtain a house he has to sit and wait for the decision of the executive council. This may take up to 3 month or more, and only when the word "go" arrives can h put up his plate and prepare to receive patients. Hi first cheque appears at the end of the quarter, which means that 4–6 months have elapsed before any incom is obtained. Judging from the comments of establishe general practitioners, this cheque will probably pay one month's rent on his new house.

Suppose, on the other hand, that after the 3 months wait the executive council refuse to permit him t practise. He appeals to the Minister, who upholds th council's decision. So at the end of, say, 4 months ou hero—for that is what I think we must call him now—finds himself still unemployed, with a house he does no now want and the prospect of going through the enti procedure again in another district.

The only work for which a general practitioner suited is general practice. If this is denied him he mu remain not only unemployed but also—and especially he is over 35—unemployable. Assistantships postpo but do not solve the problem. Incidentally the tim interval of 3 months may be an underestimate. I hav so far waited almost 14 weeks, and my letter of inqui to the executive council written 5 days ago has not y produced a reply.

I suggest the solution is to be found in the penultima paragraph of your leading article of Dec. 4—namel an increase in the capitation fee and limitation of doctor lists to provide more openings for new entrants t practice. This would enable executive councils to arriv at a decision after somewhat less lengthy deliberations.

London, N.W.10. **Daniel Feldman.**

YOUNG SPECIALISTS IN SEARCH OF A JOB

Sir,—"The need is twofold, more specialists and a better distribution of them." So said the white-pape which preceded the publication of the National Heal Service Bill. The Hospital Survey (Sheffield and Eas Midlands Area) published in 1945 got down to details:

> "One of the most striking points arising from our surve is the inadequacy of the numbers of available consultant In Sheffield, not only is the number of consultants to small for the town itself, but the problem is made eve more difficult because these consultants visit a large numbe of hospitals within a radius of twenty miles and cannot b reason of their numbers give the desirable amount o attention to all."

The same report explained why there were too few specialists:

> "The number of consultants in any area has necessarily been determined hitherto by the amount of available private consulting practice by which they live."

Its conclusion for this region was:

> "In general terms it may be said that consultant staffs could be at least doubled and there is especial need for physicians and the adequate development of 'medicine.'"

The Hospital Surveys for the other regions came to similar conclusions.

Since July 5 the number of advertised appointments for whole-time or nearly whole-time surgeons and physicians has been disappointingly small. In spite of assiduously studying the advertisements in The Lancet, I have noticed only one vacancy for a surgeon and one for a physician in this region since July 5. Surely it is time that some sort of establishment programme was formulated, preferably centrally and right away from any possible local "interests." It might be decided, for example, that the normal establishment should be approximately one full-time surgeon and one full-time physician for every 40,000 of the population. The regional hospital boards and boards of governors should then be asked to staff up to this level as quickly as possible and thus help to remedy the obvious defects in the specialist services so clearly revealed by the hospital surveys.

CRITIC.

MULTIPLE ABDOMINAL CATASTROPHES

SIR,—I should like to congratulate Mr. Glaser on the successful result in the case described in your issue of Nov. 27. *Both the patient and the surgeon must have* had great courage and staying power.

I was particularly interested in his method of dealing with intestinal fistulæ by a dressing with adequate protein. carbohydrate, and fat so as to use up the enzymes in the succus entericus and thus prevent the skin becoming sore. I have not used this method myself but certainly intend to try it on a case under my care at present. I would strongly recommend. however, the use of continuous suction for treating intestinal fistulæ. An apparatus can quite easily be set up so that the intestinal contents are immediately sucked away and no appreciable quantity of them remains in contact with the skin. Should Mr. Glaser have another case of intestinal fistula I would suggest that he should combine suction with his *method* of dressing. The frequent *renewals of the* dressing to which he refers would not be necessary if suction were used, since the bulk of the fluid would be sucked away.

London, W.1. JOHN HOSFORD.

CANCER AND RADIOGRAPHIC MUSEUMS

SIR,—Much of the ignorance among general practitioners about the possibilities of radiography is due to there being no place where a fully representative collection of radiographs can be viewed. When the G.P. knows what is suitable for this form of diagnosis, the radiologist will have far less unsuitable material to deal with.

Many hospitals have *museums*, but these are one-sided, containing films only. The chief object (as yet unattained) of my book *A Descriptive Atlas of Radiographs* was the establishment of such museums. So far as I am aware, no such exists anywhere in the world, the nearest approach being the Wellcome Museum of Medical Science, Euston Road, London, W.O., where radiographs are given the necessary background of clinical notes, specimens. photographs, and microscopical slides. Yet this does not profess to be a radiographic museum.

The ideal radiographic museum would be a place where the common, and therefore important, diseases are depicted. Rarities, save congenital ones, would be shown sparingly. The museum should show routine radiographs since these are the ones which the G.P. encounters; perfect radiographs defeat their object. Films alone should be used in making the original diagnosis, since there is considerable loss in definition in *making the print—e.g., loss of skin contour, necessitating* silhouette process. But the fact remains that the G.P. likes to see bones and opaque meals as opacities rather than radiolucencies. The ordinary photographic film is a poor thing compared with the print. Prints are much easier to display than negatives, which require viewing-boxes for their display. Reduced prints are a necessity owing to the small amount of space available. They are quite satisfactory; unlike publishers' blocks they show a minimum loss of definition and may, with advantage, be magnified with a lens.

A hall at least 60 by 40 ft. is required; and even then special features have to be adopted so that all the pictures may be at eye level. The first essential is the provision of "photoboards" consisting of sheets *of three-ply wood or of duralumin 5 ft. square hung* from roof girders 10 ft. high. These boards have ledges to take half-plate reductions; each board accommodates twelve horizontal rows of 8 half-plate radiographs, making 96 for each side. Thus 15 photoboards would accommodate nearly 3000 radiographs. The prints are mounted on aluminium sheets, a layer of paper separating the print from the metal, the whole being bound by passe-partout, with a tag permitting easy removal. Mounted on ledges, each could be taken out easily for closer inspection. They would be slung at right angles to the room so as to form bays each lighted by a vertical window. The window sills would be used to house specimen-jars, models, &c., appertaining to the radiographs. A chain (thrown over the roof girder) would *permit the board to be raised or lowered so that the* pictures could be seen at eye level.

A knowledge of the normal is imperative; therefore radiographs of such are mounted on photoboards and placed on an easel. The easel consists of two stout uprights secured on a 3-ft. base with metal stays or heavy timber. Two photoboards are slung from the top bar so as to counterbalance one another. They resemble a guillotine, the boards being the knife, moving upwards and downwards so that the radiograph under examination is at eye level; guides are provided to keep them straight. If the easel is likely to be moved from room to room, the uprights are cut in the middle and fitted with hinges and long bolts. By using both sides of the photoboards nearly 400 reduced prints can be displayed.

Another means of displaying the normal is on a hexagonal or octagonal roller, such as shops use for picture postcards, but lying on its side with its axle supported on a 5-ft. trestle. Such a drum, 5 ft. long, would accommodate 48 or 64 reduced prints. (I am grateful to Mr. R. E. S. Ramsay, D.A., for preparing these scale drawings and for useful suggestions.)

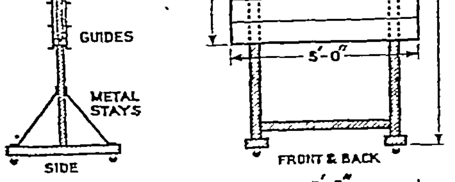
The inclusion of the name "cancer" in the title of these museums should aid in their financing. A special cancer section would be devoted to pictures and specimens of skin cancers and the results of treatment. Internal cancers would take their place in the main body of the collection of radiographs.

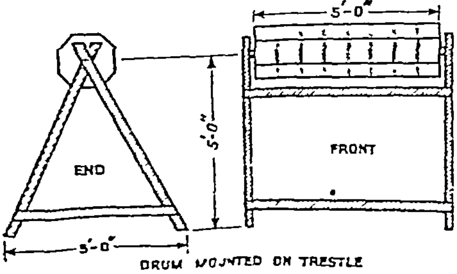
A historical section would show types of early apparatus. It is surprising how this apparatus is being forgotten in the mass of beautiful apparatus being turned out by the manufacturers.

A canteen at first sight appears to be ridiculously unimportant, but this is not so. Often more knowledge is shared over a quiet cup of tea than is gained from a lecture. Hospitals providing tea are more patronised by postgraduate students than others which do not.

Conclusion.—The creation of radiographic museums at the teaching hospitals is urgent. For smaller hospitals, often giving much postgraduate teaching, they would form useful centres of culture where men could meet and where lectures or, rather, discussions could take place.

Maxwelltown Dumfries. A. P. BERTWISTLE.





DRUM MOUNTED ON TRESTLE

ENTEROGASTRONE

SIR,—In last week's annotation you observe that treatment of peptic ulcer with enterogastrone has proved wholly disappointing. May I give some reasons why this was easy to foresee? Enterogastrone is obtained by the oily extraction of duodenal mucous membrane, and the rationale of its use is based on the observation that it has the same effect as fat in inhibiting gastric secretion and delaying gastric emptying. For the achievement of this effect, which still appears to be the sole consideration in the approach to the problem, would it not be more logical to administer fat itself rather than the result of its metabolic stimulation?

That enterogastrone is not alone in its specific action on the functions of the stomach is shown by urogastrone which has similar effects. Furthermore, the existence of an inhibitory motor reflex of the stomach—the "enterogastric reflex"—mediated almost entirely by the vagus was postulated by Thomas and Mogan.[1] Day and Webster[2] have shown that the introduction of even neutral fluid into the duodenum inhibits gastric secretion, while Thomas, Crider, and Mogan[3] observed that not only hydrochloric acid, hypertonic salt solution, or alcohol, but even chemically inert materials, when introduced into the duodenum inhibited the movements of the stomach. There appears to be no specific reaction for fat, the only difference between the effect produced by these substances being the duration of the reactions, which is longest for fat. Finally, may I point out that the ulcers produced in Mann-Williamson dogs have yet to be shown to be relevant to the problem of peptic ulceration in the human.

London, W.1. J.-JACQUES SPIRA.

A WALKING-CHAIR FOR SPASTIC CHILDREN

SIR,—The appliance for the training of spastic children described by Mr. Wrightson in your issue of Nov. 20 is one which might have a much wider field of usefulness in rehabilitation.

As suggested by Mr. Wrightson, the appliance, which might be described as a "travelling gantry," has the merit of providing a mobile support for a predetermined proportion of the body-weight, and because of this it may be expected to give confidence to an insecure patient. Its value, then, is clear in those cases where, after accident, operation, or illness producing local or general weakness or incoördination of muscles, full weight-bearing is undesirable, but in which the mental picture of normal movement is undisturbed.

In the case of spastic children, however, a normal movement pattern in the brain has either never been formed or has been destroyed, and the major problem in treating these cases is the establishment of such a pattern. This can be done only by painstaking concentration by patient and therapist on the production first of movements at single joints and then by the synthesis of these movements into patterns which can be utilised by the child for progression.

The "gantry" may well get spastic children walking sooner than they otherwise might. But the therapist must realise that the apparatus is introduced to reduce the strain on her own musculature rather than as a form of treatment for the child; otherwise the grotesque gait which is so characteristic of the untreated child will certainly result. That the aim is *normal walking* must not be forgotten. I feel that this point, which was not stressed by Mr. Wrightson, is fundamental.

Middlesex Hospital,
London, W.1.

W. F. DUNHAM
Assistant,
Department of Physical Medicine.

SIR,—The apparatus described by Mr. Wrightson, though ingenious, involves perpetuation of acquired deformity and implies a belief that in these cases ordinary motor behaviour can be gained by persistent practice.

This apparatus and the more elaborate model now being designed might indeed be valuable in conditions where the cerebral pattern of movement is undisturbed and it is desirable to avoid or minimise weight-bearing but the treatment of spasticity and allied disabilitie of cerebral origin with such an instrument betray acceptance of a disability which, in fact, responds t careful training directed to the creation of correct moto patterns and normal skeletal postures.

Such an apparatus defeats its own ends by causin a child with defective motor ability to "walk" whil retaining poor skeletal posture due to his inability t move normally, and by further distorting that postur (and action) through motion which ignores his moto dysfunction. Further, fear of falling may be eliminate while mechanical protection lasts; but surely th inventor of this machine does not visualise it in use a over the country wherever our thousands of cerebra palsied children and adults happen to live.

Attention is perhaps better directed to prevention skeletal deformity and the acquisition of correct mot patterns, to enable handicapped children to dispens entirely with mechanical devices and to protect them selves against fear of falling by developing independe stability and motility. Early and effectively treate "spastics"—without being specifically taught—wal and perform all other normal functions while they a being trained to compensate for their defective mot ability. Of course in the occasional cases with an add mental disability satisfactory treatment is preclude and there may then be a place for this device.

EIRENE COLLIS

Queen Mary's Hospital for
Children, Carshalton.

Chief Therapist, Cerebral Palsy
Research and Diagnostic Clinic.

HOSPITAL BIOCHEMISTS

SIR,—The letter from "PH.D." last week raises a po of great importance to professional biochemists. T advertisement to which he refers, offering £1500 p annum to a medical graduate with experience in bi chemistry, but only £750–1000 to a science graduat is not an isolated case. Several advertisements in simil terms have recently appeared.

If discrimination of this nature is to become part the policy of the National Health Service it can on result in friction and dissatisfaction. The biochemi who has chosen biochemistry as a career from the com mencement of his training will find himself workin among colleagues who are all paid at a much highe rate than himself, which can hardly fail to lead t unhappiness.

Hospital biochemists sometimes suffer from othe forms of discrimination of a humiliating character. is not uncommon to find that the most junior and recent appointed member of the medical staff is asked to ser upon committees, in the work of which the biochemi has never been invited to participate. This might b interpreted as evidence that the professional, or eve social, status of the science graduate is regarded as low than that of his medically qualified friends.

M.SC., PH.D.

LOCAL TREATMENT OF BURNS WITH A DIAMIDINE

SIR,—The experience of Dr. Kohn and Dr. Cross wit a diamidine, 'Dibrompropamidine' (M. & B. 1270 reported in their article of Oct. 23, corresponds to m own in the treatment of burns with this substance. have used this compound in 10 cases of burns which though not extensive, were severe enough to requir admission to hospital. All the patients were nursed i general wards and received local applications o M. & B. 1270 up to the time of skin-grafting.

On admission the treatment of shock was the primar consideration. Various dressings had been applie before admission—penicillin cream, M. & B. 1270 cream or saline or dry dressings. In the ward local applicatio was made of 1% M. & B. 1270 in either the base devised by Todd[1] or a carbowax water-soluble base (see table There is evidence that Todd's base inhibits the action of this diamidine. With the second base burns dry more rapidly and dressings tend to adhere to granulations.

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1. Thomas, J. E., Mogan, C. J. *Proc. Soc. exp. Biol., N.Y.* 1931, 28, 968.
2. Day, J. J., Webster, D. R. *Amer. J. Digest. Dis.* 1935, 2, 527.
3. Thomas, J. E., Crider, J. O., Mogan, C. J. *Amer. J. Physiol.* 1934, 108, 683.

1. See Clark, A. M., Colebrook, L., Gibson, T., Thomson, M. L. Foster, A. *Lancet*, 1943, i, 605.

The preparation was applied to burns without any minary cleaning, and was left untouched until the ent's general condition had improved. Dressings were then changed, in the ward, 2–3 times a week by a nurse who observed aseptic precautions. If the burnt area involved joints, exercises and dressings were done in a saline bath, a physiotherapist supervising the exercises.

Cause, burn or scald	Depth and extent (%)	Region	Organisms cultured	Treatment* and result
S.	Superficial and deep 10	Face, neck, back	*Staph. aureus*; *Staph. albus*	A. Skin graft, 2 weeks; healed, 4 weeks; full function
S.	Superficial 15	Face, neck, both arms	*Staph. albus*; non-hæmolytic streptococci	AS. Healed, full function, 6 weeks
S.	Superficial, with small area deep 20	Both arms, face, neck	*Staph. aureus*; non-hæmolytic streptococci	AS. Healed, full function, 6 weeks
S.	Superficial 10	Rt. abdomen, chest	*Staph. aureus*	A. Healed, full function, 2 weeks
S.	Superficial 5	Forehead, lt arm	*Staph. albus*; hæmolytic streptococci	A. Healed, full function, 3 weeks
S.	Superficial 10	Lt arm, lt hand	*Ps. pyocyanea*	A. Healed, full function, 10 days
B.	Superficial and deep 15	Lt arm, hand, lt leg	*B. coli*; *Proteus*	AS. Skin graft, 4 weeks; slight residual stiffness in lt hand; fair function
B.	Superficial 7	Both hands, lt forearm	None	A. Healed, full function, 10 days
B.	Superficial 10	Rt face, rt leg	*Staph. aureus*	A. Healed, full function, 4 weeks
S.	Superficial 10	Face, neck, lt arm	None	A. Healed, 8 days
B.	Superficial 10	Face, lt arm	None	A. Healed, 1 wk; full function
B.	Superficial 15	Face, legs	None	A. Healed, 10 days; full function
..	Superficial 5	Lt foot	*Staph. aureus*; *B. coli*	A. Healed, full function, 3 weeks
S.	Superficial and deep 20	Back, neck, lt arm, lt leg	*B. coli*; *Proteus*; hæmolytic streptococci; *Staph. albus*	B. Split skin graft to neck, 4 weeks
S.	Superficial 10	Rt leg, rt arm, back	Hæmolytic streptococci; *Staph. albus*	B. Skin graft to back, 16 days
S.	Superficial and deep 15	Both legs	*Staph. albus*	BS. Skin graft, rt leg, 3 weeks
S.	Superficial and deep 20	Both legs, abdomen	*Proteus*; *Staph. albus*	BS. Skin graft rt leg and chest, 2 weeks
S.	Superficial and deep 5	Rt arm, rt hand	None	B. Healed, full function, 7 weeks
B.	Superficial and deep 10	Back, lt thigh, axilla	*Staph. albus*	B. Skin graft to rt leg and back: 1st, 5 weeks; 2nd, 8 weeks. Healed, 10 weeks. Full function

* A = M. & B. 1270, 1% in Todd's base. B = M. & B. 1270, 1% in carbowax soluble base. S = Saline baths.

Swabs for culture were taken at the first dressing and once a week thereafter. The organisms cultured were as follows: *Staph. aureus*, *Staph. albus*, *Strep. hæmolyticus N*, *Pseudomonas pyocyanea*, *Bact. coli*, and *Proteus*. It is thus evident that, in the concentration used, M. & B. 1270 will not completely eliminate either gram-positive or gram-negative organisms.

There were no deaths, and no cases showed significant evidence of infection. A few patients had slight pyrexia until skin grafting was undertaken. The average healing-time was 30 days, and with one exception full function was regained in every case.

Of the 19 cases, 7 were of deep burns requiring skin grafts. In every instance postage-stamp split-skin grafts were used. Grafts were made, on average, on the 22nd day, and healed, on average, by the 44th day. All grafts were 70–100% successful except one, the partial failure of which was due to inadequate fixation of the dressings. If the local application of M. & B. 1270 was used after successful grafting, the graft became soggy and healing was delayed; so from the time of grafting until final healing penicillin powder and tulle gras were applied. No toxic effects from local applications of M. & B. 1270 were observed, but a few patients complained of a slight stinging sensation for a short time after application.

Though there was little change in the bacterial flora in the first weeks after the burn, clinical progress was very satisfactory.

I wish to thank Messrs. May & Baker Ltd. for supplies of M. & B. 1270.

King Edward VII Hospital, Windsor. G. P. ARDEN.

CARCINOGENIC AND ANTICARCINOGENIC SUBSTANCES

SIR,—Professor Dodds in his remarkable review of this subject (Nov. 27) mentioned some work of mine on the treatment of breast cancer and its secondaries with testosterone propionate. He questions, however, the theoretical basis of the treatment, maintaining that the assumption that "a male hormone might possibly inhibit the growth of cells in the female body" is unwarrantable.

Excess of either androgens or œstrogens may in certain circumstances favour cancer development; and, though it sounds paradoxical, both may be anticarcinogenic. This explains the well-known beneficial effects of surgical or X-ray castration on mammary and prostatic cancer and is the basis of the stilbœstrol treatment of the latter condition, found by Huggins one year after I had published my observation on male hormone in mammary cancer.

The female/male hormone ratio in the blood and tissues may be an all-important factor. If this ratio is disturbed in favour of the female or the male hormone a *causa movens* for cancer development may arise, superimposed on a *causa remota*. The determination of the female/male hormone ratio in the body would give this theory a practical and more sound basis. An endocrine disturbance of the female/male hormone ratio occurs normally at the onset of the menopause (45 years) corresponding with the peak incidence of breast carcinoma. The second highest peak in the development of breast cancer is in the 60–61 years age-group at the very end of the menopause, when more androgen principles, as in every ageing woman, are elaborated in the adrenal cortex—the sexual gland of the ageing. Whereas at the beginning of the menopause there may be a preponderance of female principles with a carcinogenic action (here male hormone would be anticarcinogenic) at the end of the menopause the ratio may be disturbed in favour of the male hormone which acts carcinogenically (and here the female hormone would be anticarcinogenic, as indeed it is).

This may be an assumption—and here I agree with Dodds—though clinical experience confirms the theory in part, but there are certainly also some facts which speak in favour of the hypothesis. Male hormone slows down and inhibits, in massive doses, development of human endometrium.[1] One can exactly determine the amount of male hormone needed to neutralise the stimulating action of the female hormone; 25 mg. of testosterone propionate neutralises 0·5 mg. of stilbœstrol in the vaginal epithelium (ratio 50 : 1), and 600 mg. testosterone propionate neutralises 16 mg. of stilbœstrol in the endometrium (ratio 30 : 1)—which proves that male hormone in the female body has an action against cell growth. That is an undeniable fact.

No-one would claim that testosterone is a cure for mammary cancer (I recommended male-hormone therapy as a prophylactic method against secondaries after a total mastectomy). No-one would say that stilbœstrol is a cure for prostatic cancer, although it brings about very beneficial effects, just as testosterone does very often in mammary carcinoma.

Therapy with endocrines—and here again I agree with Dodds—is not an ideal one, but the results so far obtained surely confirm my assumption which Dodds considers "unwarrantable"; and the therapy should be still further tried until biochemists can give us the necessary anticarcinogenic tool.

London, W.1. A. A. LOESER.

CHANGING ENDS OF SOCIAL MEDICINE

SIR,—Your leading article last week reminded me of something I said in 1941 in my presidential address to the Welsh branch of the Society of Medical Officers of Health. Having described what had been done in the past and what it was still hoped to do in the development of our health and social services, I said:

> "But when we have finished it there will remain the greatest problem of all—the problem of man himself, who has it in his own power at any time to ruin his health and happiness however much may have been done for him by way of organising all kinds of social-welfare services for his benefit. Even for this problem there are optimists in our midst—the psychiatrists, the child-guidance experts, and the like—and we have a new kind of clergyman who is part psychologist and part minister. In days gone by we had debates on church versus science. In the new era, church and science must march together, labouring in harmony for the moral and spiritual as well as the material betterment of mankind. . . . Shall we this time have learnt the lesson that a vigorous social purpose shall inspire a community no less than the will to win survival?"

Cardiff. J. GREENWOOD WILSON.

RESPIRATORY OBSTRUCTION DURING ANÆSTHESIA

SIR,—Respiratory obstruction in general anæsthesia is common enough, but the following case seems to present some unusual features.

The patient, a boy of 13, was about to undergo an exploratory thoracotomy for congenital heart disease. Anæsthesia was induced with nitrous oxide, oxygen, and cyclopropane, using a Waters to-and-fro absorption technique. Induction was smooth as far as the second stage, when ether was added gradually. Mild laryngeal spasm resulted, but respiration was otherwise regular and the jaw muscles were well relaxed. At this point it was observed that the whole of the right side of the chest was immobile, whilst air was freely entering the left side. Prior to operation there had been no abnormal physical signs in the lungs. No pharyngeal airway had been used, nor had there been any noticeable secretion of mucus. During inspiration the intercostal spaces on the right side were seen to be drawn in. No mechanical explanation could be advanced for the complete failure of gases to enter the right lung, especially as there was no obstruction whatever on the left side. The head, which up to now had been turned over to the right, was then straightened and a Macintosh laryngoscope easily introduced. During this manœuvre the right side of the chest suddenly began to inflate as fully as the left. An endotracheal tube was passed and no further abnormality in respiration occurred throughout the operation. Convalescence was uneventful.

In the absence of any obvious cause of mechanical obstruction, such as a plug of mucus, it must be concluded that a reflex bronchial spasm was the explanation of the condition described. The precise moment at which the spasm started is not known as it was onl accidentally detected when the towels were remove from the chest. It would be interesting to know wheth any of your readers have seen any similar cases whic might throw light on the nature of the condition.

St. Thomas's Hospital, London, S.E.1. J. D. LAYCOCK.

THE MEDICAL CIVIL SERVICE

SIR,—You are, of course, correct in pointing out th only a small proportion of the weekly National Insuran payment is devoted to the National Health Servi That, however, does not really affect the point which wished to make—namely, that the average individ finds that he is paying some £10 a year in Natior Insurance, on which he may not live long enough enjoy a distant return in the form of a pension, wh his funeral, though paid for by the State, does not se to promise much enjoyment, the only obvious immedi benefit which he sees being his ability to call on the doct without further payment.

There is thus an inherent tendency in the system call on medical services for trifling ailments for whi previously the help of the chemist, or not even would have been enlisted.

While sharing Mr. Patey's general dislike of anonymi I would emphasise your editorial reference to the d of English literature to that well-known author, "Ano and to his close relative, the pseudonymous write e.g., Junius and Currer Bell; but, in this particu case, for reasons already stated, beg again to subscr myself

CHIRURGICUS.

DENGUE IN EARLY PREGNANCY

SIR,—I have recently seen a case where a Europe lady had dengue (a virus infection) during what prov to be the first month of pregnancy. The baby h now been born, and as far as can be told is complet normal and certainly is not deaf.

R. B. WADDY
Medical Officer of Health
Northern Territories.
Tamale, Gold Coast.

INDEPENDENCE IN RESEARCH

SIR,—I should like to comment upon some of t points raised by Sir Ernest Graham-Little in his lett of Nov. 20.

In the first part he is obviously advocating t "laissez faire" system in medical research. I am n a research-worker, but I should have thought that mo research-workers would prefer to work as members a nation-wide, coördinated team, rather than in isolatio very often unnecessarily duplicating each other's wor It seems to me that Graham-Little, and others who thi like him, are under the impression that freedom, includin freedom in medical research, means the "absence restraint." This is a fundamental mistake. Freedo comes through coöperation, together with restraint individuals which coöperation necessarily entails. T is true despite the obvious contradiction.

However, whilst I disagree with him on the organis tion of medical research, I do agree with him that t reference to research in the National Health Servi Act is meagre. What is more to the point is the actu Government expenditure on medical research compar with other Government expenditure—for exampl the expenditure of £1,173,000 on medical research con pared with the expenditure of £07,185,000 on militar science research over the same period, and compare with a total expenditure of £154,500,000 on Greece.

Graham-Little concludes with an attack on the Russi biologist, Lysenko, and makes the sweeping and inacc rate assertion that Lysenko's theories are universall rejected by authorities outside Russia. The Russia controversy in biology came to a head only a few month ago, and there has not been sufficient time for Lysenko' views to have had any effect, good or bad, on the econom of the country. One of the basic principles of scientifi work is the unity of theory and practice, and one o Lysenko's main criticisms of his biological opponent was that nothing practical had come out of their ideali theories, that their theories had not helped the Russi farmers one little bit. No doubt Lysenko's views will require modification in detail in the light of experience and further knowledge. The proof of the pudding is in the eating.

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[1] Loeser, A. A. *Lancet*, 1938, i, 373.

Huby, near Leeds. P. J. WADDINGTON.

Parliament

QUESTION TIME

National Campaign against Crime

Sir WALDRON SMITHERS asked the Home Secretary what steps he was taking to deal with the present crime wave; and if he would consider calling a conference of religious and political leaders to advise on further steps.—Mr. CHUTER EDE replied: Following the debate in the House of Lords, I have had a preliminary and informal talk with the Archbishop of York, and I am considering in consultation with the Minister of Education and others what practicable means there are of rousing the public conscience in this matter. Mr. WILSON HARRIS: Is the Minister satisfied that something effective can be achieved along these lines to deal with this unhappy situation?—Mr. EDE: I should not like to prophesy at this stage, but I hope that all men of good will, whether they are in the churches or not, will take steps to bring home to their fellow citizens the effect of the permanent lowering of moral standards in this country.

National Health Service

Sir HENRY MORRIS-JONES asked the Minister of Health whether, in view of many anomalies and some injustice, both to sick persons and those who had to minister to them, in connexion with the National Health Service Act, he would soon issue an interim report on the working of the Act.—Mr. ANEURIN BEVAN replied: I cannot accept the implications in this question. I am, of course, always ready to supply the House with whatever available specific information may be requested. Sir HENRY MORRIS-JONES: Can the Minister say when he hopes to introduce his amending Bill, and whether that Bill will deal also with some of the anomalies which are patent to everybody in the country, even if they are not patent to the right hon. gentleman?—Mr. BEVAN: The hon. gentleman has addressed his supplementary to an entirely different question. This matter of an amending Bill has been under discussion with the representatives of the medical profession and when full agreement has been reached, or when full agreement has not been reached, then the Bill will be presented to the House.

Mr. SOMERVILLE HASTINGS: Is the Minister also aware of the many expressions of satisfaction which have been received from all sections of the community; and does he agree that the thanks of the nation are due to the many people who are working the scheme?—Mr. BEVAN: When the time comes for the report of the Ministry of Health to be presented to Parliament, I hope that it will give an objective view of what has happened. It is undoubtedly the case that very many millions of people have already benefited under the Act. It is also noticeable that certain hon. members belonging to the Opposition claim in the country credit for things at which they jeer in the House of Commons.

Amendment of Lunacy Act

Mr. E. MACN. COOPER-KEY asked the Minister whether he was aware that under the provisions of the Lunacy Act, 1890, as amended by the National Health Service Act, 1946, a person could be seized and removed to a mental hospital against the wishes of the appropriate relative, but must be subsequently discharged on the direction of that relative, unless the patient was both dangerous and unfit to be at large; and what steps he was taking to correct this contradiction in the Act which is causing unnecessary distress.—Mr. BEVAN replied: The amendment effected by the National Health Service Act enlarged the powers of discharge. The operation of these provisions will be carefully observed with a view to obviating anomalies when amending legislation can be undertaken.

Mr. COOPER-KEY asked the Minister whether he was satisfied that the interests of the public and patients were sufficiently safeguarded by the provisions of section [illegible] of the Lunacy Act, 1890.—Mr. BEVAN replied: I am satisfied that in general the safeguards provided by the section in question are adequate. But in view of a recent case to which the hon. member has drawn attention, the point has been noted for consideration when amending legislation is undertaken.

Doctors' Remuneration

Sir ERNEST GRAHAM-LITTLE asked the Minister if he was aware of the severe hardships being suffered by doctors in all parts of the country as a consequence of inadequate remuneration under the National Health Service; and whether he would now fulfil the recommendations of the Spens Committee which would partially remedy this position.—Mr. BEVAN replied: No, Sir. The remuneration of general medical practitioners in the National Health Service is based on the recommendations of the Spens Committee and was agreed with the profession. I am aware that the initial distribution of the total amount of money made available is giving rise to some temporary difficulties, which I am discussing with representatives of the profession.

Inducement Fund

Sir ERNEST GRAHAM-LITTLE asked the Minister if he was aware that his directive to executive councils to the effect that it was not his intention that payments from the Inducement Fund should be made in cases where difficulty could be met by a fixed annual payment would, in fact, result in a general lowering of the capitation grant; and whether he would now withdraw this directive, and allow such payments to be met from the Inducement Fund.—Mr. BEVAN replied: I see no reason to alter these arrangements.

Emergency Dentistry

Mr. A. L. SYMONDS asked the Minister if he would issue a circular to local executive councils in the National Health Service asking them to arrange for dentists in the service to keep a certain time each day free from appointments so as to be able to deal with emergency cases.—Mr. BEVAN replied: I am considering with the dental organisations what can be done on the lines of this suggestion.

Medical Certificates for Eye-testing

Dr. SANTO JEGER asked the Minister whether, in view of the pressure of work on doctors, the long waiting in doctors' waiting-rooms, and the formal nature of the certificates involved, he would remove the necessity for patients requiring to have their eyes tested by opticians to obtain doctors' certificates saying so.—Mr. BEVAN replied: This requirement was instituted in the light of advice received from the medical profession and I should not feel justified in abolishing it except on professional advice.

Priority Spectacles

Mr. F. J. ERROLL asked the Minister what steps he was taking to ensure priority of supply for urgent cases, in view of the great demand for spectacles under the National Health Service.—Mr. JOHN EDWARDS replied: The Minister is seeking to ensure that the supply of spectacles shall be equal to the demand. In the meantime he hopes opticians will distribute their available stocks in the best interests of their patients.

Doctors' Bags

Sir WALDRON SMITHERS asked the Chancellor of the Exchequer if in view of the extra pressure of work placed on doctors under the new Health Act he would exempt from purchase-tax articles necessary for the use of doctors in their professional duties, especially the doctor's bag.—Sir STAFFORD CRIPPS replied: No, Sir. It would not be possible to give doctors special privileges for the few chargeable articles they use professionally.

Employment of Disabled

Replying to a question Mr. G. A. ISAACS stated that [illegible] people were registered under the Disabled Persons (Employment) Act, 1944 at Oct. 1, 1948. Of these, 72,975 were unemployed, including about 20,000 who had been unemployed for 12 months or over. The number unemployed included 10,990 classified as unlikely, owing to the nature and severity of their disablement, to get employment except under sheltered conditions. Of the extremely disabled, 1655 had already been placed in [illegible] sheltered factories and 88 were working in their own homes. There were 90 other factories under construction or being planned which were expected to absorb the balance of the disabled.

Housing for the Tuberculous

Mr. JOHN RANKIN asked the Secretary of State for Scotland what steps were being taken to deal with the housing of tuberculous patients in Glasgow.—Mr. ARTHUR WOODBURN replied: I understand that the corporation allocate 90% of new houses to families from overcrowded dwellings, of which 10% are allocated to tuberculous families. In addition, 400 permanent aluminium houses have been allocated to Glasgow out of the special programme of 1000 for areas where the incidence of tuberculosis is high.

Advisory Council on Child Care

Replying to a question Mr. EDE stated he had now appointed the following to the advisory council provided for in section 43 of the Children Act: Prof. Alan Moncrieff, F.R.C.P. (chairman), Lady Allen of Hurtwood, Dr. Muriel Barton Hall, Mr. R. Beloe, Miss S. C. Bertie, Mrs. F. M. Brown, Mr. P. B. Dingle, Mrs. K. W. Jones-Roberts, Mr. P. T. Kirkpatrick, Mrs. G. R. Morrah, Miss L. M. Rendel, O.B.E., and the Hon. David Smith. Departmental representatives of the Home Office, and the Ministries of Education, Health, and Labour had also been appointed.

Deaths from Bovine Tuberculosis

Mr. A. E. MARPLES asked the Minister of Health how many children died each year from bovine tuberculosis; and what evidence had he as to the primary causes of this disease.—Mr. BEVAN replied: About 450 die in England and Wales each year, usually infected by consuming raw milk.

Private Patients and Drugs and Appliances

Sir WAVELL WAKEFIELD asked the Minister of Health why a person insured under the Act who elected to remain a private patient of a doctor who was taking part in the State service was debarred from receiving pharmaceutical drugs and appliances free of charge under the Act.—Mr. BEVAN replied: Such a doctor would have no responsibility for observing the general conditions which govern prescribing at public expense.

Animal Experiments

Mrs. LEAH MANNING asked the Home Secretary whether he would consider introducing a special certificate for experiments performed on monkeys under the Cruelty to Animals Act, 1876, *as in the case of cats and dogs.—Mr. EDE replied:* I have no power to require such a certificate.

Births, Marriages, and Deaths

BIRTHS

ASTON.—On Dec. 3, the wife of Dr. J. N. Aston—a son.
BATES.—On Dec. 3, in London, the wife of Dr. D. V. Bates—a daughter.
CHILD.—On Nov. 28, at Newcastle-on-Tyne, the wife of Dr. J. P. Child—a son.
COLBECK.—On Nov. 27, at Auckland, N.Z., the wife of Dr. S. C. Colbeck—a daughter.
GILMORE.—On Nov. 29, the wife of Dr. H. C. Gilmore—a son.
HOEY.—On Nov. 28, at Oxford, the wife of Dr. Trevor Hoey—a son.
ILIFF.—On Nov. 29, at Leamington Spa, the wife of Dr. Arthur Iliff—a daughter.
MCCARTER.—On Nov. 26, at Guildford, the wife of Dr. G. R. B. McCarter—a daughter.
MACKELLAR.—On Nov. 25, at Dewsbury, the wife of Dr. John MacKellar—a son.
MURRAY.—On Nov. 27, at Aberdeen, the wife of Dr. F. Murray—a daughter.
SLATER.—On Dec. 3, at Bushey, the wife of Mr. N. S. Slater, F.R.C.S.—a son.
TRUELOVE.—On Nov. 30, at Oxford, the wife of Dr. Leslie Truelove—a son.

MARRIAGES

HILL—HAMILTON.—On Nov. 24, at Croydon, Alan George Seymour Hill, M.R.C.P.E., to Hilary Frances Hoyte Hamilton, M.R.C.P.E.
STEELE—TELFER.—On Dec. 4, in London, Ludovic MacWhinnie Steele to Florence Lindsay Telfer, M.D.
WATERSTON—TANNER.—On Dec. 1, at Perth, Scotland, David James Waterston, F.R.C.S.E., to Anne Tanner.

DEATHS

BRADLEY.—On Dec. 3, in London, James Edmund Campbell Bradley, B.A., M.B. Camb., aged 84.
CALLENDER.—On Dec. 2, Constance Muriel Callender, O.B.E., L.R.C.P.E.
DAVIS.—On Dec. 2, at Sonning-on-Thames, John James Davis, M.R.C.S., aged 43.
DREW.—On Nov. 27, at Fleet, Charles Milligan Drew, D.S.O., M.A., M.B. Glasg., colonel, A.M.S. retd, aged 68.
DURBRIDGE.—On Dec. 3, at Newport Pagnell, Henry Durbridge, M.R.C.S., aged 77.
GROVE.—On Nov. 28, William Reginald Grove, M.D. Camb., aged 79.
HORSLEY.—On Dec. 2, in London, Lancelot Horsley, M.R.C.S.
MONCRIEFF.—On Dec. 1, in London, Agnes Moncrieff, M.B. Glasg.
PARSONS.—On Dec. 4, in London, Frank Bett Parsons, M.A., M.D. Camb., F.R.C.P., aged 46.
ROBINSON.—On Dec. 3, at Eastbourne, Arthur Robinson, M.D., LL.D. Edin., F.R.C.S., F.R.C.S.E., aged 86.
STEWART.—On Dec. 4, in London, Edward Stewart, K.B.E., M.D. Brux., M.R.C.P., aged 91.

Notes and News

PAYMENTS FROM THE INDUCEMENT FUND

No final decisions on the disposal of the Special Inducements Fund will be possible until the full extent of the demands on it are known. However, after consultation with the Medical Practices Committee the Minister of Health has decided that in the meantime provisional payments should be allowed in cases of special hardship, with particular consideration for claims from sparsely populated areas. Before the final allocation is determined all applications will be reviewed to decide what further payments should be made and whether those already made should be increased. Information submitted in support of claims has hitherto often been incomplete; and executive councils have now received a standard form of application, on which the applicant is required to supply details about his full professional income and other data on his practice. The executive council then has to state, after consultation with the local medical committee, whether the practice concerned is necessary for the provision of general medical services in the area.

TYPHOID FEVER: TYPE J

IT is believed that 3 patients with typhoid fever—1 at Plaistow, 1 at Romford, and 1 at Lyme Regis—contracted the infection while en route from Australia to the United Kingdom, where they arrived in the first week of November. The organism responsible appears to belong to Vi-phage type J, which is not indigenous in England and Wales. It can be fairly assumed that type-J infections appearing here at the present time come from a common source, and it is suggested that practitioners caring for patients suffering from typhoid should make a special effort to see that strains of the infecting organism reach the National *Public* Health Laboratory Service. Medical officers of health hearing of other patients who may be associated with the incident are asked *to send details direct to* S.M.O., Med. 3, Ministry of Health, Whitehall, London, S.W.1.

A CHILD-HEALTH GROUP

IMPRESSED by the need for closer coördination, doctors and others engaged in the West of England in the various aspects *of health and disease in childhood last March formed* a group. This meets monthly; and at the first meeting members took part in a discussion, opened by Prof. A. V. Neale and Prof. R. H. Parry, on the Integration of the Preventive and Curative Aspects of Child Health. As a result of the group's activities, a breakdown of departmental barriers, an increasing integration *of divided functions, and a widening interest* in every facet of well-being in childhood are said already to be apparent. The secretary, Dr. R. C. Wofinden, may be addressed at Kenwith Lodge, Westbury Park, Bristol, 6.

FILM ON MILK PRODUCTION

The Milky Way (35 min.), produced by United Dairies Ltd., is a documentary film made primarily for student nurses; but it will be useful also to doctors, especially those concerned with public health, and to the general public. Each stage is shown from the cow on the farm to delivery at the front door. There is a clear diagram of H.T.S.T. (high-temperature short-time) pasteurisation; and scenes showing the testing of samples, without being too technical, illustrate the care taken to safeguard our milk-supplies.

University of Cambridge

On Nov. 27 the following degrees were *conferred*:

M.D.—T. St. M. Norris,* D. S. Short.

* By proxy.

University of Liverpool

Dr. R. A. Gregory has been appointed to the Holt chair of physiology in succession to Prof. W. H. Newton.

Dr. Gregory was awarded a Bayliss-Starling scholarship at University College in 1935, and in 1936 he took his M.SC. Lond. During the next three years, while holding a Sharpey physiology scholarship, he completed his clinical training at University College Hospital and in 1936 he obtained the Conjoint qualification. The same year he was awarded a Rockefeller travelling fellowship, and while in America he took his PH.D. at the North Western University, Chicago. After he returned to England he again held a Sharpey scholarship until, in 1942, he was appointed lecturer in physiology at University College. In 1944 he took up his present post of senior lecturer in experimental physiology at Liverpool.

University of Durham

On Thursday, Jan. 20, at 5 P.M., at the Royal Victoria Infirmary, Newcastle-on-Tyne, Sir Henry Dale, O.M., F.R.S., will deliver the fourth Rutherford Morison lecture. He is to speak on Physiology and Surgery.

University of Edinburgh

Mr. Walter Mercer has been appointed to the newly established chair of orthopædic surgery. He will also be director of orthopædics for the South-Eastern region of Scotland.

Mr. Mercer, who is 58 years of age, was educated at George Watson's College and the University of Edinburgh where he graduated in 1912. After holding resident appointments at the Cumberland Infirmary, Carlisle, and the Edinburgh Royal Infirmary, he served during the 1914–18 war in France, Italy, and the Mediterranean, later becoming specialist in operative surgery at the Edinburgh War Hospital in Bangour. After he was demobilised he settled in consulting practice in Edinburgh, and at present he is surgeon to the Royal Infirmary and lecturer in clinical surgery in the university. He is also surgeon in surgical tuberculosis to the S.E. Counties of Scotland Joint Sanatorium Board Hospital and to the City of Edinburgh, consulting surgeon to the Clinic for Limbless Pensioners, and surgeon to the the thoracic unit of Bangour Base Hospital. In 1938 he delivered the Lady Jones lecture, at Liverpool, on anomalies of the fifth lumbar vertebra, and his recent papers include an article on the surgical treatment of patent ductus arteriosus (1946). His textbook on *Orthopædic Surgery* reached its 3rd edition in 1945.

University of Hong-Kong

Colonel L. T. Ride has been appointed vice-chancellor of the university.

As an Australian Rhodes Scholar, Dr. Ride graduated in medicine at Oxford in 1927. Two years earlier he had been awarded a senior scholarship at Guy's Hospital, and after qualification he became demonstrator in physiology and pharmacology there. In 1928 he was appointed to the chair of physiology at Hong-Kong. During the late war Professor Ride had an active military career in China, and since then he has been in command of the Hong-Kong Volunteer Defence Force.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Dec. 2 Dr. W. D. D. Small was elected president, and Dr. W. A. Alexander, Dr. James Cameron, Dr. T. Douglas Inch, Dr. Ian Hill, Dr. James Hamilton, and Dr. A. P. C. Campbell were elected councillors for the ensuing year. Dr. Alexander was nominated vice-president.

Royal College of Surgeons in Ireland

The following have received the fellowship of the college:

D. V. Kneafsey, J. J. O'Shaughnessy, C. I. Wilkinson, W. H. W. De Wytt.

[illegible]al Air Force Appointment

Air Vice-Marshal F. J. Murphy has been appointed principal medical officer, R.A.F. Mediterranean and Middle East Command.

Air Vice-Marshal Murphy was until recently principal medical officer of R.A.F. Technical Training Command, to which he went in July, 1947, after having held a similar post at Bomber Command for nearly two years. He was formerly P.M.O., British Air Forces of Occupation, Germany, from July, 1945, and previously of the 2nd Tactical Air Force.

South-East Metropolitan Regional Tuberculosis Society

The inaugural meeting of this society was held on Nov. 13 with Dr. W. E. Roper-Saunders, assistant senior administrative medical officer to the regional hospital board, in the chair.

The following officers were elected: president, Brigadier H. L. Glyn-Hughes, S.A.M.O. to the board; vice-president, Dr. Roper-Saunders; chairman, Dr. F. Temple Clive; vice-chairman, Dr. R. Livingstone; treasurer, Dr. T. W. Lloyd; secretary, Dr. D. L. Pugh. Brigadier Glyn-Hughes said that the aims of the society were purely clinical; and he believed that the board would welcome the views of such a large body of informed opinion. The position of tuberculosis had deteriorated since the war, largely owing to shortage of staff. In the South-East Metropolitan region they were 3800 nurses short, and 8000 beds were unstaffed. With these shortages, he continued, careful assessment of cases for admission was needed. It was sometimes difficult for the tuberculosis officer to know for whom he was working, the board or the local health service, and the answer was to work as a team with the local health committees. The long and short term policy of the board was to give the chest physicians a number of beds under their own supervision.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Nov. 27, with Si William Gilliatt, the president, in the chair, the followin were admitted to the membership:

T. M. Abbas, Agnes U. Campbell, Margaret Fitzherbert, R. A Irani, Mary S. Jolly, Premavathi Maddimsetti Naidu, C. G. Nairn *Mohammad Siddique Qureshi, Helen M. Russell, Saran Abdulkadi* Siddiki, P. de S. Wijesekera.

The William Meredith Fletcher Shaw lectureship fo 1949 was awarded to Prof. R. W. Johnstone. Leverhulm scholarships, tenable for one year, were awarded to Dr. Fran Reid (for research into X-ray diagnosis of placenta prævia and to Dr. C. J. Mackinlay (for research into chronic infection of the vulva).

The following were granted the diploma in obstetrics of the college:

Tirath Ram Aggarwal, Patricia M. Aikman, Emma M. H. Albinson Nicholas Alders, Beryl G. Anscombe, D. J. Atherton, Renu Kan Banerjee, A. S. Barling, J. W. Bartum, K. S. P. Blatchley, V. Y Bockner, Mary M. M. Boyd, Mollie A. Brown, Joan M. Burrell Michael Byrne, G. S. Caithness, Elspeth S. K. Campbell, Harriett A Cawthorpe, Dorothy B. Charlton, G. R. Clare, M. H. Clark, Nancy G Clegg, Shirley Clifton-Smith, G. R. Connolly, Margaret M. Coughlan Vivienne A. Croxford, P. N. Cunliffe, R. G. Dewhurst, J. J. B Dias, Mary Douglas, Aileen P. M. Dring, E. W. Duncan, Violet M East, W. M. Edwards, Louise E. Elbert, Mary R. Ellis, W. I. Emslie O. J. *Farr*, T. R. *Farrimond*, *Mary E. G. Feetham*, G. S. *Foster*, Frances M. Fountain, Maud M. Frankland, T. P. S. Frew, Shanta Galande, H.-J. B. Galbraith, P. D. Gange, H. L. Gardner, Joy M. Gardner, W. F. T. George, Maurice Gold, D. S. M. Graham, Jean A Grant, F. G. Grant, Violet H. Gray, C. R. H. Green, A. G. Grossett, M. J. L. Hassall, J. K. Hawkey, Josephine M. R. Heber, F. W. Henderson, James Hendry, Mary M. Herley, J. T. Heron, S. R. Hewitt, Rachel M. Hickinbotham, H. F. Hills, J. D. Holdsworth, J. A. G. Holt, P. D. James, Robert Johnston, Daphne M. E. Kayton, R. G. M. Keeling, W. P. Kelly, R. F. S. Kirkham, Mary E. Larg, Helen M. J. Lawn, J. F. Leaver, Joyce R. Lewis, L. E. Lotimer, R. St. J. Lyburn, Ian Macdonald, A. M. Mackenzie, T. E. L. J. McNair, J. D. H. Mahony, Dorothy M. Marshall, Megat Khas bin Megat Omar, Rene M. Michelmore, J. L. Middlemiss, P. D. V. Moni, *Valerie N. Nairn, W. L. Needham, L. P. A. Newborne*, T. A. O'Donnell, Ann K. O'May, D. G. O'Sullivan, H. P. L. Ozorio, J. H. K. Parker, M. L. Paterson, L. J. Page, A. S. S. Playfair, P. K. Pybus, B. O. Reed, Dorothy M. Ridout, D. A. Road, Joan M. Robinson, Heather J. S. Ross, H. A. Rowley, J. L. D. Roy, A. O. Sankey, Eamon Sheehan, Pamela M. Smith, J. A. Sodipo, T. A. Solomon, F. V. Squires, P. J. Stack, Alexander Starritt, John. Stohlner, Doreen M. J. Stracey, A. S. Subramani, Elaine M. Sunderland, W. F. Sunderland, W. D. G. Tellam, Dorothy E. M. Thomas, S. W. Thomson, G. M. Turner, R. N. H. Vann, Lajjyavati Varma, A. S. Wallace, Alice M. Waters, Paul Watson, P. W. Wells, Philip, Wenchee Mao (Moore) D. B. B. Whitehouse, Edith J. Whitelaw, Alice R. E. Widdows, H. A. G. Winter, Ursula E. Zander, H. T. Zborowski.

Royal Society

The following have been elected officers and council for the ensuing year: president, Sir Robert Robinson; treasurer, Sir Thomas Merton; secretaries, Sir Edward Salisbury and Prof. David Brunt; foreign secretary, Prof. E. D. Adrian, O.M., M.D.; other members of council, Prof. J. D. Bernal, Prof. G. R. Cameron, F.R.C.P., Sir James Chadwick, Prof. S. Chapman, Prof. H. Davenport, Sir Frank Engledow, Prof. W. E. Garner, Prof. A. C. Hardy, Dr. C. H. Kellaway, F.R.C.P., Prof. G. F. Marrian, Sir William Stanier, Mr. H. G. Thornton, Prof. C. E. Tilley, Mr. A. E. Trueman, Prof. S. Zuckerman, M.D.

Oxford Graduates Medical Club

A dinner will be held at the Royal College of Surgeons. Lincoln's Inn Fields, London, W.C.2, on Friday, Feb. 18, at 7.30 P.M. All Oxford medical graduates who wish to attend should write to Mr. E. G. Tuckwell, the hon. secretary, 73, Harley Street, W.1.

Appeal Tribunals for Industrial Injuries

The Minister of National Insurance, under the National Insurance (Industrial Injuries) Act, 1946, has now set up medical appeal tribunals to deal with appeals from decisions of medical boards on the assessment of disablement resulting from industrial accidents and disease. A tribunal consists of a chairman, who is a lawyer, and two medical members drawn from a panel of consultants. The chairmen have been appointed by the Minister on the recommendation of the Lord Chancellor or the Lord Advocate, and the medical members on the recommendation of the heads of universities with medical faculties (in London, the presidents of the Royal Colleges of Physicians and Surgeons). These tribunals will meet as occasion demands in a number of towns throughout the country and notice of the meetings will be published locally. A tribunal sat in Birmingham on Dec. 7 and another will meet in Liverpool on Dec. 16. The proceedings will be in public, unless the tribunal directs otherwise.

A Welsh Society of Anæsthetists

A meeting will be held at Cardiff Royal Infirmary on Jan. 12, at 8 P.M., to discuss the formation of a society of anæsthetists in South Wales.

Medical Sickness Annuity & Life Assurance Society

From Nov. 17, 1948, no war-risk exclusion will be placed on new life-assurance policies made by this society. The war-risk clause on existing policies became inoperative from that date.

International Congress of Ophthalmology

The King and Queen have given their patronage to the 16th International Congress of Ophthalmology, which will be held in London, under the presidency of Sir Stewart Duke-Elder, from July 17 to 21, 1950. Those who wish to take part in the main discussions or to read papers should write to Mr. Keith Lyle, International Congress of Ophthalmology, 45, Lincoln's Inn Fields, London, W.C.2.

The New Social Legislation and the Family

A conference will be held at the Conway Hall, Red Lion Square, London, W.C.1, on Jan. 20 and 21, to discuss the working of the many new social measures now on the statute-book and to study their impact upon family life. There will be sessions on Children at School, the Children Act, the Family, and Old People. Speakers will include Dr. Margery Warren and Dr. A. Talbot Rogers. Further information may be had from the Town and Country Planning Association, The Planning Centre, 28, King Street, Covent Garden, W.C.2, or from the British Social Hygiene Council, Tavistock House North, Tavistock Square, W.C.1.

Care of Old People

At a conference held in London by the National Old People's Welfare Committee last month the 700 delegates from local authorities and voluntary organisations unanimously approved a resolution urging H.M. Government to grant priority for new building schemes to be started for the provision of accommodation and amenities for the old people under section 21 of the National Assistance Act. In the discussions Dr. T. Ruddock-West stressed the importance of coördination of statutory and voluntary services in the various fields of work which he described, and Dr. Trevor Howell explained the success of geriatric treatment of the aged sick and the dangers of an acceptance of the approach of senility.

Commonwealth and Empire Health and Tuberculosis Conference

The National Association for the Prevention of Tuberculosis will hold the second of these conferences at the Central Hall, Westminster, from July 5 to 8. The provisional programme includes discussions on Tuberculosis as a World Problem; Trends in Modern Treatment, including streptomycin and P.A.S.; Regional County Schemes; Comprehensive Schemes in a British Colony; Tuberculosis among Students and Nurses; Policy of B.C.G. Administration; Psychological and Social Readaptation in Industry; and Protection from Bovine Tuberculosis. Further particulars may be had from the secretary-general, N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1.

Royal Dental Hospital

The 32nd annual clinical At Home of the school was held on Nov. 27, when the hospital was open for inspection. Practical demonstrations and lectures on the operative, orthodontic, and other aspects of dental surgery were given in the morning, and in the afternoon clinical cases of interest were shown.

In the evening there was a large gathering of old and present students at the dinner at the Savoy Hotel. Mr. S. A. Riddett, who was in the chair, proposed the health of The Hospital and School. Mr. H. L. Hardwick, the new dean, in his reply, spoke of the loss that the hospital had sustained through the death of his predecessor, Mr. Harry Stobie. He went on to discuss the policy of the future, and the new association between the Royal Dental Hospital and St. George's. Lord Webb-Johnson, Dr. E. W. Fish, and Mr. P. G. Capon responded to the toast of The Guests proposed by Mr. B. W. Fickling. Though fog prevented some guests and old students from attending, weather conditions did not manage to damp the enjoyment of a pleasant evening.

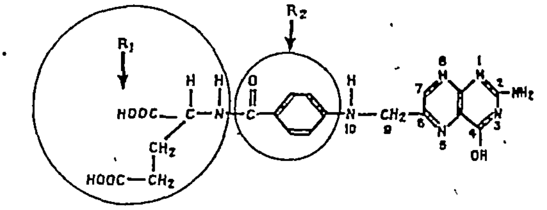
Florence Nightingale Hospital

This hospital for gentlewomen, which has now reopened, has occasional vacancies for acute cases. Fees are from 3 guineas for a cubicle and 6 to 8 guineas for a private room. The hospital has remained outside the National Health Service. Inquiries should be sent to the secretary at 19, Lisson Grove, London, N.W.1.

A memorial service for the late Dr. Louisa Hamilton will be held at St. Pancras Church this Saturday, at 11.30 A.M.

Mr. T. D. Haddow has been appointed an under-secretary in the Department of Health for Scotland. He was appointed to the department in 1935, and he was closely associated with the preparatory work for the National Health Service. He is at present visiting America under the auspices of the Commonwealth Fund, of New York, to study the administration of public health in that country.

CORRIGENDUM.—*Carcinogenic and Anticarcinogenic Substances:* In Professor Dodds's article of Nov. 27 the formula of folic acid (fig. 10) was given incorrectly. The formula is as follows:



Diary of the Week

DEC. 12 TO 18

Monday, 13th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. E. R. Boland: Silicosis.
ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. E. L. Patterson: Pelvic Floors and Walls.
5 P.M. Dr. J. Douglas Robertson: Disordered Metabolism in Thyrotoxicosis and Myxœdema.
MEDICAL SOCIETY OF LONDON, 11, Chandos Street, W.1
8.30 P.M. Dr. Paul Wood, Mr. A. Dickson Wright: Therapeutic Application of Anticoagulants.

Tuesday, 14th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Prof. D. M. Dunlop: Pharmacological Action of Anti-histamine Drugs.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Mr. S. Mottershead: Thoracic Operculum.
5 P.M. Dr. Robertson: Calcium Metabolism in Health and Disease.
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. I. Muende: Histopathology of the Skin.
CHELSEA CLINICAL SOCIETY
7.30 P.M. (South Kensington Hotel, 47, Queen's Gate Terrace, S.W.7.) Mr. Sidney Gilliat: Films and their Influence.

Wednesday, 15th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Dr. F. Avery Jones: Gastric and Duodenal Ulcer.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. C. McLaren West: Female Breast and its Development.
5 P.M. Dr. D. J. Bell: Carbohydrate Metabolism.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. C. W. McKenny: X-ray Technique.

Thursday, 16th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Professor Dunlop: Clinical Use of Anti-histamine Drugs.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. T. Nicol: Kidneys and Bladder.
5 P.M. Dr. Bell: *Carbohydrate Metabolism.*
INSTITUTE OF NEUROLOGY, Queen Square, W.C.1
5 P.M. Prof. M. Minkowski (Zürich): Cerebral Pathways of Vision.

Friday, 17th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Prof. L. J. Witts: Pathology of Pernicious Anæmia.
ROYAL COLLEGE OF SURGEONS
3.45 P.M. Mr. Clive Butler: Surgical Anatomy of the Rectum and Anal Canal.
5 P.M. Prof. A. C. Frazer: Fat Absorption and Metabolism.
MAIDA VALE HOSPITAL MEDICAL SCHOOL, W.9
5 P.M. Dr. E. A. Blake Pritchard: Case demonstration.
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. Shirley Smith: Clinical and Cardiographic Methods in the Diagnosis of Coronary Syndromes.

METABOLISM IN EXPERIMENTAL DIABETES MELLITUS *

F. G. YOUNG
D.Sc., Ph.D. Lond.
OFESSOR OF BIOCHEMISTRY IN THE UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE

UNDER the arresting title of Accident and Oppor- ism in Medical Research Sir Henry Dale delivered address to the recent annual meeting of the British dical Association in which he recalled, among other resting examples of the importance of good fortune research, the lucky accident which, in 1889, led Mering and Minkowski to observe the existence of condition resembling severe human diabetes mellitus a dog from which the pancreas had been surgically oved. It was the intention of these investigators examine the influence of pancreatectomy upon the orption of fat from the gut, and the pronounced yuria and glycosuria of the depancreatised animal wholly unexpected.

Despite the many attempts which were subsequently de, in Minkowski's laboratory and elsewhere, to pare from pancreatic tissue an extract whose adminis- on would alleviate pancreatic diabetes, more than ty years passed before the triumphant success of ting and Best made insulin available to the world.

he term "epoch-making" is used and abused with l facility these days; but never, in the whole ory of medical art and science, could it be more ropriately applied than to the discovery of insulin Banting and Best in 1921. There was nothing that 'd be described as accidental or opportunist in the thods by which was obtained the solution to a problem which many experienced investigators had repeatedly d. Even for those who did not know Banting elf it is not difficult to catch, from the published unts, something of the tense determination and vering optimism that was necessary to carry the hardy investigators through the many difficulties the hot Canadian summer of 1921. The experimental cation of the views which Banting had developed rely theoretical grounds provides the example *cellence* of the wisdom of never scorning a frontal on a problem of apparent immense complexity.

DIABETES AS AN ENTITY

Although his true memorial lies in the benefits which brought to his fellow men by his researches, it is not fitting that Sir Frederick Banting should also be called each year in a discussion of research work in ress upon the subject of diabetes, since all such earches may be described, in a sense, as descendants his own. The discovery of insulin provided a reasoned is for the simplest view of the ætiology of diabetes litus (and we should always adopt the simplest view the absence of concrete contrary evidence)—namely, t diabetes is caused by an absolute deficiency of lin production in the body. When it was later found, the result of the researches of Houssay and others, a diabetic condition could be produced experimen- y by means other than that of direct interference h the pancreas, and when, moreover, it was observed t experimental diabetes could be alleviated by ans other than the administration of insulin, the blem assumed a greater degree of complexity. The sibility had to be envisaged that such complications ht apply to clinical diabetes mellitus as well as to experimental condition.

In a recent leading article in a medical journal occurs the statement: "There is no laboratory method of inducing diabetes . . . which is *exactly* comparable to the clinical condition. At best we can get only crude approximations." The writer presumably intends to compare with the clinical condition not the "laboratory method of inducing diabetes" but the laboratory-induced condition. We may therefore paraphrase his statement as follows: "there is no experimentally induced diabetes which is exactly comparable with the clinical condition. We can get only crude approximations." Does there exist, in fact, a single clinical entity called diabetes mellitus? Or are there numerous clinical conditions characterised by hyperglycæmia, glycosuria, &c., which are lumped together under the term diabetes mellitus? I am not competent to answer these questions myself, but I find among my many clinical friends a strong inclination to the view that there is no single clinical entity. Likewise, although the experimental diabetic condition induced by surgical removal of the pancreas may be a reasonably constant entity among similar animals of comparable nutritional status from one species (although here the geneticists may have something to say), pancreatic diabetes varies greatly in intensity and symptoms from one species to another, and the substantial differences between, for example, depancreatised carnivores and herbivores were recognised by the earliest investigators in this field. We appear to be leaving further and further behind the world of forms inhabited by such ancient Greek philosophers as Plato and are approaching a nominalist attitude in which every patient and every experimental animal is regarded as a research problem to be studied *ab initio*. Although the increasing complexity of advancing knowledge makes the development of such an attitude inevitable we owe much to Banting and Best for being in no way deflected by such considerations; and we also should be grateful to the dog for exhibiting so constantly, after complete removal of the pancreas, a severe but not immediately fatal diabetic condition.

INDUCTION AND ALLEVIATION

Since the early days of insulin there have been developed important new methods both of inducing and of alleviating experimental diabetes. They include the following:

Experimental induction of diabetes	*Relevant experimental method of alleviation of an existing diabetes*
Complete pancreatectomy Partial pancreatectomy } (Minkowski)	Treatment with insulin (Banting and Best)
Administration of anterior pituitary extracts (H.M. Evans, Houssay, Young)	Hypophysectomy (Houssay)
Administration of certain adrenal cortical steroids (Long, Ingle)	Induction of adrenal insufficiency (Long)
Administration of alloxan (Shaw Dunn)	
Administration of glucose (Dohan and Lukens)	
Hypothalamic lesions (?) (Ranson)	

In addition it has been shown that hypophysectomy—and to a somewhat less extent adrenal insufficiency—greatly exaggerate the sensitivity of many animal species to the hypoglycæmic action of administered insulin, while conversely the administration of suitable anterior-pituitary extracts or of certain adrenal steroids can greatly diminish sensitivity to the hypoglycæmic action of insulin without necessarily raising the blood-sugar level of the insulin-insensitive animal.

It should be emphasised that the diabetogenic action of anterior-pituitary extracts has been observed in relatively few species of animal. The intact adult dog and cat (but not the puppy—Young 1941, 1944a—or the kitten—Young, unpublished) both respond well; the ferret and the rabbit do respond but less consistently;

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* second Banting memorial lecture of the Diabetic Association, delivered in the Clinical Research Laboratories, University of Edinburgh, on Sept. 24, 1948.

while most other species of animal which have been tested without preliminary surgical interference with the pancreas respond infrequently or not at all. The intact rat is almost completely refractory to the diabetogenic action of our anterior-pituitary extracts (which are highly effective in the adult dog or cat), and in our department Dr. Gwen Toby and Mr. E. Reid have found that in some instances the partially depancreatised rat and the alloxan-diabetic rat, which are already excreting sugar, fail to exhibit even an acerbation of the diabetic condition when given large doses of our diabetogenic anterior-pituitary extracts. In the few unpublished cases investigated, human diabetic patients have also failed to exhibit an obvious response to similar diabetogenic extracts. Such results differ from those with adrenocorticotropic pituitary extracts in other laboratories, and such a difference supports the view that the diabetogenic action of our pituitary extracts is not necessarily mediated by the adrenal glands. In any case the dangers of arguing from one species to another, or even from one strain to another of the same species, are certainly not to be neglected.

Even *within a given* species of animal substantial variations may be encountered which are hard to account for, and we have met such an instance recently, in the behaviour of certain cats with metahypophyseal diabetes, which puzzles us greatly.

METAHYPOPHYSEAL DIABETES IN THE INTACT CAT

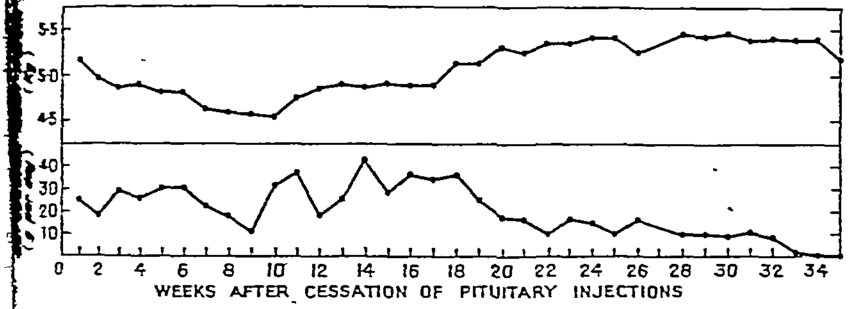
As was shown over ten years ago, a short period of the daily injection of a diabetogenic anterior-pituitary extract may induce the intact adult dog to become persistently diabetic (Young 1937), the islets of Langerhans exhibiting changes ranging from relatively mild degranulation to complete hyalinisation of the β cells (Richardson and Young 1938, Richardson 1940). Such a diabetic condition, persisting after the cessation of pituitary treatment (metahypophyseal diabetes), differs substantially from the condition found during the period of pituitary injections (which we may designate *idiohypophyseal* diabetes). For instance, substantial diminution in sensitivity to the hypoglycaemic action of insulin, a positive nitrogen balance, and an increase in body-weight may all be observed during the period of idiohypophyseal diabetes (Young 1945) but are not characteristic of the metahypophyseal condition (Marks and Young 1939, Young 1946). Indeed the simplest explanation of the existence of metahypophyseal diabetes is to attribute it to insulin deficiency resulting from the destruction of the insulin-secreting cells of the pancreatic islets: but, as I shall mention later, there are interesting differences between this condition and that resulting from pacreatectomy.

In the United States Dohan and Lukens (1939), having independently confirmed that metahypophyseal diabetes can be induced in the intact dog, extended their investigations to the partially depancreatised cat. Although these workers, unlike ourselves, were unable consistently to induce idiohypophyseal diabetes in the *intact* cat, they were successful with the cat from which had been surgically removed, at a preliminary operation, somewhat less pancreatic tissue than would have been required to induce glycosuria in the absence of further treatment. In such partially depancreatised cats it was relatively easy, by treatment with pituitary extract, to induce a diabetic condition which persisted after the treatment stopped. Such a persistently diabetic condition was associated with lesions of the pancreatic islets, which, however, differed from those observed in the dog with metahypophyseal diabetes in that the cat exhibited mainly hydropic vacuolation of the islet cells (cf. Lukens and Dohan 1942), in contrast to the total destruction often found in the dog. Working with partially depancreatised cats thus rendered persistently diabetic by pituitary treatme Dohan and Lukens found that often animals whic otherwise would have been expected to remain diabet indefinitely became apparently cured of the conditio if the blood-sugar was kept at a normal or subnorm level for more than a few days. Such diverse bloo sugar lowering procedures as reduction of the die treatment with insulin (Lukens and Dohan 1942), the administration of phlorrhizin (Lukens et al. 194 were all effective. In animals thus cured of otherwise persisting diabetes the islet lesions were al healed and a good correlation was established betwe the cure of the diabetic condition and the restoration the islet tissue (cf. Lukens and Dohan 1942).

Our diabetogenic anterior-pituitary extracts are effective in the normal unoperated cat as to make possible to employ the intact cat as a test animal f diabetogenic activity. In fact, before we were awa of the potency of our extracts in this respect, we kil a number of cats in diabetic coma by pituitary treatme For the purpose of testing, and roughly assaying, diabetogenic activity of our anterior-pituitary extra we naturally try to avoid excessive treatment and a to induce a condition which disappears within a f days of the cessation of pituitary injections; h over a period of some years, we have unintentiona produced a diabetic condition which has persisted af the cessation of pituitary treatment (metahypophys diabetes) in eight of our intact cats. We observed th cats after cessation of treatment for a period avera 12 weeks, during which they excreted, on an unlim diet of meat, 7–10 g. of glucose per day per kg. bo weight, the corrected D/N ration being of the orde 3/1—i.e., the animals were excreting over 80% of available carbohydrate. Some of these animals show intermittent ketonuria.

Two of these cats (nos. 83 and 95) were killed a time when the diabetic condition had persisted 14 weeks after the cessation of pituitary treatme *Histological examination of the endocrine tissues* these (and other) cats was undertaken by Mr. K. Richardson, of the department of anatomy, Univers College, London, and the detailed results of his inves gation will be published elsewhere (Richardson 19 Mr. Richardson reported that the β cells of the of Langerhans of the pancreas of cats 83 and 95 w uniformly hydropic throughout, although the α c appeared to be normal. Another cat (97) was trea with insulin after the metahypophyseal diabetes b persisted for 11 weeks, and was observed under insu for 4 weeks before it was killed. This animal prov to require rather more insulin than was expected fr day to day in order to control significantly the glycosu (8–10 units protamine zinc insulin per day = ab 3 units P.Z.I. per day per kg. body-weight). Richardson's report on the pancreas of this anim was that "nearly all the pancreatic islets had uniform hydropic β cells but a few islets near the main du had some intact β cells. Throughout this pancre there were at least 12 microscopic foci of proliferati of duct epithelium leading to the formation of (pr sumably) new acini and new islet tissue, the latter al showing hydropic degeneration."

After the metahypophyseal diabetes had lasted f 9 weeks from the last injection of pituitary extra cat 98 was also treated with insulin. The insul requirement was found to fall rapidly after 2 weeks therapy; it became sugar-free at the end of 3 wee and remained so despite the cessation of insulin admini tration. When it had been sugar-free for 9 days in th absence of insulin treatment it was killed, the termin blood-sugar level (fasting overnight) being 71 mg. pe 100 ml. According to Mr. Richardson, "the β cells all the pancreatic islets of cat 98 were uniformly hydrop



1—Glycosuria and body-weight in cat 106 after cessation of pituitary injections. Final blood-sugar was 96 mg. per 100 ml.

duct epithelium again showing foci of proliferative ge.”

view of these results it was decided to keep cat 106 out insulin treatment for as long as it would last. r about 17 weeks of persistent and substantial suria (circa 6–9 g. per day per kg.) subsequent to cessation of pituitary treatment, the sugar excretion an slowly to fall, while the body-weight, which had lly declined, began to rise again (fig. 1). After weeks of metahypophyseal diabetes the urine became r-free, and 11 days after the last appearance of r in the urine the animal was killed. Mr. Richardson ted that the islets exhibited uniform β cell hydropic eration, and after the most exhaustive study of pancreas he was unable to find evidence for the ence of any β cell which had not undergone extreme opic degeneration. *In these animals, therefore.* e the pituitary-treated partially depancreatised cats han and Lukens, there appeared to be no correlation een the disappearance of the diabetic condition the healing of the islet lesions.

ently Dohan and Lukens (1948) have published count of experiments in which a hyperglycæmia glycosuria persisted after the cessation of a period epeated intraperitoneal administration of glucose one normal cat and two cats from which half the as had been surgically removed at a preliminary tion. The glucose was given intraperitoneally in olution, usually thrice daily, and the total daily ried from 10 to 90 g. The normal cat was killed s after the cessation of glucose injections, by time it “was obviously weak and depressed and d clinical evidence of acidosis”: the islets of erhans showed severe hydropic degeneration. One the two cats from which half the pancreas had first removed died on the 9th day after the cessation cose treatment, and again hydropic lesions of the s of Langerhans were found. The other surgically ated cat (G43) exhibited severe glycosuria for weeks after the termination of glucose injections but the period 7–12 weeks the glycosuria diminished then disappeared. After 2 weeks’ freedom from suria the animal was killed and found to show ormalities in the pancreatic islets. “These were ished in number and the majority were very ll with only a few hydropic β cells remaining” an and Lukens 1948).

two of our cats with the pancreas intact, and in of those of Dohan and Lukens with half of its reas removed, an induced diabetic condition has ppeared, after persistence for many weeks, in the nce of gross abnormalities of the β cells of the reatic islets. Mr. Richardson fixed the whole reas of our cat 106 (fig. 1) in over fifty blocks and ined many sections from each block without finding ngle islet β cell that had failed to undergo gross dropic degeneration. It seems very unlikely indeed these grossly degenerate cells were capable of secreting much insulin. The disappearance of the diabetic condition is therefore hard to explain. Dohan and Lukens (1948) likewise comment that in their operated glucose-treated cat (G43) “the terminal disappearance of glycosuria is unexplained.”

POSSIBLE EXPLANATIONS

We may consider the possible explanations of our results that might reasonably be entertained:

1. The degenerate pancreatic islet β cells were indeed secreting sufficient insulin for the needs of the animal.

2. Cells other than those of the pancreatic islets were providing sufficient insulin.

3. Hypoactivity of the anterior lobe of the pituitary gland accounted for the condition.

4. *There had developed a depression in the rate of secretion* of those adrenal cortical steroids which influence carbohydrate metabolism.

5. The enzyme systems concerned in the metabolism of carbohydrate had become adapted to conditions in which little or no insulin was available and were functioning adequately despite this lack.

For the third and fourth possibilites Mr. Richardson has found no histological evidence in any of our animals. The first possibility is difficult to preclude, but on a histological basis is perhaps unlikely.

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What has already been suggested with respect to the thyroid hormone (Young 1944b) may well be true for other endocrine secretions—namely, that the elaboration of the hormone is not entirely confined to one gland or to one recognisable type of cell but may be a widespread property of the tissues of the body—a property which, however, has been highly developed in the cells of one particular organ. There is nothing so chemically peculiar about the insulin molecule as to preclude the possibility that it is a product, in small amounts, of many different types of cell.

With regard to the fifth possibility envisaged above, I myself consider that the enzyme system is so much more fundamental than the hormonal mechanism, despite the fact that in some instances the latter may control the degree of activity of the enzyme system, that to me sometimes too much attention appears to be paid to the hormonal mechanism, at the expense of the enzyme system. At present there is no evidence to support a supposition such as no. 5 above, but it should certainly not be neglected.

The cat provides puzzling exceptions to the general relationship, established in the dog, between the severity of the condition of metahypophyseal diabetes and the extent of the islet damage. Such experience is not yet paralleled by clinical observations, where it is more common to find little or no evidence of islet lesions in cases of frank diabetes. It will be of great interest to know whether the human being is more dog-like or cat-like in this respect.

Species variations in physiological effects of hormones, variations in responsiveness to hormones with age while most other species of animal which have been tested without preliminary surgical interference with the pancreas respond infrequently or not at all. The intact rat is almost completely refractory to the diabetogenic action of our anterior-pituitary extracts (which *are highly effective in the adult dog or cat*), and in our department Dr. Gwen Toby and Mr. E. Reid have found that in some instances the partially depancreatised *rat and the alloxan-diabetic rat, which are already* excreting sugar, fail to exhibit even an acerbation of the diabetic condition when given large doses of our diabetogenic anterior-pituitary extracts. In the few unpublished cases investigated, human diabetic patients have also failed to exhibit an obvious response to similar diabetogenic extracts. Such results differ from those with adrenocorticotropic pituitary extracts in other laboratories, and such a difference supports the view that the diabetogenic action of our pituitary extracts is not necessarily mediated by the adrenal glands. In any case the dangers of arguing from one species to another, or even from one strain to another of the same species, are certainly not to be neglected.

Even within a given species of animal substantial variations may be encountered which are hard to account for, and we have met such an instance recently, in the behaviour of certain cats with metahypophyseal diabetes, which puzzles us greatly.

METAHYPOPHYSEAL DIABETES IN THE INTACT CAT

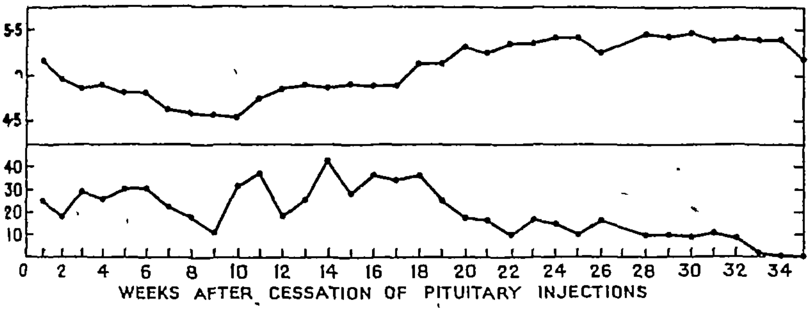
As was shown over ten years ago, a short period of the daily injection of a diabetogenic anterior-pituitary extract may induce the intact adult dog to become persistently diabetic (Young 1937), the islets of Langerhans exhibiting changes ranging from relatively mild *degranulation to complete hyalinisation of the β cells* (Richardson and Young, 1938, Richardson 1940). Such a diabetic condition, persisting after the cessation of pituitary treatment (metahypophyseal diabetes), differs substantially from the condition found during the period of pituitary injections (which we may designate *idiohypophyseal* diabetes). For instance, substantial diminution in sensitivity to the hypoglycæmic action of insulin, a positive nitrogen balance, and an increase in body-weight may all be observed during the period of idiohypophyseal diabetes (Young 1945) but are not characteristic of the metahypophyseal condition (Marks and Young 1939, Young 1946). Indeed the simplest explanation of the existence of metahypophyseal diabetes is to attribute it to insulin deficiency resulting from the destruction of the insulin-secreting cells of the pancreatic islets: but, as I shall mention later, there are interesting differences between this condition and that resulting from pacreatectomy.

In the United States Dohan and Lukens (1939), having independently confirmed that metahypophyseal diabetes can be induced in the intact dog, extended their investigations to the partially depancreatised cat. Although these workers, unlike ourselves, were unable consistently to induce idiohypophyseal diabetes in the *intact* cat, they were successful with the cat from which had been surgically removed, at a preliminary operation, somewhat less pancreatic tissue than would have been required to induce glycosuria in the absence of further treatment. In such partially depancreatised cats it was relatively easy, by treatment with pituitary extract, to induce a diabetic condition which persisted after the treatment stopped. Such a persistently diabetic condition was associated with lesions of the pancreatic islets, which, however, differed from those observed in the dog with metahypophyseal diabetes in that the cat exhibited mainly hydropic vacuolation of the islet cells (cf. Lukens and Dohan 1942), in contrast to the total destruction often found in the dog. Working with partially depancreatised cats thus rendered persistently diabetic by pituitary treatm Dohan and Lukens found that often animals wh otherwise would have been expected to remain diabet indefinitely became apparently cured of the conditi if the blood-sugar was kept at a normal or subnorm level for more than a few days. Such diverse bl sugar lowering procedures as reduction of the di treatment with insulin (Lukens and Dohan 1942), *the administration of phlorrhizin* (*Lukens et al.* 19 were all effective. In animals thus cured of otherwise persisting diabetes the islet lesions were healed and a good correlation was established betw the cure of the diabetic condition and the restoration the islet tissue (cf. Lukens and Dohan 1942).

Our diabetogenic anterior-pituitary extracts are effective in the normal unoperated cat as to make possible to employ the intact cat as a test animal diabetogenic activity. In fact, before we were aw of the potency of our extracts in this respect, we kil a number of cats in diabetic coma by pituitary treatme For the purpose of testing, and roughly assaying, diabetogenic activity of our anterior-pituitary extra we naturally try to avoid excessive treatment and to induce a condition which disappears within a days of the cessation of pituitary injections; over a period of some years, we have unintention produced a diabetic condition which has persisted a the cessation of pituitary treatment (metahypophy *diabetes) in eight of our intact cats.* We observed th cats after cessation of treatment for a period averag 12 weeks, during which they excreted, on an unlim diet of meat, 7–10 g. of glucose per day per kg. bo weight, the corrected D/N ration being of the order 3/1—i.e., the animals were excreting over 80% of *available carbohydrate. Some of these animals sho* intermittent ketonuria.

Two of these cats (nos. 83 and 95) were killed a time when the diabetic condition had persisted 14 weeks after the cessation of pituitary treatme Histological examination of the endocrine tissues these (and other) cats was undertaken by Mr. K. Richardson, of the department of anatomy, Univers College, London, and the detailed results of his inve gation will be published elsewhere (Richardson 19 Mr. Richardson reported that the β cells of the is of Langerhans of the pancreas of cats 83 and 95 w uniformly hydropic throughout, although the α c appeared to be normal. Another cat (97) was treat with insulin after the metahypophyseal diabetes h persisted for 11 weeks, and was observed under insu for 4 weeks before it was killed. This animal prov to require rather more insulin than was expected fr day to day in order to control significantly the glyco (8–10 units protamine zinc insulin per day = abo 3 units P.Z.I. per day per kg. body-weight). Richardson's report on the pancreas of this anim was that “ nearly all the pancreatic islets had uniform hydropic β cells but a few islets near the main du had some intact β cells. Throughout this pancre there were at least 12 microscopic foci of proliferati of duct epithelium leading to the formation of (pr sumably) new acini and new islet tissue, *the latter* al showing hydropic degeneration.”

After the metahypophyseal diabetes had lasted f 9 weeks from the last injection of pituitary extr cat 98 was also treated with insulin. The insul requirement was found to fall rapidly after 2 weeks therapy; it became sugar-free at the end of 3 wee and remained so despite the cessation of insulin admin tration. When it had been sugar-free for 9 days in th absence of insulin treatment it was killed, the termin blood-sugar level (fasting overnight) being 71 mg. pe 100 ml. According to Mr. Richardson, “ the β cells o all the pancreatic islets of cat 98 were uniformly hydropi



ycosuria and body-weight in cat 106 after cessation of pituitary injections. Final blood-sugar was 96 mg. per 100 ml.

duct epithelium again showing foci of proliferative ge.”

view of these results it was decided to keep cat 106 out insulin treatment for as long as it would last. r about 17 weeks of persistent and substantial osuria (circa 6–9 g. per day per kg.) subsequent to cessation of pituitary treatment, the sugar excretion n slowly to fall, while the body-weight, which had lly declined, began to rise again (fig. 1). After weeks of metahypophyseal diabetes the urine became r-free, and 11 days after the last appearance of r in the urine the animal was killed. Mr. Richardson rted that the islets exhibited uniform β cell hydropic eration, and after the most exhaustive study of pancreas he was unable to find evidence for the ence of any β cell which had not undergone extreme opic degeneration. In these animals, therefore, e the pituitary-treated partially depancreatised cats ohan and Lukens, there appeared to be no correlation ween the disappearance of the diabetic condition the healing of the islet lesions.

ecently Dohan and Lukens (1948) have published ccount of experiments in which a hyperglycæmia glycosuria persisted after the cessation of a period epeated intraperitoneal administration of glucose one normal cat and two cats from which half the eas had been surgically removed at a preliminary tion. The glucose was given intraperitoneally in olution, usually thrice daily, and the total daily ried from 10 to 90 g. The normal cat was killed ys after the cessation of glucose injections, by time it “ was obviously weak and depressed and d clinical evidence of acidosis ” ; the islets of erhans showed severe hydropic degeneration. One the two cats from which half the pancreas had first n removed died on the 9th day after the cessation glucose treatment, and again hydropic lesions of the ts of Langerhans were found. The other surgically rated cat (G43) exhibited severe glycosuria for weeks after the termination of glucose injections but ing the period 7–12 weeks the glycosuria diminished d then disappeared. After 2 weeks’ freedom from cosuria the animal was killed and found to show ormalities in the pancreatic islets. “ These were inished in number and the majority were very ll with only a few hydropic β cells remaining ” ohan and Lukens 1948).

In two of our cats with the pancreas intact, and in of those of Dohan and Lukens with half of its creas removed, an induced diabetic condition has ppeared, after persistence for many weeks, in the ence of gross abnormalities of the β cells of the creatic islets. Mr. Richardson fixed the whole ncreas of our cat 106 (fig. 1) in over fifty blocks and amined many sections from each block without finding single islet β cell that had failed to undergo gross ydropic degeneration. It seems very unlikely indeed at these grossly degenerate cells were capable of secreting much insulin. The disappearance of the diabetic condition is therefore hard to explain. Dohan and Lukens (1948) likewise comment that in their operated glucose-treated cat (G43) “ the terminal disappearance of glycosuria is unexplained.”

POSSIBLE EXPLANATIONS

We may consider the possible explanations of our results that might reasonably be entertained :

1. The degenerate pancreatic islet β cells were indeed secreting sufficient insulin for the needs of the animal.

2. Cells other than those of the pancreatic islets were providing sufficient insulin.

3. Hypoactivity of the anterior lobe of the pituitary gland accounted for the condition.

4. There had developed a depression in the rate of secretion of those adrenal cortical steroids which influence carbohydrate metabolism.

5. The enzyme systems concerned in the metabolism of carbohydrate had become adapted to conditions in which little or no insulin was available and were functioning adequately despite this lack.

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Species variations in physiological effects of hormones, variations in responsiveness to hormones with age

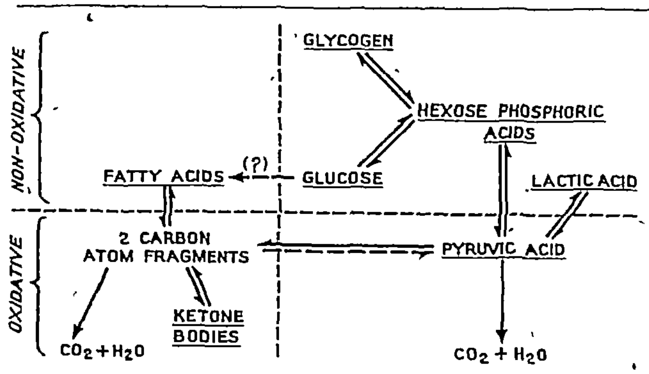

Fig. 2—Utilisation of glucose in the animal body.

within a given species (Young 1941, 1944a), and the important exceptions to the otherwise well-established correlationship between the persistence of diabetes and islet damage—all these phenomena lead the biochemist in particular to look for effects not on the animal as a whole (for these appear too often to be confusing), nor even on the organ as such (since here again species variations are sometimes met), but on the essential catalytic elements common to all living cells—the enzymes. Before, however, we consider the mechanism of action of insulin and of the pituitary diabetogenic factor in terms of their influence on enzyme systems I will say a few words about the state of our knowledge of the nature of these two substances, vast with respect to insulin, scanty with regard to the pituitary factor.

CHEMISTRY OF INSULIN

Probably more is known about the chemistry of insulin than about any other single protein, and the surprising fact has emerged that there is little very peculiar about it from the chemical point of view.

Evidence has accumulated during the past few years that many commercially available preparations of insulin contain a small proportion of an impurity which, in facilitating the conversion of glycogen to glucose in the liver may, in some degree, act antagonistically to insulin itself (cf. de Duve 1945, Sutherland and Cori 1947, Sutherland and de Duve 1948). Since, however, insulin is standardised on the rabbit or on the mouse with respect to its hypoglycæmic activity, the biological effectiveness of the different preparations should be constant, even though varying proportions of the impurity are present, unless the mouse and the rabbit differ substantially in the magnitude of their relative responses to insulin and to the glycogenolytic factor—a contingency which we may regard as unlikely in the absence of relevant evidence. The impurity has chemical properties very similar to those of insulin itself but is more chemically stable and so can survive treatments —e.g., with alkali—which destroy insulin.

At present it is not clear whether or not this substance is of physiological significance. If it is it may well be responsible for the significantly greater insulin requirement of the dog with metahypophyseal (Marks and Young 1939, Young 1946) or alloxan (Thorogood and Zimmerman 1945) diabetes as compared with the depancreatised dog. It might also account in some part for the other differences observed between depancreatised dogs and those exhibiting islet deficiency induced by treatment with pituitary extract or with alloxan. There is some evidence, which is not yet conclusive however, that the substance is produced by the α cells of the pancreatic islets; and if this is correct the chemical relations between insulin and its contaminant will be of interest to review in association with the morphological relation between the α and the β cells.

NATURE OF THE ANTERIOR-PITUITARY DIABETOGENIC SUBSTANCE

The fractionation of the anterior-pituitary diabetoge factor has been pursued in our laboratory for so time past (Young 1939, Reid and Young 1948, Co et al. 1948) and the fact that all such fractio combine growth-promoting activity with diabetoge activity emphasises once more the possible physiologi significance of the identity of these two factors.

MECHANISM OF ACTION OF INSULIN

As we have seen above, the species variations enco tered when the intact animal, or even the isolated org is examined leads one to look beyond the tissue to enzyme system responsible for its metabolic activi Fig. 2 outlines what we know about the metabolic f of glucose in the animal body. Evidence is accumulati that the storage of glucose in the form of fatty ac is much more quantitatively important than its stor as glycogen (cf. Stetten 1946), but unfortunately still know little about the mechanism of conversion glucose to fatty acids in the body. It is quite proba that this process takes place mainly, if not entir via hexose phosphoric acids and pyruvic acid,

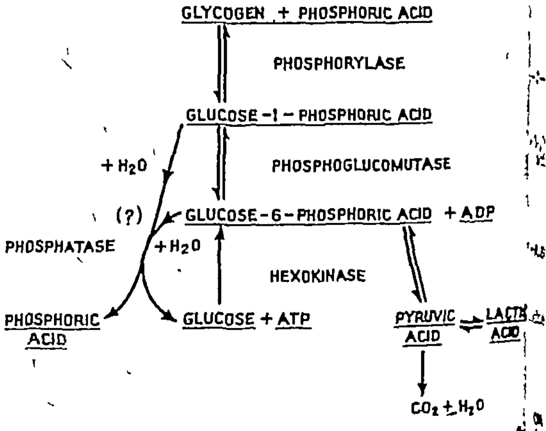

Fig. 3—Enzyme systems concerned in the formation of glycogen f glucose.

definite evidence on this point is lacking. Fig. 3 indica the enzyme systems involved in the direct equilibri between glucose and glycogen in the body. There also good evidence that the conversion of glucose glycogen also takes place by less direct pathwa involving fission of the glucose molecules into sma fragments, part of which are later incorporated in glycogen molecule.

When one considers that the structure of glycogen can built up, on paper at least, by removal of the elements water from suitable positions in a series of glucose molec (fig. 4, equation 1) one may wonder why the direct biologi conversion of glucose to glycogen appears to be a m more complicated process, and involves, as indicated in fig. the intermediate formation of phosphoric acid derivati of glucose. Although it is always unwise to attempt answer the question "why" in relation to happenings biology, it may be pointed out that any process in the bo which involves the elimination of the elements of water necessarily impeded by the fact that a cell is a dilute aqueo solution or suspension of the reactants; the high concent tion of water in the system naturally assists a contr reaction, that is, the addition of water to the products the reaction. On the other hand the synthesis of glycog from glucose-l-phosphoric acid, which involves the splitti out of the elements of phosphoric acid (equation 2), is subje to little impedance of this kind. Nevertheless, the dire synthesis of glucose-l-phosphoric acid from glucose a phosphoric acid does involve the elimination of a mo cule of water (equation 3), and, moreover, under t conditions likely to obtain in biological systems the equi brium position of this system (equation 3) involve

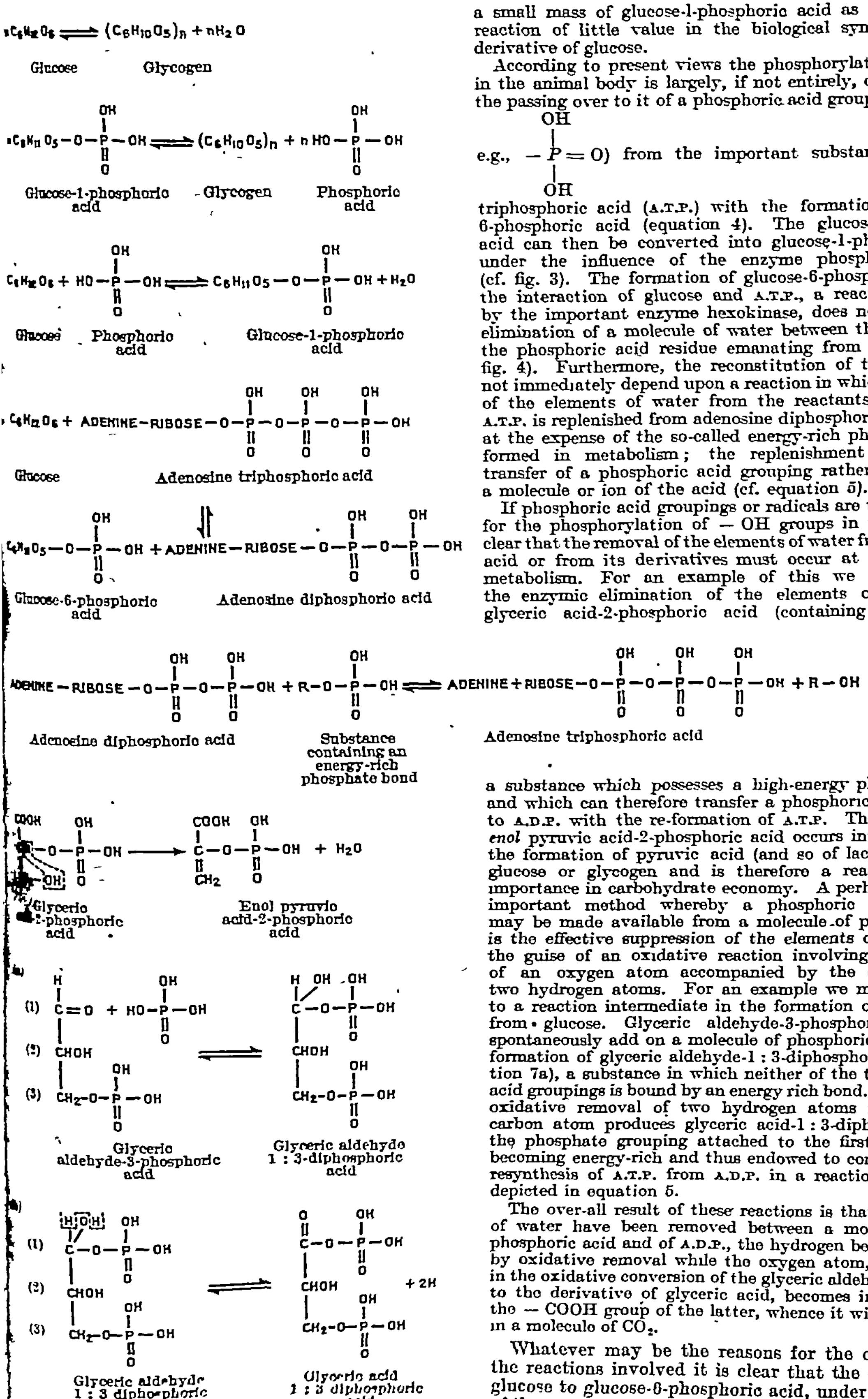
Glucose
Glycogen
Glucose-1-phosphoric acid
Glycogen
Phosphoric acid
Glucose
Phosphoric acid
Glucose-1-phosphoric acid
ADENINE—RIBOSE
Glucose
Adenosine triphosphoric acid
Glucose-6-phosphoric acid
Adenosine diphosphoric acid
Adenosine diphosphoric acid
Substance containing an energy-rich phosphate bond
Adenosine triphosphoric acid
Glyceric 2-phosphoric acid
Enol pyruvic acid-2-phosphoric acid
Glyceric aldehyde-3-phosphoric acid
Glyceric aldehyde 1 : 3-diphosphoric acid
Glyceric aldehyde 1 : 3 diphosphoric acid
Glyceric acid 1 : 3 diphosphoric acid

Fig. 4—Biological synthesis of glycogen.

a small mass of glucose-1-phosphoric acid as to render the reaction of little value in the biological synthesis of this derivative of glucose.

According to present views the phosphorylation of glucose in the animal body is largely, if not entirely, carried out by the passing over to it of a phosphoric acid grouping (radical: e.g., $-\overset{OH}{\underset{OH}{P}}=O$) from the important substance adenosine triphosphoric acid (A.T.P.) with the formation of glucose-6-phosphoric acid (equation 4). The glucose-6-phosphoric acid can then be converted into glucose-1-phosphoric acid under the influence of the enzyme phosphoglucomutase (cf. fig. 3). The formation of glucose-6-phosphoric acid by the interaction of glucose and A.T.P., a reaction catalysed by the important enzyme hexokinase, does not involve the elimination of a molecule of water between the glucose and the phosphoric acid residue emanating from the A.T.P. (cf. fig. 4). Furthermore, the reconstitution of the A.T.P. does not immediately depend upon a reaction in which the removal of the elements of water from the reactants occurs, since A.T.P. is replenished from adenosine diphosphoric acid (A.D.P.) at the expense of the so-called energy-rich phosphate bonds formed in metabolism; the replenishment involves the transfer of a phosphoric acid grouping rather than that of a molecule or ion of the acid (cf. equation 5).

If phosphoric acid groupings or radicals are to be available for the phosphorylation of — OH groups in the body it is clear that the removal of the elements of water from phosphoric acid or from its derivatives must occur at some stage of metabolism. For an example of this we may refer to the enzymic elimination of the elements of water from glyceric acid-2-phosphoric acid (containing a phosphoric acid grouping attached by a bond which is not energy-rich) to yield *enol* pyruvic acid-2-phosphoric acid (equation 6), a substance which possesses a high-energy phosphate bond and which can therefore transfer a phosphoric acid grouping to A.D.P. with the re-formation of A.T.P. The formation of *enol* pyruvic acid-2-phosphoric acid occurs intermediarily in the formation of pyruvic acid (and so of lactic acid) from glucose or glycogen and is therefore a reaction of some importance in carbohydrate economy. A perhaps even more important method whereby a phosphoric acid grouping may be made available from a molecule of phosphoric acid is the effective suppression of the elements of water under the guise of an oxidative reaction involving the retention of an oxygen atom accompanied by the elimination of two hydrogen atoms. For an example we may again turn to a reaction intermediate in the formation of pyruvic acid from glucose. Glyceric aldehyde-3-phosphoric acid may spontaneously add on a molecule of phosphoric acid with the formation of glyceric aldehyde-1 : 3-diphosphoric acid (equation 7a), a substance in which neither of the two phosphoric acid groupings is bound by an energy rich bond. Nevertheless, oxidative removal of two hydrogen atoms from the first carbon atom produces glyceric acid-1 : 3-diphosphoric acid, the phosphate grouping attached to the first carbon atom becoming energy-rich and thus endowed to contribute to the resynthesis of A.T.P. from A.D.P. in a reaction of the type depicted in equation 5.

The over-all result of these reactions is that the elements of water have been removed between a molecule each of phosphoric acid and of A.D.P., the hydrogen being eliminated by oxidative removal while the oxygen atom, also involved in the oxidative conversion of the glyceric aldehyde derivative to the derivative of glyceric acid, becomes incorporated in the — COOH group of the latter, whence it will later emerge in a molecule of CO_2.

Whatever may be the reasons for the complexity of the reactions involved it is clear that the conversion of glucose to glucose-6-phosphoric acid, under the influence of the enzyme hexokinase and at the expense of adenosine triphosphoric acid (A.T.P.), is an indispensable preliminary step in the utilisation of glucose for many metabolic purposes. Such a process of phosphorylation may be an essential step in the passage of glucose through many cell membranes, across which this sugar cannot freely diffuse in a physicochemical sense, and may thus mediate the utilisation of glucose within the cell for any metabolic purpose. Since the free energy available from glucose-6-phosphoric acid is much greater than that obtainable from glucose itself, it is clear that glucose will not be converted to glucose-6-phosphoric acid to any significant extent unless a suitable source of free energy is available. Such a source is provided by the fission of A.T.P. to yield A.D.P. plus a high-energy phosphate grouping (radical ?). The formation of glucose-6-phosphoric acid may therefore be regarded as an energy barrier which must be surmounted, at the expense of A.T.P., before glucose can begin to release the free energy locked in itself.

The possible importance of the enzyme hexokinase in carbohydrate metabolism is therefore clear and the significance of the observations of Dr. and Mrs. C. F. Cori and their collaborators on the in-vitro influence of hormones on this enzyme system becomes apparent (see Cori 1945, Colowick et al. 1947).

Cori et al. have shown that certain freshly prepared anterior-pituitary extracts can depress the activity of hexokinase in vitro, this depression being reinforced by the addition of certain extracts of the adrenal cortex to the system. This depressive action of anterior-pituitary extract on hexokinase activity can be prevented by the in-vitro addition of insulin to the system. Thus, for the first time, a direct antagonism has been demonstrated on an enzyme system in vitro between insulin and anterior-pituitary extract. At University College the essential observations of Cori et al. in this respect have been confirmed (Reid et al. 1948), but we have found that many pituitary extracts which are highly diabetogenic in the intact adult cat are without insulin-reversible hexokinase-inhibitory action in vitro. The pituitary hexokinase-inhibitor is extremely labile and disappears within a few hours of its preparation even if the extract is stored at low temperature, but the pituitary diabetogenic substance is much more robust. Hexokinase-inhibiting pituitary extracts are diabetogenic under the condition of our test (Reid and Young 1948), though the converse situation is not necessarily true. Reid et al. (1948) have put forward the view that the pituitary hexokinase-inhibitor and the diabetogenic substances are indeed substantially the same but that when pituitary extracts are stored for a few hours the responsible substance undergoes a change which deprives it of its hexokinase-inhibiting activity in vitro, such a change being reversible in vivo. Although it has not yet been possible in our laboratory to reverse, in vitro, the supposed change in stored diabetogenic pituitary extract and thus to restore the ability to inhibit reversibly hexokinase activity in vitro, nevertheless, Mr. J. H. Ottaway and Mr. R. H. Smith have recently made an interesting observation which may well be relevant to this problem. These investigators have used the isolated rat diaphragm, an isolated muscle preparation on which insulin acts in vitro to bring about an enhanced uptake of glucose from the suspending medium (Gemmill and Hamman 1941). Ottaway and Smith (1948) have found that preliminary in-vitro treatment of the isolated diaphragm with diabetogenic anterior-pituitary extract abolishes the expected rise in glucose uptake when the diaphragm is subsequently incubated with fresh medium containing insulin. Adequate control experiments demonstrate that the effect is not associated with non-specific proteins.

It is tempting to assume that in this isolated muscle preparation insulin and the pituitary extract are both influencing hexokinase activity, although there is no direct evidence for such an assumption. If, nevertheless, this view is correct it may well be that, since an inhibitory effect is exerted by stored diabetogenic pituitary extract which has no insulin-reversible inhibitory action on cell-free hexokinase preparations in vitro, the intact cells of the muscle tissue are bringing about a reversal of that supposed change in stored diabetogenic pituitary extract which was referred to above. Direct proof of this is lacking, however, at the present time.

With the kind coöperation of Prof. H. P. Himsworth and Dr. M. E. Morgans of the medical unit, University College Hospital medical school, Mr. Smith has been able to test, for insulin reversible [illegible] activity in vitro, samples of blood [illegible] types of clinical diabetes mellitus, but with completely negative results (Smith 1948).

If the pituitary diabetogenic factor inhibits hexokinase activity it inhibits a reaction which may be an obligatory step in the utilisation of glucose for many metabolic purposes. Such an activity could play an important part in the diabetogenic effect of our anterior-pituitary extract, although an alteration in the rate of insulin production in the pancreas may also be concerned. It is not so certain, however, that the main action of insulin in the body is the release of hexokinase from pituitary inhibition. Since the experiments of Houssay and Magenta (1924) it has been known that insulin exerts a greatly exaggerated hypoglycæmic action in hypophysectomised animals, and unless we assume that the hypophysectomised animal has some pituitary hexokinase-inhibitor available we must assume that insulin is here exerting some other action. Nevertheless, in view of the possibility discussed above that hormones are not necessarily and entirely specific for the endocrine glands that are their prime secretors, even in the hypophysectomised animal hexokinase activity may be under the antagonistic and balanced control of small amounts of (non-hypophyseal) pituitary factor and insulin. A small dose of exogenous insulin might then exert a greatly exaggerated effect. A similar argument could be applied to the metabolism of the hypophysectomised depancreatised animal.

Sutherland and Cori (1947) have recently stated in a short note that insulin promotes the formation of glycogen from glucose-1-phosphate in liver slices in vitro under certain conditions. This claim is as yet unconfirmed, but if it is correct it does not appear, a priori, that an effect of insulin on hexokinase is primarily concerned.

It is generally conceded that administration of insulin raises the rate of combustion of glucose provided that the blood-sugar of the treated animal does not fall to hypoglycæmic levels. Although insulin may play a direct part in accelerating the oxidation of glucose the influence of this hormone on the hexokinase system leading to an enhancement of the phosphorylation of glucose, might be expected secondarily to bring about a rise in the combustion of glucose, and indeed also to promote the conversion of glucose to fatty acids, &c.

FURTHER RESEARCH

We thus see that many of the protean activities of insulin may be brought under one roof by the study of the influence of hormones on enzyme systems in vitro. It is clear that much awaits to be learned from the further pursuit of such investigations but danger may lie in the over-emphasis of in-vitro reactions, since the importance of the economy of the animal body as a whole may be neglected. The biochemist is interested in taking a cell to pieces in order to examine its constitution, and particularly its enzyme constitution, but since it is the body as a whole in health and disease which is the ultimate object of his interests, it is important that the fitting of the pieces into the economy of the animal as a whole should not be neglected.

In paying tribute to the memory of Frederick Banting have a clear example before us of the paramount portance of courage in attempting the nearly impossible th the intact animal only as a guide. If we remember the significance of Banting's work has lost nothing its immensity with the passage of nearly thirty years, are less likely to neglect the sort of research he ried out, albeit we are so much less successful at it n he was.

SUMMARY

Earlier work on experimental diabetes is briefly viewed, and more recent observations on the influence the pituitary gland are discussed.

A distinction is drawn between idiohypophyseal betes (found experimentally during the period of itary injections) and metahypophyseal diabetes sisting after the injections cease). Unlike idiohypophyseal diabetes, metahypophyseal diabetes in the adult and cat is a condition not characterised by gross lin insensitivity.

In the dog metahypophyseal diabetes usually increases severity with the passage of time, but in two intact the condition, initially severe, disappeared after weeks. In these two animals the pancreatic ts showed extensive β cell hydropic degeneration the diabetes ceased.

The importance of phosphorylation in the utilisation glucose for metabolic purposes is discussed, particuly with regard to the formation of glycogen from ose-1-phosphoric acid by the elimination of the ents of phosphoric acid, as opposed to the direct ation from glucose involving the elimination of the ents of water.

e observations of Cori et al. on the inhibition by rior pituitary extract of hexokinase activity in vitro, reversal of this inhibition by the addition of insulin in vitro, have been confirmed. Though no simple ity can at present be established between the etogenic pituitary substance and the insulinssible hexokinase-inhibiting factor, the responsible stances appear to be closely related.

wish to express my gratitude to the Medical Research cil for their generous support of the researches on rimental diabetes carried out by myself and my colleagues a period of many years. I wish also to thank the tic Association not only for inviting me to give this but also for their assistance on many occasions dating the inception of the association. In this connexion ice and interest of Dr. R. D. Lawrence have been able.

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EARLY AMBULATION IN OBSTETRIC AND GYNÆCOLOGICAL CASES

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THERE is considerable variation in what is meant by early ambulation. In the United States it means getting out of bed in the first twenty-four hours after operation or delivery. In some parts of Europe the patient walks back from the theatre or delivery room. To me early ambulation means out of bed on the third postnatal or postoperative day, though occasionally I have followed Leithauser's (1946) technique of making the patient stand by the bedside and cough three or four times within eight hours of operation, particularly where pulmonary complications may be expected.

The results of a year's trial of such early ambulation is here compared with those of a previous year in a survey of 2735 admissions, with 1878 deliveries, including a large proportion of abnormal work, as follows:

OBSTETRICAL CASES

	1947	*1945*
No. of beds	80–103	70–80
No. of admissions	2735	1719
No. of deliveries	1878	966
No. of early risers	1611	Nil
Types of Case—	*1947*	*1945*
Spontaneous vertex delivery	1486	643
Forceps (all types)	204	201
Breech delivery	105	52
Cæsarean section (all types)	76	50
Episiotomy	293	178
Resutured	29	17
Second-degree tears	90	?
Resutured	2	—
Manual removal of placenta	82	8
Abortion	315	275
Thrombophlebitis (14 cases rose early)	24	10

Early Risers in 1947—	*No. of cases*
Spontaneous vertex deliveries	1308
Forceps (all types)	162
Breech deliveries	91
Cæsarean section (all types)	50

Average Days in Hospital after Delivery—	*1947*	*1945*
Spontaneous vertex deliveries	9·5	11·3
Forceps (all types)	11·2	16·8
Breech deliveries	11·8	13·2
Cæsarean sections	15·4	23·8
Thrombophlebitis (14 cases)	13·4	27·4

Obstetric patients normally lie in bed without putting a foot to the floor for 7 days at least in maternity hospitals and 10–12 days in nursing-homes. Owing to the shortage of hospital beds it has been impossible in maternity hospitals to keep patients for 12 days, and at times of stress they have had to be sent home on their fifth and sixth days. I felt it would be fairer to patients who had to go home at this early stage if they could at least go to the lavatory and perform simple duties for their babies on their arrival home. It is a serious hardship on a woman who has spent 7, 8, or 9 days in bed and lost a considerable amount of muscle tone to have to perform arduous household duties immediately on discharge from hospital.

RÉGIME FOR MATERNITY CASES

It is essential to have one's régime as simple as possible; nothing puts a patient off more than complicated exercises. This is particularly so with British women, with their self-consciousness and fear of seeming ridiculous. Fitzgibbon (1946), who has always been a keen protagonist of early activity, is very strong on this. My patients are allowed to lie or sit as they desire. If the baby is born in the morning, in the afternoon the mother sits on the edge of her bed and swings her legs; and if the baby arrives in the afternoon, the patient swings her legs next morning. The women are allowed to sit on the bedpan in bed or on a chair. A physiotherapist gives the patient simple abdominal breathing, foot circling, and knee exercises. All this takes place with the patient in bed. On the day after delivery, while dangling, they do more simple leg and foot exercises, and on the second day they are once more encouraged to sit in bed and swing their legs, and are given exercises for the contraction of the abdominal muscles; this never lasts for more than 10 min.

Either in the evening of the second or at the beginning of the third day after delivery they are encouraged to stand, walk round the foot of the bed, and sit in a chair; unless there is any contra-indication they are allowed to use the lavatory with the assistance of the nurses, who accompany them there and wait outside in case the patient may feel frightened or faint; so far this has not happened. After this the patients are allowed to move about at their own discretion in the wards and rooms, and go to the lavatory on their own. On the recommendation of a patient I had a simple broad platform with a railing and two steps made, so that patients could get accustomed to going up and down stairs, since many of them have to do so as soon as they get home.

This régime is applied to all normal vaginal deliveries with or without tears and episiotomies. In 1947 the proportion of episiotomies requiring resuture was 9·9%. In 1945, before early ambulation was introduced, the proportion was 9·6%, so early rising does not seem to have interfered with the rate of healing after episiotomy. Out of 90 second-degree tears in 1947 only 2 required resuture. Cæsarean sections and other abdominal operations are treated on the same régime. Baths are allowed after the fourth day.

Some patients are not permitted to rise early. These include cases of severe pre-eclamptic toxæmia where the blood-pressure has been over 160/100 mm. Hg; these patients are allowed to stay in bed until the blood-pressure shows signs of settling with their other symptoms. Simple cases of essential hypertension, however high the blood-pressure, will not benefit by 7 days in bed, so those are treated like normal deliveries. For example, a case of malignant hypertension with systolic blood-pressure of 280 mm. Hg had a hysterotomy done at the 26th week, her only therapeutic treatment being the extraction of a pint of blood, and she left the hospital after 12 days, on her feet and feeling very well. It is unlikely that anything will affect this woman's prognosis, and certainly not the lack of 10 days in bed. Eclamptic patients are treated with the usual amount of rest in bed whether they have had normal vaginal deliveries or not. If a patient's hæmoglobin is below 45%, she is not encouraged to walk until she has had a transfusion of packed cells and until her hæmoglobin has risen above 50%. Patients with heart trouble are kept at rest in bed as long as there are signs of decompensation.

RÉGIME FOR GYNÆCOLOGICAL CASES

The treatment of gynæcological cases by early postoperative rising has been popular in continental clinics for many years. In 1899 Ries cited a large series of surgical and gynæcological cases, and since then many doctors have used this method. Leithauser (1946) has summarised the procedure, but his cases were mainly general surgical ones.

My series is small; and, since this unit was only started in 1946, with 3–5 beds, comparison with the past is difficult.

GYNÆCOLOGICAL CASES

Beds available for first	3 months	..	3
,, ,, ,, second	3 ,,	..	9
,, ,, ,, last	6 ,,	..	14 (never completely filled)

Abdominal Operations—	
Total hysterectomy	27
Subtotal hysterectomy	7
Myomectomy	4
Gilliam suspension	7
Laparotomy	6
Oöphorectomy	10
Presacral neurectomy	4
Salpingectomy	2
Ectopic gestation	2
Total	69
Vaginal Operations—	
Vaginal hysterectomy	12
Fothergill-type repair	17
Aldridge sling	3
Other pelvic-floor and vaginal operations	28
Complete tears	3
Total	61
Miscellaneous non-operative	21
Dilatation and curettage	61
Total cases dealt with	212

Complications of Gynæcological Cases

Urinary

Two cases of cystitis: (1) after Fothergill-type repair (postoperative days 15); and (2) after vaginal hysterectomy (postoperative days 17). Both patients rose early.

Chest

Three cases: (1) bronchitis after repair of cystocele and pelvic floor (postoperative days 19); (2) small area of consolidation after repair of cystocele and pelvic floor (postoperative days 13); and (3) partial collapse of lung after abdominal operation (postoperative days 13). All these patients rose early.

Thrombophlebitis

Two cases: (1) after repair of cystocele and pelvic floor (postoperative days 12); and (2) after dilatation and curettage (postoperative days 11). Both patients were elderly women with varicose veins.

Wound Infection

Abdominal wound sepsis	7
Wound hæmatomata	2
Pelvic hæmatomata	3
Perineal wound sepsis	6
Total	18

Among early risers in this group were 5 women who had had abdominal operations (postoperative days 16, 14, 24, 18, 16) and 2 who had had vaginal operations (postoperative days 26, 18).

Average postoperative days in early rising cases of this group 18·8.

Among non-early risers there were 4 women who had had abdominal operations (postoperative days 24, 28, 19, 31) and 7 who had had vaginal operations (postoperative days 17, 27, 21, 12, 22, 33, 19).

Average postoperative days in non-early rising cases in this group 23·4.

Early ambulation was introduced because of lack of beds and nurses; but I would stress the point that it does not mean that the number of nursing staff in a ward is cut down. During the first three months of 1947 there were only 3 beds available. The number gradually grew until in the last six months of the year 14 beds were used. A long waiting-list made a quick turnover necessary. The procedure is almost the same as that followed in the maternity hospital for operation cases and need not be repeated here.

My operative technique is as simple as possible. Only double no. 0, double no. 1, and medium hard catgut is used with Mayo needles and a needle-holder, and for the skin continuous silk or clips. All suturing, whether in the abdomen or on the pelvic floor, is continuous. No interrupted sutures are used. Uterine pedicles &c. are ligated with double no. 1, and small skin vessels with no. 0. The patients are in hospital for two nights before operation, during which time they are examined and have simple preoperative treatment. They are all examined by the anæsthetist on the day before operation, and a general anæsthetic is always given. In the pelvic work no silkworm gut is used, the perineum being sutured with a continuous subcuticular catgut stitch.

Vaginal operations are followed by the same postoperative régime, the bowels being opened with mild purgatives and oil and soap-and-water enemas on the fourth day. The wounds are kept dry and are swabbed after the patient has used a bedpan. A male rubber catheter is put into the bladder and drained into a bottle for 3–5 days. If patients wish to sit up they are allowed

; otherwise they find the most comfortable position bed. When they get up, the catheter is clamped and d to the skin with sticking plaster. Sedatives are d as required, and most of these patients go home -12 days after operation.

If home conditions were satisfactory I have no doubt t these patients could go home within a week, but would not go so far as some and send them home hin 2–3 days of their operation. This would be a erdous saving in bed days and in money, both from e hospital's and the patients' points of view, but present housing conditions and servant problems t of the patients have insufficient help at home to rant their early return. In hospital, after the first k, the time is spent in progressing further in their ulation and becoming more able to look after selves.

RESULTS

It is in cases of cæsarean section, myomectomy, other operations that the psychological response rly rising is most pronounced, particularly in cases repeat cæsarean section in women who previously been 14 days in bed. The patients appear to be essed by their rapid return to normality, even allowance is made for the loyalty that patients for those that treat them (*Lancet*, 1947). I am vinced that they are better in every way than those in bed for a fortnight. Early rising is particularly ble after an abdominal operation because the of muscular tone is more rapid, and the interference respiration more complete, than in any other type ase, and recumbency reduces the vital capacity ichael and McGibbon 1939).

ny articles have been written to show that long mbency is especially dangerous in increasing the ity to pulmonary embolism, and Dock (1944) cited a series of middle-aged and elderly women in whom, days or weeks in bed, thrombosis in the dorsal t of the legs and feet was demonstrable in from a rter to a half of the cases. Another type of case re there is a threat of embolus is myomectomy, and y rising routine has been successfully adopted in an myomectomy, and in myomectomy where the has not yet been viable. There has been no death pulmonary embolism or respiratory complication r the obstetric or the gynæcological unit in 1947, e of the fact that there were 24 cases of thrombosis in the obstetric side and 2 in the gynæcological . In the obstetric unit most of these cases were en with old varicose veins in the legs; and, though ly ambulation does not prevent these patients getting mbophlebitis, they give the surgeon less anxiety, their convalescence is not delayed more than 3–4 s. When thrombophlebitis develops they are kept bed, but the leg is not immobilised, and the condition ckly settles down; during the last six months of 47 heparin was used in these cases.

Other concrete advantages of early rising are the uction in the incidence and duration of respiratory plications; the very minor amount of discomfort erienced in passing urine after total hysterectomy; , in operative obstetric deliveries, the reduced need catheterisation for residual urine.

A fact noted among the gynæcological cases is the high idence of wound infection. This has never been serious has lengthened the patient's stay in hospital. That incidence of these infections is not due to early rising own by the fact that of the 18 wound infections, 7 rose ly and 11 were kept non-ambulatory. The number of und infections in obstetric cases is not given, because ese have mainly occurred after lower-segment operations done in the presence of potentially infected wounds; number was very small, and all the patients recovered rapidly.

I suppose every surgeon embarking on early rising imagines the wound gaping open, the intestines falling out on the abdominal wall, or the viscera dropping through a gap in the perineum. So far the only case in which there has been a dehiscence of the abdominal wound was one of tuberculosis of the uterus, for which the patient had a total hysterectomy and stayed in bed for 3 weeks. After a secondary suture she made an excellent recovery. The causes of burst abdominal wounds are rapid autolysis of the catgut and distension. In 90% of cases of postoperative hernia in abdominal wound scars there is a history of peritonitis and tube drainage; in these cases in the past the patients have been confined to bed.

Newburger (1943) found in experiments on rats that the tensile strength of wound scars after the third day was the same in animals kept at rest as in those left free to move about. In surgery on animals there is no simple method for keeping them at rest, yet their wounds usually heal without trouble. Markowitz (1937), in animals, emphasises the importance of careful closure and uses a technique very similar to that which I have outlined.

VERDICTS OF OTHERS

A Patient's View.—Recently a girl was delivered here who had been trained as a nurse at St. Mary's and Queen Charlotte's Hospitals, London. Asked to describe her experiences with early rising, she said that at first there was a feeling of heaviness in the vulva, perineum, anal region, and the bottom of the back, and some stiffness of the thigh muscles. These feelings gradually wore off by the seventh day. She was most comfortable walking properly with a straight back, with abdomen and buttocks well in. Getting up helped her to forget the confinement and prevented her from brooding over whether she could bear to have another baby or not; it also made her feel that her figure was getting a chance of a speedier return to normal.

The Sister's View.—Sisters in charge of postnatal wards are enthusiastic about early ambulation. One of them says that early rising is appreciated by the patients; involution appears to be no different, though the lochia are more profuse perhaps on the eighth day. There is no appreciable difference in the amount of linen soiled or the amount of work for the nurses, but the ward is apt to be untidier because the patients move about.

General Practitioners' Opinion.—I sent a questionnaire to all general practitioners in Ayrshire, and of the 55% who answered, 69% were in favour of early ambulation, 11% had no opinion either way, and 20% were against it. In gynæcological cases most practitioners were wholeheartedly for early ambulation, emphasising its excellent emotional effect on the patients on their return home, and their more rapid return to normal. With regard to obstetric cases the practitioners were more cautious. In some districts the wise women condemn early ambulation out of hand, and they are still a power in the land. The idea that a woman who has a child is entitled to 14 days' prostration afterwards is still current from Victorian days, when the middle-class had servants and the working-class had a daughter who stayed at home. The woman who rises after 10–14 days in bed takes another 10 days to get on her feet. The object of early ambulation is to avoid this, and it does so. There is, however, one thing which has to be guarded against and is important from the practitioners' point of view. A woman who has risen early under hospital discipline cannot go straight home and carry out her full household and social duties as she did before she was pregnant. Some women do this and consequently get over-tired.

CONCLUSIONS

I am convinced that early ambulation does no immediate harm either to obstetric or to gynæcological mother sits on the edge of her bed and swings her legs; and if the baby arrives in the afternoon, the patient swings her legs next morning. The women are allowed to sit on the bedpan in bed or on a chair. A physiotherapist gives the patient simple abdominal breathing, foot circling, and knee exercises. All this takes place with the patient in bed. On the day after delivery, while dangling, they do more simple leg and foot exercises, and on the second day they are once more encouraged to sit in bed and swing their legs, and are given exercises for the contraction of the abdominal muscles; this never lasts for more than 10 min.

Either in the evening of the second or at the beginning of the third day after delivery they are encouraged to stand, walk round the foot of the bed, and sit in a chair; unless there is any contra-indication they are allowed to use the lavatory with the assistance of the nurses, who accompany them there and wait outside in case the patient may feel frightened or faint; so far this has not happened. After this the patients are allowed to move about at their own discretion in the wards and rooms, and go to the lavatory on their own. On the recommendation of a patient I had a simple broad platform with a railing and two steps made, so that patients could get accustomed to going up and down stairs, since many of them have to do so as soon as they get home.

This régime is applied to all normal vaginal deliveries with or without tears and episiotomies. In 1947 the proportion of episiotomies requiring resuture was 9·9%. In 1945, before early ambulation was introduced, the proportion was 9·6%, so early rising does not seem to have interfered with the rate of healing after episiotomy. Out of 90 second-degree tears in 1947 only 2 required resuture. Cæsarean sections and other abdominal operations are treated on the same régime. Baths are allowed after the fourth day.

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GYNÆCOLOGICAL CASES

Beds available for	first	3 months	3
" " "	second	3 "	9
" " "	last	6 "	14 (never completely filled)

Abdominal Operations—	
Total hysterectomy	27
Subtotal hysterectomy	7
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Perineal wound sepsis	6
Total	18

Among early risers in this group were 5 women who had 1 abdominal operations (postoperative days 10, 14, 24, 18, 16) 2 who had had vaginal operations (postoperative days 20, 18).

Average postoperative days in early rising cases of this group 1

Among non-early risers there were 4 women who had abdominal operations (postoperative days 24, 28, 19, 31) and 7 w had had vaginal operations (postoperative days 17, 27, 21, 13, 33, 19).

Average postoperative days in non-early rising cases in group 23·4.

Early ambulation was introduced because of lack beds and nurses; but I would stress the point that does not mean that the number of nursing staff in ward is cut down. During the first three months of 1 there were only 3 beds available. The number gradu grew until in the last six months of the year 14 be were used. A long waiting-list made a quick turno necessary. The procedure is almost the same as th followed in the maternity hospital for operation cases a need not be repeated here.

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TABLE II—EFFECTS OF SINGLE DOSES OF ANTHISAN 200 MG. BY MOUTH ON INTRADERMAL HISTAMINE REACTION

Subject	Average diameters before anthisan (cm.)		Average diameters after anthisan (cm.)							
			2 hours		4 hours		11 hours		27 hours	
	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals
A	3.5	1.3	3.5	1.3	1.0	0.5	2.0	0.6	2.0	1.0
B	3.0	1.3	2.5	1.3	1.0	0.6	1.5	0.6	1.5	0.9
C	3.0	1.3	2.5	1.0	1.0	0.5	1.4	0.6	1.5	1.0
D	3.6	1.3	2.5	0.75	2.4	0.7	3.5	0.6	3.5	1.0
E	3.5	1.0	1.5	0.55	1.0	0.5	1.8	0.6	3.0	0.9
F	3.5	1.6	3.0	0.8	2.5	0.7	2.5	0.8	3.5	1.05
G	4.0	1.3	2.5	1.0	1.0	0.5	2.0	0.55	3.0	1.05
H	4.5	1.2	3.5	1.2	1.5	0.6	2.9	1.0	4.0	1.2
I	4.5	1.2	3.5	1.1	2.7	1.1	2.5	0.8	3.5	1.0
J	3.8	1.2	3.5	1.0	2.0	0.55	2.8	0.8	4.0	1.0
K	3.1	1.0	2.0	0.8	2.0	0.6	2.1	0.8	3.0	0.8
Mean	3.63	1.25	2.77	0.98	1.63	0.62	2.27	0.70	2.91	0.99
m − m₁	..	..	−0.86	−0.27	−2.00	−0.63	−1.36	−0.55	−0.71	−0.26
Em	0.160	0.031	0.206	0.069	0.208	0.054	0.19	0.042	0.274	0.033
Ed	..	..	0.261	0.086	0.262	0.074	0.248	0.066	0.317	0.061
	.	..	2.66	2.38	3.01	3.02	2.94	3.28	2.47	2.33

ion in *Response to Histamine Antagonists*

The response of different people to the anti-histamine s varied in the degree of maximal reduction of the ythema and wealing. When the maximal response of a son was poor with one of the drugs it was usually r with the others also. Of the eleven persons studied, degree of response in five (A, B, C, E, and G) was d; in three (D, F, and I) poor; and in the remaining e (H, J, and K) intermediate. Examples of good and r responses taken from tables I–III are shown in fig. 2. This variation in response did not seem to depend on extent of the initial reaction to intradermal histamine: r was there any obvious correlation between the degree cific response to the drugs, the toxic side-effects, the weight or build of the person.

It would be expected, on general pharmacological nds, that people who responded poorly to an ordinary of an anti-histamine drug would respond well if se were raised sufficiently. This was found to be nd is demonstrated in fig. 3, where the effect of the dose in subjects D, I, and J is shown.

rt from the differences already noted respecting the duration of action of each of the different anti-mine drugs there is considerable variation from one to another in this respect. But, as with the maximal effects, a person who showed a long duration of action with one of the agents showed, in most instances, a long duration of action with the other two. This is illustrated in subjects A, B, C, E, and G, all of whom showed a good maximal response (tables I–III), and it suggests a close correlation between these two aspects of the action.

Side-effects of Histamine Antagonists

In comparing the clinical value of anti-histamine drugs an important consideration is the ratio between the therapeutically effective dose and that which gives rise to side-effects. The assessment of the incidence and importance of the various side-effects is, however, complicated. The commonest symptoms are drowsiness and lassitude, and the reaction to these depends considerably on the sensitivity and type of the patient. Again, toxic symptoms are more common in ambulant persons than in those resting in bed. Thus seven ambulant medical workers on a single dose of anthisan 200 mg. all experienced mild symptoms, whereas of eleven men resting in bed on the same dose only one complained of a little drowsiness. When large clinical doses of the drugs were given, nearly all patients complained of some unpleasant side-effects. Such effects have occurred

TABLE III—EFFECTS OF SINGLE DOSES OF 3277 R.P. 50 MG. BY MOUTH ON INTRADERMAL HISTAMINE REACTION

Subject	Average diameter before 3277 R.P. (cm.)		Average diameter after 3277 R.P. (cm.)									
			1 hour		3½ hours		7½ hours		24 hours		32 hours	
	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals
A	3.0	1.3	1.8	0.95	1.5	0.8	1.2	0.75	1.2	0.65	1.4	0.9
B	3.4	1.3	1.4	1.0	1.6	0.7	1.0	0.75	1.0	0.85	2.2	0.95
C	2.6	1.35	1.6	0.95	1.1	0.7	1.2	0.7	1.4	0.7	1.2	0.9
D	3.4	1.15	2.1	0.85	2.4	0.75	1.8	0.85	3.6	0.95	3.2	1.1
E	3.9	1.3	1.65	0.95	1.5	0.7	1.1	0.65	1.4	0.7	1.4	0.8
F	3.6	1.2	3.2	0.95	2.4	0.9	2.2	0.7	2.6	0.9	2.2	0.9
G	4.2	1.4	2.2	0.85	0.9	0.75	1.7	0.7	1.6	0.8	1.9	0.95
H	4.5	1.4	3.7	1.0	2.1	0.9	2.2	0.9	3.2	1.1	3.0	0.95
I	3.2	1.1	3.4	0.9	1.9	0.8	2.2	0.65	2.9	0.9	2.9	0.8
J	4.0	1.0	2.2	0.8	1.5	0.6	1.7	0.6	3.2	0.9	3.0	0.8
K	4.2	1.2	1.6	0.75	1.1	0.55	1.4	0.85	1.7	1.2	2.4	0.8
Mean	3.64	1.25	2.32	0.90	1.65	0.74	1.61	0.74	2.16	0.88	2.4	0.89
m − m₁	..	..	−1.32	−0.35	−2.01	−0.51	−2.03	−0.51	−1.48	−0.37	−1.24	−0.36
Em	0.175	0.042	0.247	0.024	0.154	0.036	0.138	0.135	0.283	0.048	0.259	0.030
Ed	..	..	0.303	0.087	0.233	0.055	0.223	0.055	0.333	0.064	0.312	0.051
	.	.	2.73	3.22	2.897	3.09	3.01	3.08	2.64	2.72	2.73	3.06

patients, and it certainly allows a much bigger turnover of patients in hospital. It is hard perhaps on the staff, and for really efficient working a full ward staff is necessary as well as a physiotherapist, who saves the nurses much work by encouraging patients in their exercises.

My thanks are due to the medical staffs of Ayrshire Central Hospital and Ballochmyle Hospital for their assistance in compiling the statistics.

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SOME ASPECTS OF THE
ACTION OF HISTAMINE ANTAGONISTS

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THE reaction to an intradermal injection of histamine is modified if the injection is repeated at an interval after the oral administration of an adequate dose of a histamine antagonist. (Warembourg et al. 1944, Friedlaender and Feinberg 1946, Halpern et al. 1946a and b, Leavitt and Code 1947.) We present here the results of some preliminary observations in which the modification of the intradermal histamine reaction has been used to study the variation in effective dosage, duration of action, and other properties of various anti-histamine agents: 2-dimethylaminoethyl benzhydryl ether hydrochloride, introduced by Loew et al. (1945) and marketed as 'Benadryl' (Parke Davis); N(2-dimethylaminoethyl) N(*p*-methoxybenzyl) 2-aminopyridine, introduced by Bovet and Walthert (1944) as '2786 R.P.,' known in France and the U.S.A. as 'Neoantergan,' and now obtainable in this country under the name of 'Anthisan' (May & Baker); and N(dimethylamino-2-propyl) phenothiazine, first described by Halpern et al (1946a and b) and known as '3277 R.P.' Administratio of equal quantities of the different drugs was preclude by the wide differences in the ratio between the therapeutic and the toxic doses; ordinary clinical dose were therefore used.

TABLE I—EFFECTS OF SINGLE DOSES OF BENADRYL 100 MG. BY MOUTH ON INTRADERMAL HISTAMINE REACTION

Subject	Average diameters before *benadryl* (cm.)		Average diameters after benadryl (cm.)					
			1 hour		3 hours		10 hours	
	Flares	Weals	Flares	Weals	Flares	Weals	Flares	Weals
A	3·1	1·25	2·1	1·1	2·4	1·05	2·7	1·15
B	2·6	1·15	2 4	1·2	2·1	1·1	2·4	1·15
C	3·4	1·3	2·0	1·2	2·1	1·1	2·4	1·15
D	3·7	1·3	3·9	1·25	4·3	1·3	4·6	1·3
E	3·6	1·2	3·6	1·25	3·1	1·2	3·6	1·2
F	3·6	1·4	3·6	1·25	4·1	1·25	4·6	1·25
G	4·1	1·3	3·1	1·1	3·6	1·2	4·6	1·25
H	3 6	1·2	3·8	1·25	4·0	1·25	4·7	1·25
I	4·3	1·25	4·6	1·3	4·1	1·2	3·9	1·3
J	4·0	1·2	4·1	1·1	3·8	1·1	4·1	1·1
K	3·6	1·2	3·8	1·15	3·4	1·2	3·8	1·25
Mean	3·57	1·25	3·36	1·19	3·36	1·18	3·76	1·21
m_1-m_2	..	..	−0·21	−0·06	−0·21	−0·07	+0·19	−0 03
Em	0·147	0·024	0·259	0·027	0·250	0·024	0·268	0·024
Ed	..	..	0·298	0·036	0·290	0·034	0·305	0·034
t	..	..	1·18	1·82	1·24	2·04	0·97	1·53

The histamine reactions were produced on the vola surface of the forearm by the intradermal injectio of 0·05 ml. of a solution of histamine acid phosphat 0·01% *w/v* in saline solution. Each injection thu contained 5·0 μg. of the acid phosphate, equivalent t 1·81 μg. of histamine base.

Whereas the flare component of the histamine response clearly an area, the weal is three-dimensional and wou be properly measured as a volume; but it was not foun feasible to do this, and so both flares and weals were treate as areas. These can be determined by inking the outlines the reactions on the skin, transcribing them to thin tracing paper, and computing directly. With the dose of histami used, however, the reactions were such that the areas directly determined were virtually identical with tho calculated from the mean radius of each reaction, as obtain from the average of two diameters, measured at right ang in each instance. The labour involved in measuring t diameters was much less than in computing areas directl so all the measurements on patients were made in this wa the average diameters of the weal and of the flare bei determined 5–10 min. after the injection of each dose histamine. It is these measurements which are given tables I–IV and figs. 4–9, but in figs. 1–3 the ar calculated from these diameters are used. All the injectio and measurements on patients were carried out by the sa observer (R. P. W.).

In eleven men intradermal histamine reactions we measured before, and at intervals after, a single dose benadryl 100 mg. by mouth. After a week's rest t observations were repeated with anthisan 200 m and, after a further week, with 3277 R.P. 50 mg. Ot observations were made on twenty patients with chron urticaria in whom the effect of anthisan on the modification of the intradermal histamine reaction and of t urticaria was compared.

RESULTS

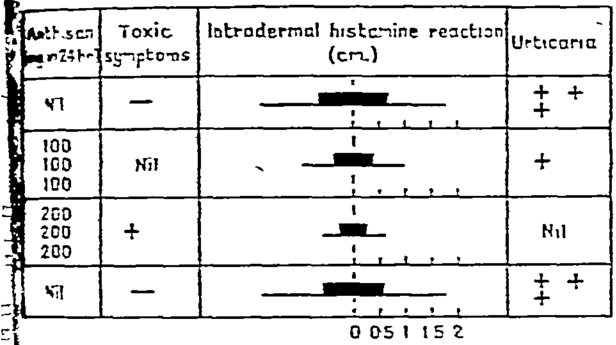
Modification of Normal Histamine Reaction by Sin Doses of Histamine Antagonists

Tables I–III give the results of these observatio together with their means, the differences in the mea (m_1-m_2), and the standard errors of the means (*E* and of their differences (*Ed*) calculated in the ordina way. The paired t-test (Fisher 1944) has been appli to the estimate of t given in the lowest row of the tabl A diagrammatic representation of the mean results given in fig. 1.

Judged from the mean maximal reduction of bo weals and flares, the effects of anthisan 200 mg. and 3277 R.P. 50 mg. were considerable and did not diff significantly, but the effects of benadryl 100 mg. we barely significant, and in the weal response alone, three hours.

The differences in duration of action of each of the thr drugs are also shown. Thus, though there was only questionably significant reduction of the weal respon 3 hours after administration of benadryl 100 mg., t effect of anthisan 200 mg. was still significant, both weal and flare responses, at 27 hours, and of 3277 R 50 mg. at 32 hours.

The frequency of our observations was not sufficie to enable us to get accurate information about a differences in the rate of establishment of the effe with each of the drugs, but it seems that anthisan an 3277 R.P. have some effect within an hour, and that t maximal effect is likely to be reached in 3–4 hours. T maximal effect persists longest with 3277 R.P.



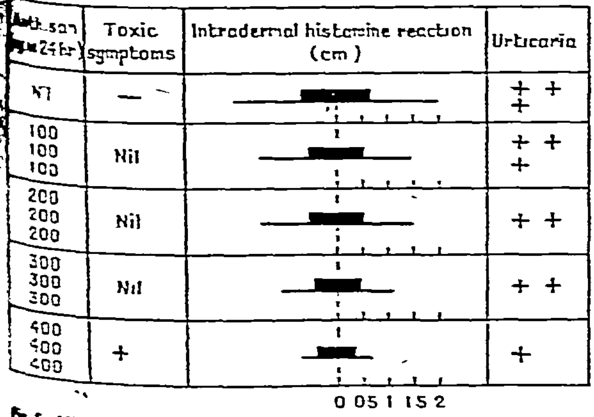
Anthisan mg. in 24 hr	Toxic symptoms	Intradermal histamine reaction (cm.)	Urticaria
Nil	—		+++
100 100 100	Nil		+
200 200 200	+		Nil
Nil	—		+++

Fig. 4—Average effective dose of anthisan in a man, aged 69, weight 78 kg., with urticaria present for 3 months.

Short Duration.—In a woman, aged 38, weight 50·5 kg., with urticaria present for 6 months, the intradermal histamine reaction was modified by anthisan 200 mg. t.d.s. Coincidentally the urticaria was suppressed during the day but reappeared about 2 A.M. (the doses of anthisan were given at 7 A.M., 1 P.M., and 6 P.M.). Thus, in this patient an effective level of anthisan was maintained for only 8 hours after ingestion. A further dose at 11 P.M. relieved this early morning urticaria.

Long Duration.—In a woman, aged 23, weight 63·5 kg., with urticaria present for 4 months, who provided an example of a low effective dose (fig. 7), anthisan 0 mg. modified the intradermal histamine reaction, and, given as a single dose at 8 A.M., suppressed the urticaria for 24 hours. If anthisan was discontinued, urticaria reappeared only 36 hours after the last dose. The intradermal histamine reaction remained modified 24 hours after the dose.

An example of side-effects associated with a low effective dose is given in fig. 9. Drowsiness and lassitude were severe for the patient to derive benefit from continued therapy. On the other hand, in a case cited as providing an example of a high effective dose of anthisan (fig. 5) the symptoms were not experienced until a dosage of mg. in 24 hours had been reached. Even then the symptoms were so mild that therapy was continued.



Anthisan mg. in 24 hr	Toxic symptoms	Intradermal histamine reaction (cm)	Urticaria
Nil	—		+++
100 100 100	Nil		+++
200 200 200	Nil		++
300 300 300	Nil		++
400 400 400	+		+

Fig. 5—High effective dose in a woman, aged 49, weight 55·5 kg., with urticaria present for 2½ years.

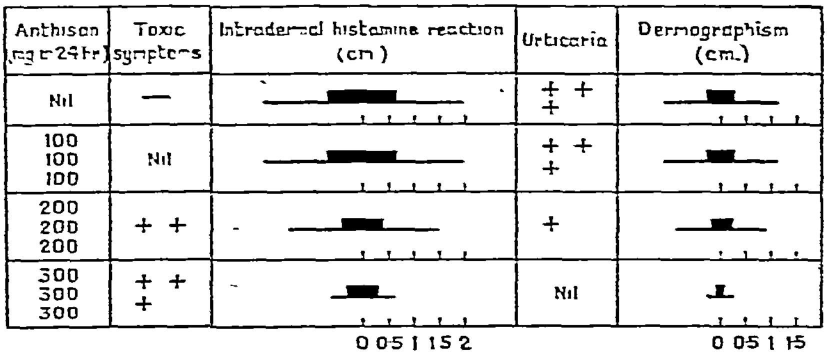
DISCUSSION

The intradermal histamine response shows clearly that there are well-marked differences not only in potency but also in the mean duration of action of the different anti-histamine drugs. Benadryl is short-acting, anthisan and 3277 R.P. are long-acting, and the action of 3277 R.P. lasts longer than that of anthisan.

This factor of duration of action for a single dose merits more attention than it has received in the clinical assessment of anti-histamine drugs. Indeed, next to the therapeutic ratio it may be the most important feature in any new drug of this class.

The question immediately arises: what mechanisms determine duration of action in the different drugs? Are the anti-histamine drugs, for example, analogous to the long-acting and the short-acting barbiturates, where duration of action depends simply on the rate of breakdown by the liver, or excretion by the kidneys, or both?

From preliminary experiments made by one of us (W. A. B.) in collaboration with P. B. Dews, it seems that the explanation is not so simple, and that one of the main factors may be variation in the degree and duration of fixation of the different drugs by the tissues on which they act. The subjects of these observations were medical students of either sex. In the first experiment it was intended to show the relative potencies of the three drugs by local administration to the skin. Each of thirty people had four intradermal injections, one of which contained 10 µg. of histamine base as control, and each of the others 10 µg. of histamine plus 100 µg. of the anti-histamine drug. The area of each weal was outlined in ink 5–10 min. after the injection, and the area determined from a tracing of the weal outline. Flares were disregarded because of the known local anæsthetic properties of the drugs. For convenience of presentation the results are expressed for each drug as the mean percentage reductions of the weal area below that of the control. The effects of simultaneous administration of histamine and the three anti-histamine drugs are shown in the first row of table IV. Benadryl and anthisan both gave significant reductions in the response, but, very surprisingly, 3277 R.P. did not.



Anthisan mg. in 24 hr	Toxic symptoms	Intradermal histamine reaction (cm)	Urticaria	Dermographism (cm.)
Nil	—		+++	
100 100 100	Nil		+++	
200 200 200	++		+	
300 300 300	+++		Nil	

Fig. 6—High effective dose in a man, aged 23, weight 65 kg., with urticaria present for 2 years associated with dermographism (mean of four measurements after use of different traumatising stimuli).

In view of these results we made further observations, in which areas of the skin were infiltrated with the anti-histamine drugs (0·2 ml. of 0·1% w/v) and the histamine was injected in different groups of people at different intervals thereafter. The control injection of histamine was made to an area of skin infiltrated with saline solution. The anti-histamine drugs in the concentration used caused a characteristic red reaction. The limits of the reaction were readily visible, and the subsequent histamine injection was given into this area. The results are given in the second and subsequent rows of table IV. The effect of benadryl was maximal at zero time (complete immediate fixation with maximal exclusion

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Key to figs. 4–9: (1) toxic symptoms: +, slight symptoms on questioning; ++, complaint of mild symptoms; +++, complaint of moderate symptoms; ++++, severe incapacitating symptoms; (2) urticaria: +, occasional weal; ++, a few weals; +++, moderate number of weals; ++++, profuse weals.

Intradermal histamine reaction from 0·05 ml. of 0·01% histamine acid phosphate. Mean diameters of flare (thin line) and weal (thick line) are recorded in cm.

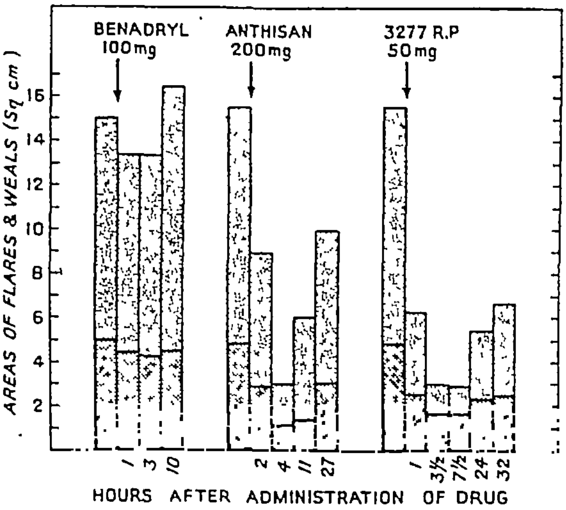

Fig. 1—Modification of intradermal histamine reaction by single doses of anti-histamine drugs (mean results from eleven people): stippled area 1½ times area of flares; hatched areas 4 times area of weals.

with low doses in a few people, and in some people have been pronounced before an effective anti-histamine dosage could be reached.

Of our eleven subjects benadryl 100 mg. caused drowsiness and lassitude in four, anthisan 200 mg. in one, and 3277 R.P. 50 mg. in five. The results in this small series are in accord with observations on other people, though experience with 3277 R.P. has been limited. Anthisan certainly has a considerably higher therapeutic ratio than has benadryl, but we have insufficient information to reach any definite conclusion about 3277 R.P. in this respect. Vallery-Radot et al. (1947), however, agree that side-effects are commonly experienced with 3277 R.P., but state that, when the therapy is continued for a few days, they tend to pass off.

Dryness of the mouth has been noted with benadryl and 3277 R.P. but was commoner with anthisan, developing in about 20% of patients on an average dose. It was noted about 2 hours after ingestion of the drug and lasted 1½–2 hours but did not cause serious discomfort or complaint. Average doses of anthisan in some patients caused mild colic, diarrhœa, nausea, and vomiting, which began about 1½ hours after ingestion and cleared after 1–1½ hours. Since the precautio of administering the drug in the middle of meals wa introduced we have had very little trouble from the effects.

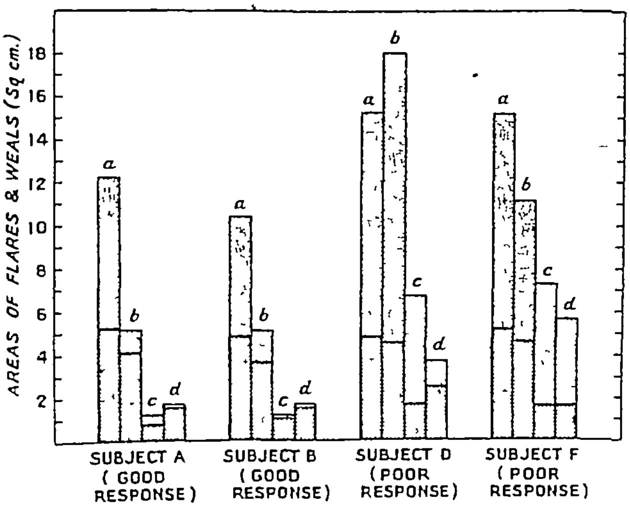

Fig. 2—Modification of intradermal histamine reaction by single doses of anti-histamine drugs in different people (A, B, D, and F): a, before administration of anti-histamine drug; b, after benadryl 100 mg.; c, after anthisan 200 mg.; d, after 3277 R.P. 50 mg.; stippled and hatched areas as in fig. 1.

Light-headedness, aching limbs, and ataxia have bee experienced with 3277 R.P.

Observations on Patients with Chronic Urticaria

Similar observations to the foregoing have bee carried out on twenty patients with chronic urticari the intradermal histamine reactions being noted a various times before, during, and after treatment wit anthisan.

The weals were suppressed or considerably modifie in all patients. Variation from one person to anothe in the response to the anti-histamine drug was show as in the foregoing observations, and in three patient who required large doses of anthisan the side-effect outweighed the value of continuing the suppressiv therapy.

In all cases the dosage necessary to reduce adequatel or to suppress, *the urticaria was that necessary to modif* appreciably the intradermal histamine reaction.

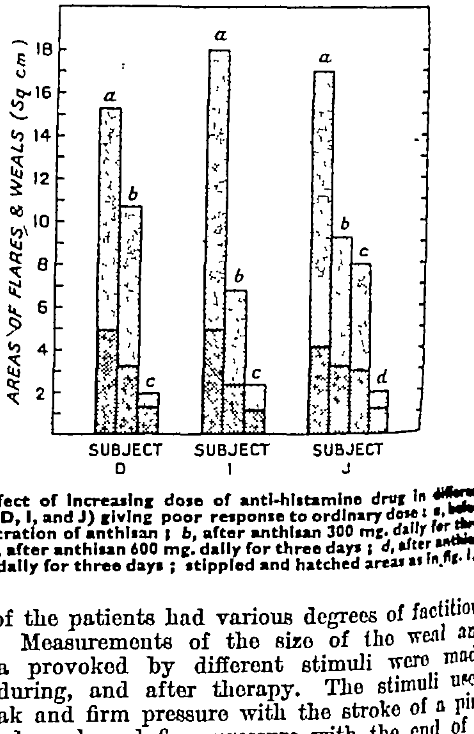

Fig. 3—Effect of increasing dose of anti-histamine drug in different people (D, I, and J) giving poor response to ordinary dose: a, before administration of anthisan; b, after anthisan 300 mg. daily for three days; c, after anthisan 600 mg. daily for three days; d, after anthisan 900 mg. daily for three days; stippled and hatched areas as in fig. 1.

Five of the patients had various degrees of factitiou wealing. Measurements of the size of the weal an erythema provoked by different stimuli were made before, during, and after therapy. The stimuli used were weak and firm pressure with the stroke of a pinpoint, and weak and firm pressure with the end of a cylindrical stick 2 mm. in diameter. The degree of reduction of weal and erythema by anthisan paralleled the reduction of the intradermal histamine reaction.

When the drug was stopped, urticaria recurred in most patients; two complained that it was more severe than before treatment, but in these, as in the others, the intradermal histamine reaction was *about* the same as before therapy. In the five patients who showed factitious wealing the *measurements* of the weal and erythema, when the drug was stopped, were about the same as they were before therapy.

The action of anthisan in these patients followed in all respects the course to be expected from the result of the observations recorded above. Various points are illustrated by examples from the case-records. Figs. 4–8 illustrate variation of the effective dose of anthisan from one person to another. The following are examples of variation of duration of action of anthisan from one person to another.

On the basis of our observations it is difficult to escape the conclusion that many of these failures were in people resistant to the drug, and that, if the dose had been suitably increased or a change made to a more powerful drug, the response in these people would have been satisfactory, as it was in our cases. In any event it is probable that, in previous work on anti-histamine drugs, even where attention was paid to differences in the potency and duration of action of the different drugs, there was little appreciation of the variation in response from one person to another to any one of them. It is clear, however, that this variation is important, and the methods described here are readily applicable to its assessment for clinical purposes.

SUMMARY

The quantitative modification of the intradermal histamine reaction by the oral administration of the anti-histamine drugs 'Benadryl,' 'Anthisan' ('Neoantergan'), and 3277 R.P. is described.

These drugs differ in their weight-for-weight effectiveness and in their duration of action, benadryl being classed as relatively weak and short-acting, and anthisan and 3277 R.P. as potent and long-acting.

There was considerable variation from one person to another in the degree and duration of the specific anti-histamine response to the drugs and in the incidence of side-effects. If the specific response to one drug was poor it was usually poor to the others also.

In people resistant to any of the anti-histamine drugs a "normal" response could be obtained by a suitable increase in the dose, the chief limiting factor being the incidence of unpleasant side-effects.

In 20 patients with chronic urticaria treated with anthisan, in all of whom the weals were suppressed or greatly modified, intradermal histamine reactions were recorded before and throughout treatment, and the modification of the reaction was found to parallel closely the response of the urticaria.

There was considerable variation from one person to another in the dose required to suppress the urticaria, and it is suggested that many of the reported failures in the treatment of urticaria with anti-histamine drugs were in patients resistant to the drugs, and that higher doses or more potent drugs might have produced satisfactory effects.

The results are discussed, with special reference to the importance of the differences in potency and duration of action of the different drugs and to the variation from one person to another in the response to any one. A possible factor in determining differences in duration of action is noted, and the significance of the variation in response from one person to another is emphasised.

Our thanks are due to Dr. J. T. Ingram for access to, and help with, the cases; Dr. B. N. Halpern for a supply of 3277 R.P.; Dr. W. R. Thrower for a supply of anthisan; and the Medical Research Council for an expenses grant to one of us (W. A. B.) to defray the cost of the work.

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DIMETHYLSULPHANILAMIDO-ISOXAZOLE (NU-445) IN URINARY INFECTIONS

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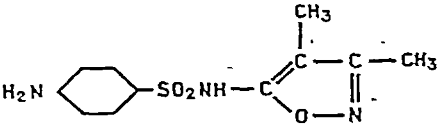
THE properties of a new sulphonamide, 'NU-445' (3-4 dimethyl-5-sulphanilamido-isoxazole),



make it suitable for the treatment of urinary infections, particularly those caused by gram-negative organisms. The drug is considerably more soluble than other sulphonamides (Gilligan and Plummer 1943), so that the risk of crystalluria is minimal, and high concentrations are easily obtainable in the urine, where it exhibits satisfactory antibacterial activity over a wide pH range (Schnitzer et al. 1946). The rate of absorption is high, and an adequate blood-level may be maintained with eight-hourly doses by mouth, while the incidence of toxic reactions is reported to be extremely low (Sarnoff 1948).

In the last eighteen months the drug has been submitted to clinical trial in urinary infection. It was thought that the value of the drug could be effectively assessed only by comparing the results with those in a control series treated with another optimally active sulphonamide ('Sulphamezathine'). Furthermore, it seemed desirable to avoid extraneous conditions which might influence the course of the infection in an irregular manner, such as operative procedures, continuous catheterisation, and suprapubic intubation, so that the trial should be restricted to well-defined cases apparently not needing auxiliary treatment. It was therefore decided to treat a consecutive series of female patients admitted to the Central Middlesex Hospital with a provisional diagnosis of pyelitis or cystopyelitis, alternate cases being treated with NU-445 and with sulphamezathine. In all, 60 cases were treated in this way.

METHOD OF TRIAL

All patients received uniform treatment except for the sulphonamide prescribed. NU-445 or sulphamezathine was administered in an initial dose of 3 g. followed by 2 g. at eight-hourly intervals until 31 g. had been given over five days. An adequate fluid intake was maintained, and small doses of alkali (potassium citrate gr. 60 daily) were given in all cases, though its omission in cases receiving NU-445 would have been warranted by the high solubility of this sulphonamide in acid urine.*

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* Some evidence has been adduced from a recent clinical trial that, despite its high solubility in acid urine, NU-445 may exert a greater bacteriostatic effect in slightly alkaline urine (Rodgers and Colby 1948).

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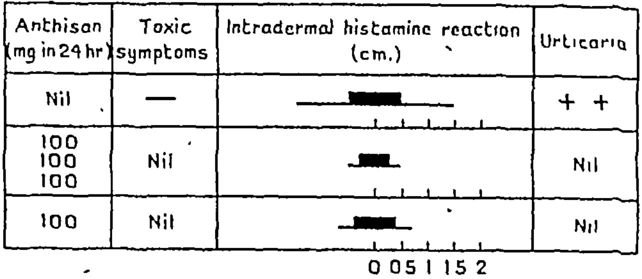
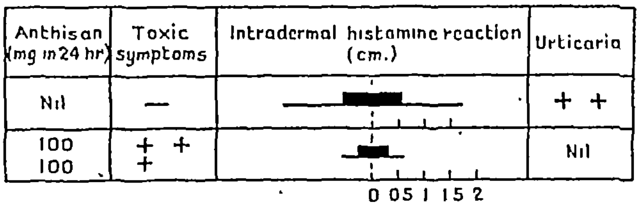


Anthisan (mg in 24 hr)	Toxic symptoms	Intradermal histamine reaction (cm.)	Urticaria
Nil	—		+ +
100 100 100	Nil		Nil
100	Nil		Nil

Fig. 7—Low effective dose in a woman, aged 23, weight 63·5 kg., with urticaria present for 4 months.

of histamine), began to pass off almost immediately, and was only questionably significant at 30 min. (light and short-lasting fixation). With anthisan the effect at zero time was not maximal (incomplete immediate fixation) but became so in a few minutes; there was still a significant effect at 100 min. (firm and lasting fixation). With 3277 R.P. there was no significant effect at zero time (slight immediate fixation), but the effect was maximal by 10–15 min. and was still at this level at 100 min. (firm and lasting fixation). In some subsequent observations on other subjects, but using a 1·5 µg. test dose of histamine, *significant effects have persisted* with anthisan to about 1000 min. and with 3277 R.P. to 3000 min. The standard errors of the observations in table IV give some idea of the variation from one person to another in both degree and duration of effect with the different anti-histamine drugs when administered locally to the skin.



Anthisan (mg in 24 hr)	Toxic symptoms	Intradermal histamine reaction (cm.)	Urticaria
Nil	—		+ +
100 100	+ + +		Nil

Fig. 9—Low effective dose associated with side-effects in a woman, aged 42, weight 58 kg., with urticaria present for 3 months.

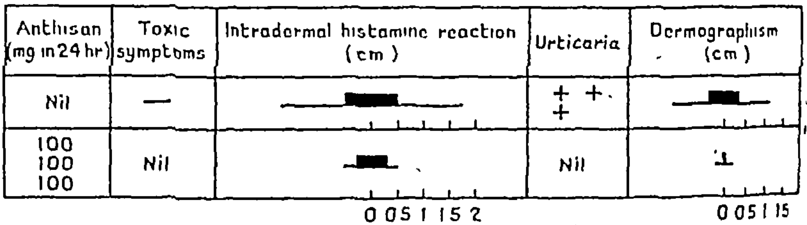
It is thus evident that the differences in duration of action of the three anti-histamine drugs given by mouth have features analogous to those shown after their local application to tissues. It cannot therefore be supposed that the different durations of action observed clinically are due simply to differences in the rate of excretion or detoxication of the drugs, but are probably due, in part at least, to differences in the "firmness of fixation" of each drug by the tissues.

Besides these differences in the duration of action characteristic of each of the anti-histamine drugs, it was to be expected that there would be considerable variation from one person to another in the response to the drugs as indicated by the intradermal histamine reaction or by the modification of an urticaria. This is amply shown by our results, as is the further point that the response in any person is comparable for all three drugs, with the result that a person who is, for example, resistant to anthisan is also resistant to 3277 R.P.

TABLE IV—ACTIONS OF ANTI-HISTAMINE DRUGS ADMINISTERED LOCALLY TO SKIN

Time between giving anti-histamine drug and histamine (min.)	No. of people	Mean % reduction in area of weal response, ± standard error of mean		
		Benadryl	Anthisan	3277 R.P.
0	30	25·5 ± 5·7	32·6 ± 5·8	9·9 ± 7·3
10	10	21·3 ± 8·0	46·6 ± 6·3	46·6 ± 9·1
30	10	16·8 ± 8·4	33·1 ± 6·0	41·1 ± 5·6
100	10	7·7 ± 12·2	26·8 ± 7·9	43·3 ± 5·2

It was to be expected, however, again on general grounds, that in people resistant to any anti-histamine drug (and in whom therefore the response to a given dose was less in degree and duration than the mean response), the degree and duration of the response could be made to approximate to the mean response for the particular drug by a suitable increase of the dose. This, in fact, is what happens. Thus, whereas the average daily dose of anthisan is 300 mg., people resistant to it and those who show a small and short response to such a dose, may give an adequate response after 600, 900, or even 1200 mg. in 24 hours. On the other hand, though in our 20 patients treatment with anthisan suppressed or considerably modified the urticaria in all, in three of these who were resistant to the drug, and to whom therefore large doses had to be administered, therapy was discontinued because toxic symptoms outweighed the value of suppressing the urticaria. Therefore, though adequate anti-histamine effects can be obtained with the present anti-histamine drugs in resistant people by a suitable increase of dose, the toxic effects which may derive from such a dosage are an important limiting factor in their usefulness.



Anthisan (mg in 24 hr)	Toxic symptoms	Intradermal histamine reaction (cm.)	Urticaria	Dermographism (cm.)
Nil	—		+ + +	
100 100 100	Nil		Nil	

Fig. 8—Low effective dose in a woman, aged 20, weight 64 kg., with urticaria present for 2 years associated with dermographism.

In some people who are only moderately resistant to these anti-histamine drugs adequate clinical effects may be obtained with normal dosage during the day; but, the duration of effective action being shorter than normal, a subeffective level is reached between the last dose on one day and the first on the next. Three of our patients on anthisan t.d.s. had recurrences of the urticaria in the early hours of the morning, some 8–12 hours after the last dose. This was completely controlled by giving an extra dose, with a little food, last thing at night.

Nearly all the reports published on the clinical use of anti-histamine drugs in chronic urticaria have shown *that some patients were not improved.* This number has varied from one worker to another as follows:

Reference	*Drug*	*No. of cases treated*	*No. not improved*
Friedlaender and Feinberg (1946)	Benadryl	11	4 2
[illegible] (1946)	Benadryl	11	3
[illegible]	Benadryl	15	1
[illegible]	Benadryl	8	10
[illegible] (47)	Benadryl	75	3
[illegible]	Benadryl	38	4
[illegible]	Benadryl	17	3
Levin (1946)	Benadryl	9	4
Waldbott (1946)	Benadryl	20	6
Osborne et al. (1947)	Pyribenzamine	15	93
Arbesman et al. (1946)	Pyribenzamine	107	
American Academy of Allergy (1946)	Pyribenzamine	97	21 6
Britton (1947)	Antistin	11	—
Hunter (1947)	Anthisan	8	1
Vallery-Radot et al. (1947)	3277 R.P.	47	—
Total		490	91

On the basis of our observations it is difficult to escape the conclusion that many of these failures were in people resistant to the drug, and that, if the dose had been suitably increased or a change made to a more powerful drug, the response in these people would have been satisfactory, as it was in our cases. In any event it is probable that, in previous work on anti-histamine drugs, even where attention was paid to differences in the potency and duration of action of the different drugs, there was little appreciation of the variation in response from one person to another to any one of them. It is clear, however, that this variation is important, and the methods described here are readily applicable to its assessment for clinical purposes.

SUMMARY

The quantitative modification of the intradermal histamine reaction by the oral administration of the anti-histamine drugs 'Benadryl,' 'Anthisan' ('Neoantergan'), and 3277 R.P. is described.

These drugs differ in their weight-for-weight effectiveness and in their duration of action, benadryl being classed as relatively weak and short-acting, and anthisan and 3277 R.P. as potent and long-acting.

There was considerable variation from one person to another in the degree and duration of the specific anti-histamine response to the drugs and in the incidence of side-effects. If the specific response to one drug was poor it was usually poor to the others also.

In people resistant to any of the anti-histamine drugs a "normal" response could be obtained by a suitable increase in the dose, the chief limiting factor being the incidence of unpleasant side-effects.

In 20 patients with chronic urticaria treated with anthisan, in all of whom the weals were suppressed or greatly modified, intradermal histamine reactions were recorded before and throughout treatment, and the modification of the reaction was found to parallel closely the response of the urticaria.

There was considerable variation from one person to another in the dose required to suppress the urticaria, and it is suggested that many of the reported failures in the treatment of urticaria with anti-histamine drugs were in patients resistant to the drugs, and that higher doses or more potent drugs might have produced satisfactory effects.

The results are discussed, with special reference to the importance of the differences in potency and duration of action of the different drugs and to the variation from one person to another in the response to any one. A possible factor in determining differences in duration of action is noted, and the significance of the variation in response from one person to another is emphasised.

Our thanks are due to Dr. J. T. Ingram for access to, and help with, the cases; Dr. B. N. Halpern for a supply of 3277 R.P.; Dr. W. R. Thrower for a supply of anthisan; and the Medical Research Council for an expenses grant to one of us (W. A. B.) to defray the cost of the work.

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DIMETHYLSULPHANILAMIDO-ISOXAZOLE (NU-445) IN URINARY INFECTIONS

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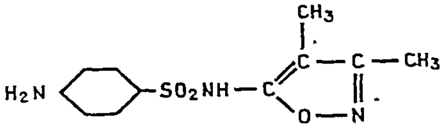
THE properties of a new sulphonamide, 'NU-445' (3-4 dimethyl-5-sulphanilamido-isoxazole),



make it suitable for the treatment of urinary infections, particularly those caused by gram-negative organisms. The drug is considerably more soluble than other sulphonamides (Gilligan and Plummer 1943), so that the risk of crystalluria is minimal, and high concentrations are easily obtainable in the urine, where it exhibits satisfactory antibacterial activity over a wide pH range (Schnitzer et al. 1946). The rate of absorption is high, and an adequate blood-level may be maintained with eight-hourly doses by mouth, while the incidence of toxic reactions is reported to be extremely low (Sarnoff, 1948).

In the last eighteen months the drug has been submitted to clinical trial in urinary infection. It was thought that the value of the drug could be effectively assessed only by comparing the results with those in a control series treated with another optimally active sulphonamide ('Sulphamezathine'). Furthermore, it seemed desirable to avoid extraneous conditions which might influence the course of the infection in an irregular manner, such as operative procedures, continuous catheterisation, and suprapubic intubation, so that the trial should be restricted to well-defined cases apparently not needing auxiliary treatment. It was therefore decided to treat a consecutive series of female patients admitted to the Central Middlesex Hospital with a provisional diagnosis of pyelitis or cystopyelitis, alternate cases being treated with NU-445 and with sulphamezathine. In all, 60 cases were treated in this way.

METHOD OF TRIAL

All patients received uniform treatment except for the sulphonamide prescribed. NU-445 or sulphamezathine was administered in an initial dose of 3 g. followed by 2 g. at eight-hourly intervals until 31 g. had been given over five days. An adequate fluid intake was maintained, and small doses of alkali (potassium citrate gr. 60 daily) were given in all cases, though its omission in cases receiving NU-445 would have been warranted by the high solubility of this sulphonamide in acid urine.*

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* Some evidence has been adduced from a recent clinical trial that, despite its high solubility in acid urine, NU-445 may exert a greater bacteriostatic effect in slightly alkaline urine (Rodgers and Colby 1948).

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Catheter specimens of urine were obtained immediately before treatment began and thereafter daily at 6 A.M. when the patient was awoken. Every precaution was taken to avoid contamination, and patients were urged not to micturate immediately before catheterisation, so that the samples of urine obtained might be as uniform as possible. All urines were examined for pus and organisms, and cultures were prepared from the early morning specimens to demonstrate the approximate number of bacterial colonies developing per ml. The urinary pH was also recorded.

Clearance of infection was assumed when there had been three successive negative cultures, cells had disappeared from the urine, and all symptoms had subsided. Subsequent follow-up examinations were conducted at intervals to assess the liability to recurrence.

Whenever infection persisted after the initial treatment, and in patients with recurrent infections, intravenous pyelography and a leucocyte-count were carried out before instituting a further course.

RESULTS

In 8 patients it was found that, owing to treatment before admission, the infection was already subsiding and urinary cultures were sterile. These 8 patients were therefore excluded from the study.

Of the remaining 52 patients, half of whom received NU-445 and half sulphamezathine, all showed unequivocal evidence of urinary-tract infection, with pus in the urine and positive bacterial cultures of coliform organisms (except in 1 instance, complicated by renal calculus, where staphylococci were isolated). As was to be expected, a small proportion of the cases (6) proved to be complicated by conditions necessitating surgical treatment. In addition, 4 patients were found to be diabetic, and 17 were pregnant.

TABLE I—RESPONSE TO SINGLE COURSE OF NU-445 OR SULPHAMEZATHINE

GROUP A: 26 CASES TREATED WITH NU-445

	No. of cases		
INFECTION CLEARED ..	19		
Uncomplicated cystopyelitis	12	Average period before urinary cultures sterile: 3 3 days.	Average period before pyuria disappeared: 5·4 days
Pyelitis of pregnancy	6		
Cystopyelitis and diabetes	1		
NO RESPONSE	7		
Pyelitis of pregnancy	5	Temporary remission followed by recurrences till term (3 cases). No further sulphonamide given. Temporary diminution of infection (2 cases). Subsequent courses of sulphamezathine ineffective.	
Congenital megalo-ureter	1	No response before surgical treatment.	
Calculous pyonephrosis	1		

GROUP B: 26 CASES TREATED WITH SULPHAMEZATHINE

	No. of cases		
INFECTION CLEARED ..	15		
Uncomplicated cystopyelitis	11	Average period before urinary cultures sterile: 4 days.	Average period before pyuria disappeared: 5 7 days.
Pyelitis of pregnancy	3		
Cystopyelitis and diabetes	1		
NO RESPONSE	11		
Uncomplicated cystopyelitis	4	No response. In all 4 cases infection subsequently cleared after course of NU-445.	
Pyelitis of pregnancy	1	Temporary remission followed by recurrences till term. Subsequent course of NU-445 ineffective.	
Cystopyelitis and diabetes	2	In 1 case infection subsequently cleared after course of NU-445. In 1 case infection persisted after course of NU-445.	
Pyelitis complicating:			
Renal calculus ..	2	No response before surgical treatment.	
Renal calculus and pregnancy ..	1		
Renal tuberculosis and pregnancy ..	1		

TABLE II—BACTERIOSTATIC EFFECT OF A SINGLE COURSE O NU-445 OR SULPHAMEZATHINE IN 23 UNCOMPLICATE *CASES OF CYSTOPYELITIS.*

GROUP A: 12 CASES TREATED WITH NU-445

Days for urine to become sterile	No. of cases	Colonies of *Bact. coli* per ml. urine (daily estimation)
2	6	>1,000,000 ; – ; –; – 10,000 ; – ; –, – >1,000,000 ; – ; – ; – 50,000 ; – ; – ; – >1,000,000 ; – ; – ; – >1,000,000 ; – ; – ; –
3	3	>1,000,000 ; 100,000 ; – ; – ; – >1,000,000 ; 300 ; – ; – ; – >1,000,000 ; 1,000,000 ; –, – ; –
4	1	100,000 ; 6000 ; 50,000 ; – ; – ; –
5	2	7,000,000 ; 1,000,000 ; – ; 50,000;–;–,– >1,000,000 ; >1,000,000 ; 1,000,000; 10,000 ; – ; – ; –

GROUP B: 11 CASES TREATED WITH SULPHAMEZATHINE

Days for urine to become sterile	No. of cases	Colonies of *Bact. coli* per ml. urine (daily estimation)
2	2	1,000,000 ; – ; – ; – 1,000,000 ; – ; – ; –
3	3	31,000 ; 1000 ; – ; – ; – >1,000,000 ; 6000 ; – ; – ; – >1,000,000 ; 1,000,000 ; – ; – ; –
4	5	500,000 ; 13,000 ; 5000 ; – ; – ; – >1,000,000 ; – ; 1,000,000 ; – ; – ; – 6000 ; 1000 ; 10,000 ; – ; – ; – >1,000,000 ; 1500 ; 2000 ; – ; – ; – >1,000,000 ; 25,000 ; 5000 ; – ; – ; –
7	1	>1,000,000 ; 10,000 ; 3000 ; 50,000 – ; 2000 ; – ; – ; –

– = Sterile culture. Three successive sterile cultures, with no pus in the urine and abatement of symptoms, were taken as indicating clearance of infection.

The results after a single course of treatment are summarised in table I.

Allowing for some variation in the acuteness of the infection and the stage at which treatment was begun, it appears from this table that the merits of the two sulphonamides are closely similar; but it is unfortunate, in such a small series, that the group receiving NU-445 was handicapped by an unduly high proportion of cases associated with pregnancy. Most cases started treatment within two or three days of the beginning of symptoms, and in all but 9 instances the initial urinary cultures yielded over a million colonies of coliform organisms per ml. (In the remaining 9, figures between 6000 and 100,000 were obtained.) Symptomatically the cases corresponded closely in type, being mainly women of child-bearing age with well-marked urinary frequency, dysuria, and moderate fever; only 2 patients had the classical form of acute pyelitis with severe loin pain and high pyrexia.

Progress during treatment in the cases which responded favourably to either sulphonamide was characterised by a remission of symptoms, diminution of the amount of pus in the urine, decline in the number of colonies of coliform organisms cultured per ml., and an increase in the urinary pH. Taking these points in order, it appeared clinically that the symptomatic response was slightly more rapid with NU-445. This impression was later substantiated by the subjective evidence of those patients who had not responded completely to a single course of one drug, and were subsequently treated with the other. There was no well-defined difference, however, in the over-all rate of disappearance of pus from the urine, nor in the diminution of bacterial colonies cultured; but on selective analysis of the 23 cases uncomplicated by pregnancy or diabetes, there was some indication that NU-445 exerted a more immediate bacteriostatic effect. Such an analysis may well be considered a more accurate indication of the value of NU-445, since it is well known that structural and functional changes in the urinary tract during pregnancy, and reduction of the general resistance in diabetes, may both affect the course of the infection in varying degree. The results obtained are listed in table II.

Despite the use of alkalis the urinary pH in most cases showed a decidedly acid reaction (average pH 5·6) during the first two or three days, rising thereafter to 6·5–7 in both groups uniformly as the infection subsided.

The 18 cases in which infection did not clear with a single course of sulphonamides (table I) may be grouped in two categories. 6 were found to be associated with a gross anatomical defect, tuberculous infection, or urinary calculus of sufficient significance to preclude any chance of the infection abating without operative measures. The other 12 cases were comparable in type with those which responded. It will be noted that 4 of these, though apparently uncomplicated, did not clear with a single course of sulphamezathine; symptoms and pyuria persisted, and cultures of urine on the fifth day of treatment still showed over a million colonies of coliform organisms per ml.; but a subsequent course of NU-445 ended the infection in an average of four days. Of the remaining 8 cases, all associated with either pregnancy (6) or diabetes (2), some abatement of infection took place during the initial course of sulphonamide in all except 1 diabetic.

In 3 of the pregnant patients treated with NU-445 temporary bacteriostasis and relief of symptoms were obtained, but recurrent infection was noted at the follow-up examination; no further sulphonamide was given. Of 3 other pregnant cases, 1 responded temporarily to sulphamezathine, but a subsequent recurrence of infection proved resistant to NU-445, and 2, though partially relieved, did not clear completely either with NU-445 or later with sulphamezathine. Of the 2 diabetic patients treated initially with sulphamezathine, 1 showed some reduction of the infection (as indicated by the bacterial-colony count) and finally cleared with a course of NU-445, whereas the other remained unchanged despite similar treatment.

In addition to the above series of cases, NU-445 has also been given to a small number of other patients, but without control. In cases of prostatic obstruction with infected urine the clinical results did not appear to differ from those obtained with other sulphonamides, and similar findings were obtained in the prophylaxis of urinary infection during indwelling catheter drainage for retention.

After suprapubic drainage of the bladder, instillation through the cystotomy tube of the lithium salt† in 10% solution, in place of the usual irrigating fluid, was not found to have any beneficial effect—in fact, in 1 case it seemed slightly irritating. The local growth of *Ps. pyocyanea* in 2 cases was not demonstrably inhibited by this method of application, and a single case of *Proteus* infection was not affected by a combination of local and oral therapy. In a recent report (Lazarus 1948), however, the instillation of a 20% solution of the lithium salt into the renal pelvis via a nephrostomy tube has proved successful in eliminating persistent infection, which suggests that there may be some scope for treatment by local application.

No toxic reactions, crystalluria, or other side-effects were observed in any of the controls or other patients to whom NU-445 was given.

SUMMARY

The new sulphonamide, NU-445, has been used to treat a controlled series of cases of coliform infection of the urinary tract. The advantages claimed for the preparation which led to the trial being undertaken were high solubility in urine (minimising the risk of crystalluria), effective antibacterial activity against gram-negative organisms, and extremely low toxicity.

Sixty cases of cystopyelitis in women were treated, alternate cases receiving NU-445 and sulphamezathine in similar dosage. The findings indicate that NU-445 falls into the class of optimally active sulphonamides, and that it compares favourably with sulphamezathine in its effect on gram-negative urinary infections. Although, for purposes of control, the dosage of NU-445 was lower than its solubility warranted, NU-445 achieved more rapid bacteriostasis than sulphamezathine in uncomplicated cases of cystopyelitis. In a small number of cases which proved resistant to sulphamezathine the infection cleared rapidly with NU-445. No toxic effects were observed in any case treated with NU-445, and it seems probable that the preparation may safely be given in much higher dosage to the more resistant cases of urinary-tract infection.

We wish to thank Dr. J. D. A. Gray for conducting the bacteriological investigations, Miss B. J. Smith for her painstaking work in organising the collection of specimens, and Roche Products Ltd. for supplies of NU-445.

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DETERMINATION OF HÆMOGLOBIN

VI. TEST OF THE M.R.C. GREY-WEDGE PHOTOMETER

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PREVIOUS papers in this series (Macfarlane et al. 1948, King et al. 1948a) have given the results obtained with a grey-wedge photometer described by King (1947). This is a modification and improvement of previous grey-wedge photometric instruments described by King et al. (1937) and King and Delory (1944). An instrument operating on a somewhat similar principle has been described by Duffie (1942, 1944, 1945). These results were so promising that the instrument is now being produced commercially as the "M.R.C. grey-wedge photometer." * In its manufactured form it has been subjected to test, the results of which are presented here.

PROCEDURES

A blood sample was taken from each of ten healthy adults. Alternate donors were male and female.

Base-line Methods.—Iron and gas analyses were done at the Postgraduate Medical School of London. Iron was determined by the titanous-chloride method of Wootton and King (1948), oxygen capacities by the Van Slyke manometric apparatus (Peters and Van Slyke 1930).

Preparation of Solutions.—Calibrated glass apparatus was used throughout. Oxyhæmoglobin solutions were prepared by diluting the blood samples 1 in 200 with $N/150$ NH_4OH. To prepare carboxyhæmoglobin solutions, the samples were diluted 1 in 200 with $N/15$ NH_4OH, shaken for several minutes in an atmosphere of coal gas, and allowed to stand for at least 30 min. to make sure of complete saturation.

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† This is the soluble form of the drug, prepared for intramuscular injection. It corresponds to the sodium salt of other sulphonamides.

* This instrument can now be obtained from Keeler Optical Products Ltd., 39, Wigmore Street, London, W.1.

Spectrophotometric measurements were made at the National Physical Laboratory as described by King et al. (1948a).

Colour Comparator.—The carboxyhæmoglobin solutions were compared in the National Physical Laboratory (N.P.L.) colour comparator with the B.S.S. Haldane standard.

M.R.C. Grey-wedge Photometer.—This is an instrument designed to measure the optical density of coloured liquids. It may be used in daylight by holding it squarely before an evenly illuminated window, or by artificial light, in which case a specially designed lamp-housing is attached to the front of the wedge-housing (fig. 1). The light falls on a diffusing screen and next passes through two apertures into the body of the photometer. In one light-path is placed a glass cell, 1 cm. deep, containing the coloured solution. The other light-path passes through a segment of an annular grey wedge and next through a compensating cell, filled with an appropriate solvent, to balance losses due to reflection and absorption. Light travelling along these symmetrical paths illuminates the two halves of an optical field viewed through the eyepiece of the instrument. In use, the light absorbed by the coloured liquid is balanced by rotating the annular grey wedge until equal brightness is obtained on both halves of the field. To make this match possible a monochromatic light filter is fitted over the eyepiece. The choice of filter is governed by three considerations: it must pass light of a colour strongly absorbed by the liquid; it must be of sufficiently high transmission to give a well-lit field; and, most important of all, the colour difference, if any, in the field, should be small enough not to disturb the accuracy of the matching. For solutions of oxyhæmoglobin the most suitable filter in the commercial range was found to be Ilford bright spectrum yellow-green no. 625.

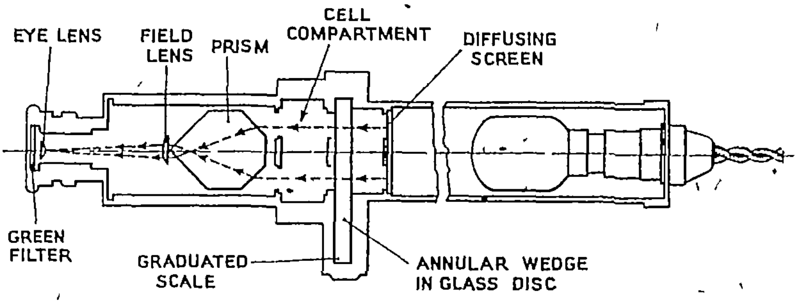

Fig. 1—Optical system of the M.R.C. photometer.

Calibration.—The experiment described here compares results on the calibrated M.R.C. photometer with results obtained by the standard base-line methods, measurement of iron and oxygen capacity. A brief outline of the calibration should suffice to show the principle that has been followed. First, the method of calibration is necessarily an easy practical one which can be used both by the manufacturer and by a standardising laboratory such as the N.P.L. It consists of preparing neutral glasses having absorptions corresponding to 50%, 100%, and 150% on the Haldane scale, and using these in the instrument to fix the 100% point and to indicate the spacing of the scale graduations. When this is done, the instrument reads directly in terms of percentage on B.S.S. Haldane scale, 100% ≡ 14·8 g. of Hb per 100 ml. (King et al. 1947). The preparation of the neutral standards is based on the absorption curve of oxyhæmoglobin in the visible spectrum. A mean curve for 21 bloods was obtained in a previous experiment (King et al. 1948a). If the photometer had been designed to use light that was strictly monochromatic, the absorption curve alone wou have given all the data required to make a neutral standard. The wave-length band transmitted by filter no. 625, however, is too broad for the filter to be assumed monochromatic. Fig. 2 shows the transmission curves of oxyhæmoglobin, the filter, and the combination of both. It can be seen that the distribution of the light transmitted by the filter is altered considerably by the oxyhæmoglobin. In using a broad-band filter it is still possible to calculate the *required optical density* of oxyhæmoglobin to the same accuracy as with monochromatic light, provided the transmission curve of the filter is known. This done for oxyhæmoglobin with filter no 625, and neutral standards were made in accordance. We hope to publish more about this type of calculation and its application to photo-electric hæmoglobinometers.

The calibration of the photometer is thus done in a roundabout way, starting from iron analysis and proceeding via *optical absorption, calculation, and neutral standards*. In this experiment results with the calibrated photometer are checked directly against determinations of iron and

Two instruments were used and twelve observers, six at the Postgraduate Medical School of London and six at the National Physical Laboratory. The instruments were loaded with the oxyhæmoglobin solutions mentioned above; on each solution each observer took *five readings in daylight and five in artificial light*.

RESULTS

All results are given in percentage of the B.S.S. Haldane scale. The following factors were used for interconversion:

(1) Hæmoglobin contains 0·334% Fe } (Hüfner 1894)
(2) 1 g. of hæmoglobin ≡ 1·34 ml. of O_2 } (Hüfner 1894)
(3) 100% Haldane ≡ 14·8 g. of Hb per 100 ml. (King et al 1947).

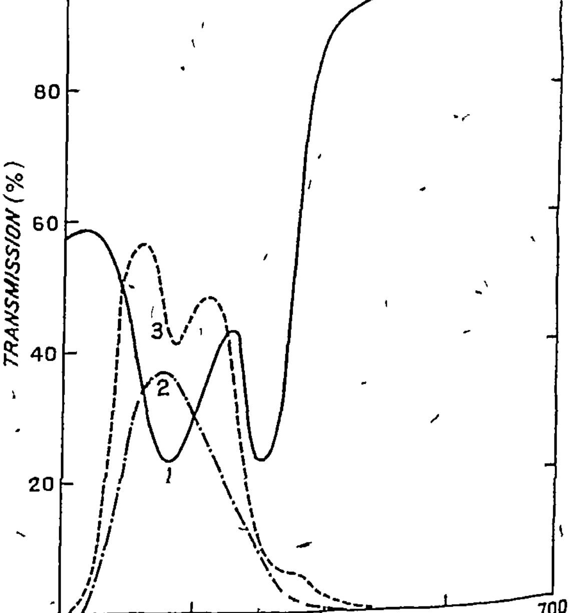

Fig. 2—Spectral transmission curves of oxyhæmoglobin solution (1), Ilford bright spectrum yellow-green filter no. 625 (2), and combination of oxyhæmoglobin and filter (3). Curve 3 is plotted on a scale five times as large—i.e., the ordinates for this curve run from 0 to 20% transmission.

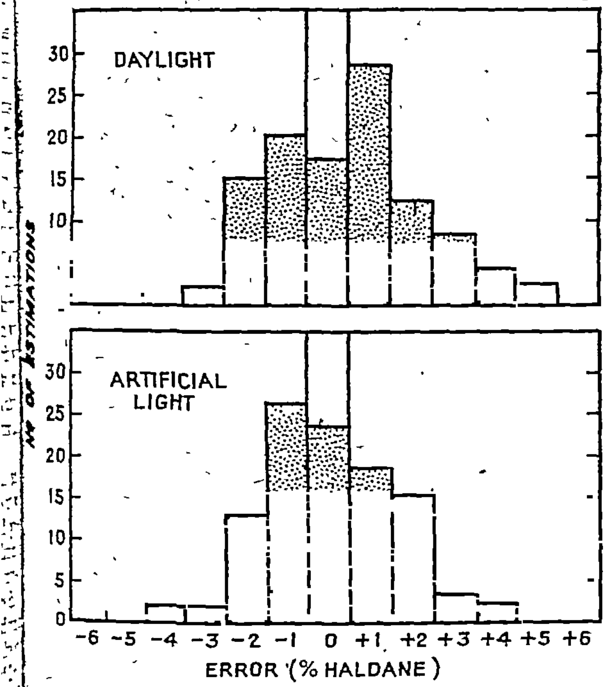

Fig. 3.—Histogram showing the relationship between individual estimates and error.

The “ base-line ” results are given in the accompanying table. Column 1 is the iron analysis, column 2 the Van Slyke oxygen capacity. In column 3 the result is obtained from spectrophotometric absorption measurements at 540 and 560 mμ on the oxyhæmoglobin solutions. The complete spectral curve of these solutions in the visible range was obtained at 10 mμ intervals, and the colour calculated from these curves in terms of hæmoglobin. Results are given in column 4. The data on which these last two methods depend will be presented elsewhere. The results of the Haldane colour comparator are shown in column 5.

Since it was desired to test the performance of the instrument so far as possible under clinical conditions, each observer's five readings were averaged and constituted that observer's estimation of the hæmoglobin value. For each blood sample a grand average was struck of the twelve observers' estimates both by daylight and by artificial light. These grand averages are compared in column 6 with the mean of columns 1, 3, and 4—i.e., the iron determination and the absorption measurements on the same oxyhæmoglobin solutions.

Except for the oxygen capacity results, the agreement is excellent. As shown by King et al. (1948b), oxygen capacity gives results which are a few per cent. lower than those given by the other methods.

It is convenient to present the individual estimates as a histogram. For either daylight or artificial light there are twelve estimates on each of the blood samples. The total 120 estimates are given in fig. 3. It will be seen that in no case is an estimate more than 5% Haldane from the “true” value.

In fig. 4 the comparison of eight observers who remained unchanged throughout the experiment is presented. Each line represents the range within which 90% of the observers' estimates would be expected to fall, and shows that there is no very great individual bias towards high or low results.

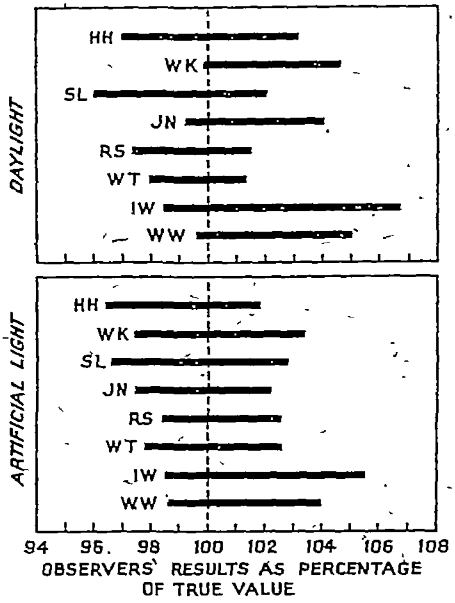

Fig. 4.—The estimated 90% ranges of eight of the observers.

DISCUSSION

The foregoing experiment has confirmed previous findings that the neutral grey-wedge photometer gives results of satisfactory reliability even in the hands of several different observers. It demonstrates also that the commercial version of the experimental instrument, developed during the previous trials, is at least as good in performance as its prototypes, and it therefore seems that it can be recommended for routine use with some confidence.

COMPARISON OF HÆMOGLOBIN RESULTS BY DIFFERENT METHODS

(All values are in % Haldane)

Blood sample		(1) Iron analysis	(2) Van Slyke oxygen capacity	(3) Absorption measured at 540 and 560 mμ	(4) Calculated from total spectrum	(5) Haldane colour comparator	Mean of 1, 3, and 4	(6) M.R.C. photometer (grand average)
1		104·6	100·3	102·2	102·5	101·5	103·1	103·5
2		89·4	86·1	89·5	89·5	89·9	88·8	91·2
3		108·7	104·0	108·3	108·0	108·9	108·3	109·2
4		78·2	75·9	78·5	78·5	78·3	78·4	78·0
5		103·0	98·6	104·5	104·0	104·1	103·7	103·2
6		88·3	86·1	88·5	88·4	87·8	88·4	88·4
7		97·4	94·5	98·2	98·7	97·3	98·1	97·3
8		97·9	95·5	98·7	99·4	97·5	98·7	98·2
9		82·0	78·6	82·0	81·4	81·7	81·8	81·6
10		68·8	67·2	70·0	70·1	68·9	69·6	70·0
Quotient against iron as a percentage	Mean	100·0 %	96·6 %	100·3 %	100·3 %	99·7 %	100·1 %	100·3 %
	S.D.	..	0·81	1·10	1·17	1·06	0·78	0·93

Certain reservations must, however, be made with regard to these instrumental trials as a whole. They have been designed to assess instrumental errors in the estimation of hæmoglobin and the effect of personal differences between observers on the magnitude of such errors. The neutral grey-wedge photometer has been shown to give small variations in the hands of different observers, as compared with other instruments, under the conditions of the trials. This does not mean, however, that in actual clinical practice errors will be restricted to the limits reported here and previously. For instance, venous blood carefully collected and mixed was used throughout in the trials, so that the sampling errors inherent in the collection of successive samples of capillary blood from patients in clinical practice were eliminated. The present experiments had no concern with such errors, but they will inevitably be included in the over-all error of clinical hæmoglobinometry, irrespective of the type of instrument used. Probably, also, during the trials the care and accuracy with which pipetting and other measurements were carried out exceeded the usual clinical standard, and considerable care was taken to see that the glass cells and windows of the various instruments were clean and the solutions used were clear. Relative neglect of such basic precautions in clinical practice will adversely affect any method of estimation, but in particular the high precision instruments will lose much of their advantage over cruder methods if carelessly used.

We therefore feel that, though we have done our best to produce a simple and easily used instrument, reasonable care is essential if this instrument is to give good results.

SUMMARY

Two examples of the commercially produced M.R.C. grey-wedge photometer have been tested for accuracy in hæmoglobin estimations.

In an experiment involving 240 separate estimates no estimate was more than 5% Haldane from the true value.

The eight observers who went through the whole experiment showed no pronounced bias in favour of estimates higher or lower than the true value.

This investigation has been made for the Medical Research Council's subcommittee on analytical methods. The expenses were partially defrayed by a grant from the Medical Research Council, to whom grateful acknowledgment is made. Our thanks are due to Sir Charles Harington, chairman of the subcommittee on analytical methods, for much valuable advice, and to the patient and willing observers. Colour and absorption measurements were carried out at the National Physical Laboratory on behalf of the Medical Research Council.

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. . . We are told that the population of the earth is increasing by 50,000 a day, and that land capable of cultivation is shrinking. . . . On the other hand, we are thwarted in our efforts by shortage of man-power. . . . There are too many to feed and too few to work. So we have those clamouring for higher family allowances and amenities with the hope of increasing the birth-rate, and others calling for contraceptives in order to diminish it.—*Medical Officer*, Nov. 27, p. 235.

DIAGNOSTIC FLUOROSCOPY AT A CHEST CLINIC

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CHEST PHYSICIAN, READING

THE fluoroscopic diagnosis of pulmonary tuberculosis is looked on askance by many experienced physicians. The fundamental objections are threefold: (1) risk of X-ray injury to the observer; (2) lack of a permanent record; and (3) the perceptive limitations of the human eye in dim light.

Bacon and Leddy (1945) found that the risks of irradiation were greater among doctors who used fluoroscopy occasionally than among radiologists specialised in handling X rays. These writers conclude: "Training, common sense, and experience are the most important protective devices, and carelessness and ignorance the commonest cause of injury from irradiation." The proper precautions to be taken are now well known and arrangements can easily be made with the National Physical Laboratory to test quantitatively an operator's degree of exposure to irradiation.

The value of an initial X-ray film showing the extent of disease at diagnosis is obvious when disease is present but this argument does not apply when the findings are normal.

Licht (1936), Bromley (1944), Wright (1944), and Chamberlain (1942) have shown convincingly that the perceptive accuracy of the human eye is diminished in conditions of diminished illumination such as fluoroscopy necessitates, but this does not necessarily mean that perceptive accuracy is so reduced as to affect diagnostic accuracy.

Published opinions of the value of fluoroscopy in the diagnosis of pulmonary disease vary considerably. Reid (1934) emphasised its superiority to physical examination for case-finding. Fellows and Ordway (1937), in a survey of 2300 cases, only detected 87% of the clinically significant lesions which were revealed by X-ray film. Israel and Hetherington (1941) concluded that an observer with moderate experience should be able to detect almost all tuberculous lesions of immediate clinical significance, and they contended that failure to wait for dark-adaptation is the chief factor responsible for poor results. Stiehm (1941), in a series of 423 cases, found 4% more by fluoroscopy than by film. He described a meticulous routine of fluoroscopic examination, and urged the importance of dark-adaptation. Garland (1942) reviewed previous reports rather sceptically, emphasising the varied accuracy experienced by different observers. Hall (1942), in two surveys of factories, screened 1370 workers, mainly women. He found an incidence of 3·5 previously unknown cases per thousand, a figure which closely approaches the results of mass-radiography surveys of civilian populations, and he suggested that in skilled hands fluoroscopy can attain a high degree of diagnostic accuracy. Stauffer (1945) used fluoroscopy to survey 1038 civilian employees in an advanced naval base, and found the technique a useful "sieve" to reduce the number of films taken.

THE READING SCHEME

Every properly equipped chest clinic nowadays has its screening apparatus, even if this is only used for the control of pneumothorax refills. At the Reading clinic the apparatus is a Solus-Schall (design S.S.H.). This has a Levy West fluorescent screen and gives an output of 80 kV from its transformer (used voltage).

Since fluoroscopy possesses two major advantages—cheapness and rapidity of use—it was decided in

September, 1946, to offer Reading practitioners a rapid fluoroscopy service. They were invited to refer any patient for examination and were promised a report by return of post. A simple "request letter" was designed carrying full instructions for the patient, and this is given to him by his own doctor, who writes in the name and address of the patient. A space on the letter is completed by dictation during the examination, and the letter is then posted back to the doctor.

RESULTS

The scheme has proved so successful that it is perhaps of general interest to report the results of the first two years of its operation during which 2908 patients have been screened. This number compares with 723 new cases referred in the usual way in 1945, 875 in 1946, and 750 in 1947. There has therefore been hardly any falling off of patients in this respect because of the additional facility for examination. Of the 2908 patients screened, 90% were discharged forthwith. (Patients found to have non-pulmonary abnormalities were discharged and their further investigation left to their own doctor.) No patient who was passed as normal has subsequently been found to have tuberculosis (any notifications of tuberculosis would come to the notice of the tuberculosis officer). Altogether 314 patients were selected for fuller examination, including appropriate X-ray films. Perhaps this is a high proportion, but every case that was in the slightest degree doubtful was investigated. Of these 314 cases, 83 (26%) were found to have pulmonary tuberculosis, making an incidence of 3% of the total number sent for fluoroscopy. Of the 83 cases with definite parenchymatous tuberculosis, only 32 (39%) had a positive sputum. Thus a substantial proportion of relatively early cases have been discovered in this way.

Since this fluoroscopy service was instituted in the autumn of 1946, 20% of the cases of pulmonary tuberculosis in Reading have been found in this way, and with increasing confidence in the method the number of sessions has been increased to four each week. It is found that about 20 people can be examined in half an hour, a great deal of time is saved, both for doctor and patient, and films are not wasted on normal persons. Thorough visual accommodation is essential, and the writer wears extra-dark glasses for half an hour or so before each session.

SUMMARY

The value of diagnostic fluoroscopy is considered, together with its risks and its accuracy.

A scheme is described in which 2908 people were referred for examination during the past two years by the general practitioners in a town of 100,000.

Pulmonary tuberculosis was found in 3% of cases.

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New Inventions

CALIBRATED ELECTRICAL AID TO FACIAL-NERVE DISSECTION

IN REMOVING PAROTID TUMOURS

THE bold approach to the parotid gland by Hamilton Bailey[1] has led to a new interest in dissection of the facial nerve in cases of parotid tumour. The pattern of the facial nerve is fairly constant, but there are always individual variations brought about through displacement by the tumour itself. Nerve filaments are not always visible, but mechanical stimulation by pinching with forceps may give warning of their presence by producing facial contraction. Unfortunately the injury to the nerve from pinching often prevents further response at the time, and the nerve may be divided without additional warning. Mild electrical stimulation does not impair the function of the nerve and can be repeated indefinitely.

An experimental apparatus was made to give an intermittent direct current variable from 0–9 volts and measurable by a sensitive meter reading from 0–300 microamperes. Interruptions of about 40 per sec. were obtained by using an electric-bell mechanism. This type of current gives a tetanic response in the muscle and is fast enough to give a steady reading on the meter. One electrode was coupled to the patient by a zinc sheet placed under the buttocks, the other by a sterilised lead to a pair of fine-tooth dissecting forceps. A current of 100 μA caused muscular contraction when the forceps were in contact with tissue up to 2–3 mm. distant from a nerve filament.

With this accurately measured current dissection can be carried out speedily, the tissues being picked up gently in the forceps before division, and ample warning is given of approach to any nerve filament by tetanic contraction of the corresponding part of the face.

Such an apparatus has been used in 12 cases of parotid tumour in the last year with conspicuous success. Even the finest filaments can now be easily found and preserved, and the whole pattern can be confidently laid bare with certainty.

In practice the negative lead is coupled to the patient before the operation is begun. When the full skin

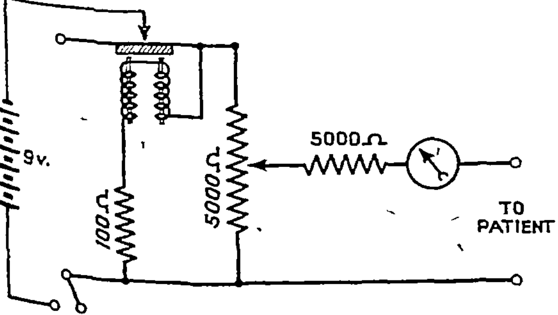

Fig. 1—The circuit.

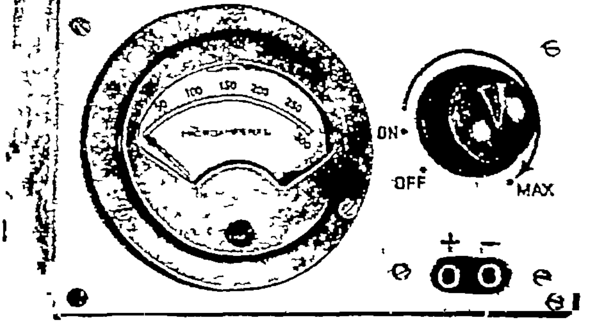

Fig. 2—The apparatus.

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[1] Bailey, H. *Brit. med. J.* 1947, i, 404.

exposure has been made, the positive lead is coupled to the dissecting forceps. An unselected portion of parotid tissue is taken in the tip of the forceps and the current adjusted to exactly 100 µA (owing to polarisation the amount of current flowing diminishes somewhat if the same portion of tissue is held for long). It is essential to make this adjustment at the beginning of each operation owing to variations in resistance of the human part of the circuit. The deflection of the needle on the meter each time the forceps touch tissue indicates that the apparatus is working satisfactorily, and it can be relied on completely.

The apparatus can be made easily by any technician. A good-quality electric-bell mechanism makes a satisfactory interrupter. The power is derived from a standard radio 9-volt grid-bias battery. A 5000 ohm resistance is incorporated in the circuit (fig. 1) to safeguard the meter and the potentiometer, which is also of 5000 ohm resistance. The specially sensitive meter was made by the Weir Electrical Instrument Co., of Bradford-on-Avon. The instrument (fig. 2) is self-contained and compact. The battery can be expected to last for at least twelve months with normal use.

I am grateful to Mr. S. J. Lloyd, a medical student, for making the final model, and to Mr. G. M. FitzGibbon and Mr. R. G. Paul for encouraging me to develop the apparatus and for allowing me to operate on some of their cases.

Bristol.

D. C. BODENHAM
M.B. Brist., F.R.C.S.E.

Reviews of Books

The Skin Diseases

A Manual for Practitioners and Students. JAMES MARSHALL, M.D., consulting dermatologist, Central Middlesex County Hospital; director of venereal diseases clinic, Royal Northern Hospital, London. London: Macmillan. 1948. Pp. 363. 30*s.*

THIS students' manual has been produced as a companion to the same author's work on venereal disease. It nevertheless includes a good section on syphilis; and rightly, for cutaneous manifestations in syphilis are so varied that the dermatologist must have a wide knowledge of the disease, just as the venereologist must be expert on its rashes. There is a small but useful section on the increasingly important subject of industrial dermatitis, as well as sections on eruptions caused by sensitisation to the sulphonamides and penicillin, and on the psychological aspects of skin diseases. The book is well illustrated and the colour plates are fairly accurate. It will be valuable to students and those practitioners who want to have a working knowledge of the subject without going into it too deeply.

Intracranial Tumours

PERCIVAL BAILEY (2nd ed.), professor of neurology and neurological surgery, University of Illinois. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1948. Pp. 478. 55*s.*

THE reappearance of this book is welcome. It is a highly individual account, intended for students but rich enough to be interesting to postgraduates and teachers. Professor Bailey's plan is to select a tumour, to give one or more actual case-histories as told to students, and then to discuss what is known about the behaviour of the tumour, and the prospects of surgical removal. It is a good method; and the emphasis on pathology is such as might be expected from one who has contributed so much to the real understanding of the natures and growth characteristics of brain tumours. Professor Bailey is an observant clinician and an experimental neurophysiologist, as well as a neurosurgeon: on this subject he is probably better armed than any other living teacher. Moreover, he has a sense of humour and a sense of proportion that prevent him from being either dull or eccentric. He writes vividly, sure of his own views, even dogmatic, knowing exactly what he wants to say; and he is no respecter of persons alive or dead. Experts may well wish to challenge some of his statements, or to supplement descriptions; but they can be sure that Professor Bailey has good reasons for his views and selections.

This lively and authoritative book is well illustrated in an original fashion, though some of the drawings are too dark and fussy. Like all Thomas books it is attractive to handle and read.

Functional Cardiovascular Disease

M. FRIEDMAN, M.D., director, Harold Brunn Institute for Cardiovascular Research, Mount Zion Hospital San Francisco. London: Baillière. 1948. Pp. 266 16*s.* 6*d.*

THIS book deals with Da Costa's syndrome, or effort syndrome, which is now generally regarded as an expression of psychological disturbance. Colonel Friedman after marshalling the evidence, including his own, suggest that it is the result of a corticohypothalamic imbalance It therefore seems a mistake to use the words "cardiovascular disease" in any description of this syndrome even when qualified by the adjective, "functional" for an essential part of the treatment is to convince the patient that there is no disease of the heart or blood vessels themselves. Though rather discursive, the book gives a comprehensive account of the symptoms, diagnosis, and treatment of the condition, with many original observations of particular interest to the psychiatris and cardiologist.

Management in Obstetrics

ANDREW M. CLAYE, M.D., F.R.C.S., F.R.C.O.G., *professo* of obstetrics and gynæcology, University of Leed London: Oxford University Press. 1948. Pp 18 12*s.* 6*d.*

IN this short book Professor Claye describes wha he himself has found to be the best and omits muc that is generally accepted. It seems a pity then tha he should waste a page on external pelvimetry, whic he himself often finds misleading. The figure (28 % given for the infant mortality in breech birth is too high and too little emphasis is laid on the value of intravenou ergometrine in the treatment of postpartum hæmorrhag though the use of the extract of the posterior part of th pituitary gland is repeatedly advocated. Such objections however, are less important than the good and soun help given throughout the work. The sections on th retroverted gravid uterus, fibroids in pregnancy, and th management of antepartum hæmorrhage, of the firs stage of labour, and of the occipitoposterior position, a particularly good; and the delightful chapter headings are not only amusing but instructive.

General Cytology

E. D. P. DE ROBERTIS, department of biology Massachusetts Institute of Technology; W. W NOWINSKI, department of anatomy; FRANCISCO A SAEZ. Philadelphia and London: W. B. Saunders 1948. Pp. 345. 27*s.* 6*d.*

THIS book was first written in Spanish for Latin America, and Dr. Warren Andrew has now translated it into English. The final result is praiseworthy; both writing and arrangement are clear. The text describes both the principles and the practice of modern techniques such as electron microscopy, X-ray diffraction analysis and ultramicrorespirometry, instead of assuming that the reader has an intuitive understanding of how these things work. Contrary to British convention, nuclear cytology and chromosome mechanics have been included as well; there is no reason why they should not be there, except that the goings-on of chromosomes do not really make functional sense without a fuller background of Mendelian theory than the authors have been able to provide. The book can be strongly recommended.

The Medical Annual (Bristol: J. Wright. 1948. Pp. 368. 25*s.*) has reached its sixty-sixth year in good style. Sir Henry Tidy and Prof. A. Rendle Short, the editors, again review in their introduction some topics of special interest, such as the poliomyelitis epidemic, the use of B.C.G. vaccine, sea-sickness, streptomycin, and advances in surgical techniques. The main text is again provided by a body of distinguished contributors.

THE LANCET

LONDON: SATURDAY, DEC. 18, 1948

No Room at the Hospital

In the early months of next year the general practitioner is going to find it very hard to get any elderly patient into hospital. Though the winter has hardly begun, it is already difficult to secure a bed for anyone who is likely to occupy it for a long time. The fact that the patient cannot be satisfactorily nursed at home makes little difference to the prospect of admission; for resident medical officers of general hospitals, remembering the need to keep room for acute cases, are obliged to deafen their ears to appeals on behalf of those who cannot be expected to recover quickly, while the wards for the chronic sick seldom have vacancies. There are too few beds in commission, usually because nurses cannot be spared to serve them. And unfortunately some local authorities have so far been unable to organise the kind of home nursing that would enable many of the patients to be treated decently in their own beds.

What is to be done? We know that pioneers in this field such as Dr. MARJORIE WARREN and Dr. L. Z. COSIN get good results by treating acutely ill old patients vigorously in short-stay wards. Their long-stay wards are reserved for those who cannot be made fit enough to go home; and these are surprisingly few. Such thorough treatment not only spares hospital beds but also saves lives and reduces chronic illness. We have to admit, however, that lack of trained staff, and building difficulties, make it unlikely that this system will be widely adopted in the very near future. Another line of approach is that of Dr. E. B. BROOKE, at St Helier Hospital, Carshalton. When lack of a bed obliges him to refuse an old person admission he sends a geriatric social worker to visit the home and assess the circumstances. Sometimes it then proves possible to arrange active treatment—often in the form of physiotherapy—from the hospital, and to send the equipment needed to make the old person more comfortable. This recalls the former arrangement by which district medical officers, attached for the purpose to certain general hospitals, undertook the same kind of outdoor treatment. When a general practitioner applied for the admission of an old person, the district medical officer would visit the patient in his home, with authority to provide what was necessary; and for this he could call on the hospital resources, including if necessary such items as oxygen cylinders and air mattresses. Often the old person could thus be tided over the acute phase of an illness, while at the same time the hospital's beds were kept free for short-term cases. It has been suggested that the virtual disappearance of district medical officers under the National Health Service Act has deprived many old people of the only type of hospital care—albeit given outside the hospital precincts—which they could count on getting. The new authorities would do well to consider the possibilities of reviving this type of service, in a form acceptable to the practitioner responsible for the patient's care. Where his remuneration is based purely on capitation, the practitioner's financial interest lies in transferring the patient to hospital rather than in giving him continual attention at home; and this is an element in the situation that should not be overlooked, especially at a time when the strain on general practice is great. But where it is clear that admission is out of the question, practitioners in general would welcome an arrangement whereby some of the resources of the hospital were brought to the patient. Such resources exceed those at the disposal either of the family doctor or of the district nurse; for example, physiotherapy must generally be undertaken by the hospital or not at all. The fact remains that often the chief need of the patient, or that of his family, is for more domestic aid; and we are glad to know that the home-help service is beginning to make progress—at any rate in London, where it is already four times as busy as it was in July. The secret of success in this department is to appoint a keen and able organiser who will get to know the team of workers in her district and see that they find their conditions of work satisfactory; they then act as recruiting sergeants among their friends.

The question also arises whether it would not be possible, during the coming danger period, to reopen some of the closed wards of hospitals, staffing them, on a temporary basis, with part-time nurses and helpers. It is usual nowadays to say that the part-time scheme is played out in London, and that the response, for various reasons, has never been as enthusiastic as, for instance, in Gloucestershire. But comments reaching us from qualified nurses who have tried to do part-time work in London suggest an important and remediable reason for this failure: the part-timers have not as a rule been made to feel that *they were the staff*; they have been regarded from the outset as supernumeraries. The success of the Gloucestershire scheme is largely due to the sense of responsibility that the part-timers have been encouraged to develop. They have known that they were the actual staff of the hospitals, and they have responded as people do to positions of responsibility and trust. We believe that special appeals, in each area, inviting women to give temporary care to the old—until, say, the end of April—might meet with a generous response, especially if it was made clear that the wards opened for this purpose would be staffed and managed entirely by part-timers—some of whom of course would have to be State-registered nurses. As a short-term policy this is certainly worth trying; for its success would prevent a great deal of misery.

Twenty Years of Pregnancy Tests

TWENTY years have passed since Aschheim and Zondek[1] revolutionised pregnancy diagnosis by devising an early and reliable test; and in that time at least twenty other methods have been evolved. They fall into two groups—those performed on the patient herself, and those in which her blood or urine is investigated.

Ideally a test for pregnancy should be reliable, convenient, simple, and speedy; and those involving the patient's participation fall short of the ideal if they are irksome or require her to visit anyone but her own doctor. Some of the seven "direct" tests depend on novel and ingenious principles. For instance, the Bercovitz test[2] consists in instilling into the patient's conjunctival sac 5–6 drops of her blood diluted with 1 drop of normal saline; if she is pregnant the pupil will either dilate or contract, and its size may be compared with that of the other pupil. Unfortunately it seems to be by no means specific, for some workers have reported an error of over 50%. The 'Antuitrin-S' test was introduced by Gilfillen and Gregg[3]: in pregnant women the intradermal injection of this gonadotrophic hormone does not produce the customary flare. This too has been found to be uncertain. Smith and Brunner,[4] making use of the histological changes in the vaginal mucosa during pregnancy, used vaginal biopsy as a method of early diagnosis. This has the disadvantage of being unsuitable for a busy surgery; paraffin sections have to be examined by a morbid anatomist; and any pathological modification of the vaginal mucosa, as in chronic vaginitis, may vitiate the end-point. All these tests certainly have the merit of speed, for both the Bercovitz and the antuitrin-S reactions may be obtained in the course of a consultation, and it should be possible to have the histologist's report on the vaginal biopsy on the following day. More time is needed for tests in which the production of uterine bleeding indicates that the patient is not pregnant. The first of these was the 'Prostigmin' reaction.[5] With delayed menstruation not due to pregnancy, injection of 1 mg. of prostigmin on 3 successive days leads to uterine hæmorrhage within 72 hours. Cases have to be carefully selected, however, for the bleeding response may be absent at the menopause or in women with a history of menstrual or endocrine disorder; and even so the test is only 90–95% accurate in the absence of pregnancy. A test recently described by Garrett[6] depends on inducing withdrawal bleeding in non-pregnant women after three injections of 1 mg. of œstrone in oil on alternate days. Use of an œstrogen that is active when given by mouth would make the procedure more convenient; but unless the cases are very carefully chosen false positive results are likely. Gediz[7] gives progesterone 10 mg. daily for 5 days, which in the non-pregnant causes withdrawal bleeding within a week of the last injection. A different principle is involved in the use of basal temperature records to indicate the onset of pregnancy. If the postovular rise in temperature, due to the action of progesterone, is maintained for more than three weeks, pregnancy is almost certain. This method is simple and less irksome, but is applicable only when pregnancy has been planned and the patient has kept temperature records since the beginning of the previous period.

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[1] Aschheim, S., Zondek, B. *Klin. Wschr.* 1928, 7, 8.

In the second group, tests are made on the patient's urine or blood. Blood tests are obviously the less popular, and the one we shall mention is of academic rather than practical interest. In pregnancy it is possible by the seventh week after the last period to demonstrate—by assay on strips of guineapig intestine—an increase in the histaminolytic power of the patient's plasma.[8] The rise can be directly related to the stage of pregnancy, and Ahlmark claims that the commencement of pregnancy can be dated to within about 6 days, especially at the third month. Urinary tests depend on either chemical or biological methods. None of the chemical reactions is as accurate as the better-established biological tests. The bromine test of Voge,[9] based on the presence of histidine in the urine of pregnant women, was simple, cheap, and rapid, but unfortunately gave 25% false negative and 13% false positive results. This test, the first of the chemical tests in the post-Aschheim-Zondek period, was modified by Kappeller-Adler,[10] but still did not reach the necessary degree of accuracy. Another reaction of similar nature was that of Visscher and Bowman,[11] but this showed a 10% error. Chemical tests depending on the rapid increase in concentration of œstrogens in the urine during pregnancy have also been devised. Typical of these was the method of Schmulovitz and Wylie,[12] which involved the collection of inconveniently large quantities of urine and a complicated laboratory technique; the colour reaction was, however, not specific for œstrogens. Patterson's technique[13] was founded on the Kober phenolsulphone colour-reaction for œstrogens, œstriol being liberated from its glycuronide by means of bacterial hydrolysis, the products of which did not mask the Kober colour reaction as happens when the glycuronide is hydrolysed by strong acid. The method is laborious, and the reaction is dangerously weak in the earliest stages of pregnancy. The principle of the Guterman test[14] is the excretion of pregnanediol in increased quantities during pregnancy, but Guterman himself claimed only 93% accuracy, and Reinhart and Barnes[15] found a 25% error. Much seems to depend on the level of pregnanediol excretion chosen as the diagnostic base-line.

Thus no satisfactory physical or chemical test has yet been devised for the early, simple, and efficient diagnosis of pregnancy; and it therefore becomes necessary to resort to biological responses to administration of urine. Here the choice of animal and the speed and simplicity of technique are important considerations. For instance the method of Konsuloff,[16] based on expansion of the melanophores and consequent darkening of the skin, has the disadvantage that the test animals are hypophysectomised frogs. Brouha's reaction,[17] depending on enlargement of the seminal vesicles of male mice or rats, was laborious in that ten daily injections were necessary; nor did it prove as accurate as the classical Aschheim-Zondek, Friedman,[18] and xenopus[19] tests, which reach an accuracy of 99% in skilled hands. The last-named has the advantage that the result, if positive, can be obtained in a few hours and, if negative, within 30 hours. Xenopus, however, is not indigenous to this country; the toads must either be imported from South Africa or bred here—a lengthy and

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2. Bercovitz, Z. *Amer. J. Obstet. Gynec.* 1933, **25**, 882.
3. Gilfillen, G. C., Gregg, W. K. *Ibid*, 1936, **32**, 498.
4. Smith, B. G., Brunner, E. K. *Ibid*, 1937, **33**, 404.
5. Soskin, S., Wachtel, H., Hechter, O. *J. Amer. med. Ass.* 1940, **114**, 2090.
6. Garrett, S. S. *Amer. J. Surg.* 1948, **76**, 261.
7. Gediz, M. A. H. *Türk. Ginekologi Arsivi*, 1945, **11**, 1439.
8. Ahlmark, A. *Acta physiol. scand.* 1944, **9**, suppl. 28; *Lancet*, 1944, ii, 406.
9. Voge, C. I. B. *Brit. med. J.* 1929, ii, 829.
10. Kapeller-Adler, R. *Klin. Wschr.* 1934, **13**, 21.
11. Visscher, J. P., Bowman, D. E. *Proc. Soc. exp. Biol., N.Y.* 1934, **31**, 460.
12. Schmulovitz, M. J., Wylie, H. B. *J. Lab. clin. Med.* 1935, **21**, 210.
13. Patterson, J. *Brit. med. J.* 1937, ii, 522.
14. Guterman, H. S. *J. clin. Endocrinol.* 1945, **5**, 407.
15. Reinhart, H. L., Barnes, A. C. *Ibid*, 1946, **6**, 664.
16. Konsuloff, S. *Klin. Wschr.* 1934, **13**, 776.
17. Brouha, L., Simmonet, H. *C. R. Soc. Biol.* 1929, **101**, 368.
18. Friedman, M. H. *Amer. J. Physiol.* 1929, **90**, 617.
19. Bellerby, C. W. *Nature, Lond.* 1934, **133**, 494.

specialised task. In the Friedman test the result is known in 2 days, but the rabbits needed for it are expensive; they have to be bought from a reliable dealer to ensure that they are neither too young nor too multiparous to respond. The Aschheim-Zondek test calls for multiple injections of mice, which are easily bred in suitable animal houses: but the result is not known in less than 5 days. The Galli Mainini test,[20] on which Dr. Haines reported last week,[21] employs male toads and has the advantages of fairly simple laboratory technique and rapid reading of results with a high degree of accuracy. The disadvantage is that the male toads he used are indigenous to America, and must be imported—though they appear simple to keep, feed, and handle. Hinglais and Hinglais,[22] however, have used one of the frogs commonly found in France (*Rana esculenta*) with equally good results. Another rapid method is the ovarian hyperæmia reaction;[23] within 6 hours of subcutaneous injection of pregnancy urine the ovaries of the immature rat become conspicuously hyperæmic. Salmon and his associates have claimed 99% correct results at 6 hours; and a modification has yielded equally good results in the hands of Zondek, Sulman, and Black,[24] though only after 24 hours.

Thus at present biological tests hold the field; and these involve animal housing and Home Office licences, as well as the careful technique essential for close on 100% accuracy. The day has not yet arrived when the doctor can tell his patient that she is pregnant by pouring her urine into a tank of fish and watching their bellies become red; though this was the great expectation which the male bitterling at one time held out.

Criteria for Hospitals

Too little is known in this country about the influence on hospitals exerted for the past thirty years by the American College of Surgeons. To qualify for inclusion on the college's approved list, the hospitals have to reach certain standards; and the desire to qualify has greatly improved their organisation, equipment, and performance. Indeed Dr. E. H. L. CORWIN is probably right in saying that the college's programme "more than any other single influence has been responsible for salutary results in the efficiency of hospital work in the United States." When this programme was started in 1918, the college found that only about 13% of 692 large hospitals met all its requirements. But regular inspection continued, and the hospitals accepted it because of the benefit they could gain. The approved list is published annually by the college in the local press of the community concerned, and the hospitals on the list automatically gain public recognition. By 1932, Dr. RICHARD H. SHYROCK writes, "the percentage of hospitals either wholly or conditionally approved was quite high for all save the smallest type." The official survey is undertaken by doctors, paid by the college, who visit hospitals at intervals and also maintain contact through returns and correspondence. The many people in Great Britain who now find themselves visiting hospitals on behalf of boards and committees will be particularly interested in the new point rating system[1] which the college has introduced as a further incentive to the hospitals on its list. This system will be used by the assessors, and it is also suggested that hospitals should themselves use the form as a means of judging their own progress. No departure is intended from the standards laid down in the *Manual of Hospital Standardisation*, but the new method is intended to enable hospitals to take a more active part in meeting the college's requirements.

The report to be made by the assessors falls into two main sections—essential divisions, and adjunct and service divisions. The maximum points obtainable are:

Physical plant, 20; administration, 35; medical staff organisation, 250; medical record department, 150; clinical laboratory, 95; X-ray department, 50; nursing service, 35; dietary department, 20.

Total for essential divisions 655

Medical department, 50; surgical department, 125; obstetrical department, 75; anæsthetic department, 30; physical-therapy department, 15; school of nursing, 15; outpatient department, 10; pharmacy, 10; medical social-service department, 10; occupational-therapy department, 5.

Total adjunct and service divisions .. 345

Grand total 1000

The high rating for the medical staff organisation and the medical record department (as contrasted, for example, with the nursing service and the school of nursing) reflect the special interests of the college. Reference to the detailed headings under medical staff organisation shows that the greatest emphasis is placed on the following questions:

> Are medical staff meetings held at least monthly? (12 meetings a year required.) (*a*) Number of meetings? Average percentage attendance? (75% average attendance is minimum requirement for full score). (*b*) Average duration of medical staff meetings? (2 hours should be considered minimum to cover clinical review).
>
> Are minutes of the medical staff meetings recorded in sufficient detail and do they show a thorough review and analysis of the clinical work as under by (*a*) Discussion of medical administrative problems? (*b*) Review of selected patients in the hospital at the time of the meeting? (*c*) Review of selected cases discharged since the last meeting? (Here should be included consideration of selected deaths, unimproved cases, infections, complications, errors in diagnosis, and results of treatment.) (*d*) Analysis of clinical reports from each department? (*e*) Reports of committees? (*f*) Discussion and recommendations for the improvement of the professional work in the hospital?
>
> Are major clinical departmental meetings held regularly, weekly, bi-weekly, or monthly throughout the year?

The emphasis on the medical record department is also strong, and includes searching queries:

> Do the medical records contain the following information: identification data; complaint; present illness; past history; family history; physical examination; consultations; clinical laboratory; X-ray reports; provisional diagnosis; tissue report, (1) gross, (2)

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[20] Galli Mainini, C. *Sem. méd. B. Aires*, 1947, 54, 337.
[21] Haines, M. *Lancet*, Dec. 11, p. 923.
[22] Hinglais, H., Hinglais, M. *C.R. Acad Sci., Paris*, 1948, 226, 1041.
[23] Salmon, U. J., Geist, S. H., Salmon, A. A., Frank, L. L. *J. clin. Endocrinol.* 1942, 2, 167.
[24] Zondek, B., Sulman, F., Black, R. *J. Amer. med. Ass.* 1945, 128, 939.

[1] Hospital Standardisation Scoring Report. Obtainable from the Physicians' Record Company, 161, West Harrison Street, Chicago 5, Illinois. Pp. 17. 50 cents. Reduced prices for larger quantities.

> microscopic; treatment (medical and surgical); final diagnosis; progress notes; condition on discharge; autopsy findings?
>
> Who is head of the medical record department? Is the head (*a*) Registered? (*b*) Trained but not registered? (*c*) Provided with sufficient assistants?
>
> Are records written promptly after admission of the patient and are they signed? (24–48 hours is considered limit of promptness.)
>
> Is there an active record committee of the medical staff? (*a*) If active, does it control the calibre of the records? (*b*) Are all records examined by the committee before filing?

It is tempting to go on picking out questions which here as in America touch some sensitive spots:

> *X-ray department.*—Are the reports of interpretations in writing or dictated; and signed by the radiologist? Are requisitions for X-ray examinations in writing?
>
> *Medical department.*—Do the records justify the diagnosis and treatment (*a*) By a sufficiently complete history and physical examination? (*b*) By sufficient laboratory and other diagnostic tests?
>
> Are consultations required, under the medical staff rules and regulations, in all serious cases; and are they always recorded?
>
> Has the department (*a*) An electrocardiograph, with a member of the medical staff qualified to interpret electrocardiograms? Name? Qualifications? (*b*) Equipment for the estimation of basal metabolic rates?
>
> *Surgical department.*—Is sterilisation of surgical supplies and water adequately tested by any of the following methods?: (*a*) recording thermometer on the discharge line; (*b*) fusion tubes, such as Diack controls; (*c*) colour indicators, such as sterilometer; (*d*) periodic cultures: how often? (Diack controls in each batch plus frequent culture checks at least monthly, should be made. Recording thermometer, either lag or clock, is considered the best check.)
>
> Do the surgical records justify the diagnosis and operation by (*a*) Sufficient recorded evidence of preoperative study? (*b*) Record of surgeon's preoperative diagnosis? (*c*) An operation report, signed by the operating surgeon, of the findings and technique, written or dictated immediately following the operation?
>
> Are all infections of clean surgical cases routinely: Recorded and reported to administration? Listed? Where? Investigated? By whom?

Enough has perhaps been quoted to show that a systematic review of this kind by an independent authority can be a real stimulus to progress, and that members and officers of the regional boards would find it useful to have a copy of this scoring sheet in their pocket as they are going round the regions. Indeed they might go further, and themselves compile a modified list of questions more directly applicable to conditions in hospitals in this country. In the United States the attention concentrated by the American College of Surgeons on a definite medical staff organisation for each hospital, on the keeping of accurate clinical records, and on the provision of diagnostic facilities, has done nothing but good. But the merits of the system should not blind us to its limitations, and it might be improved so as to cover better those aspects of hospital life that are of less immediate concern to the medical profession. Note has been taken of the slight emphasis placed by the system on the nursing services; and it is surprising to see that such a question as

> Is the general atmosphere of the hospital (*a*) Pleasant with cheerful wards? (*b*) Suggestive of a reasonable amount of interest in the patient?

is awarded only 5 points in a total of 1000.

The system of hospital visiting introduced in London by King Edward's Hospital Fund, with its emphasis primarily on the lay and administrative aspects (not forgetting the amenities for the patients and for the staff) has been a potent factor in raising standards not only in London but indirectly throughout the country. Among the subjects to which the King's Fund has given attention in recent years are several which have led to widespread changes. Its well-known reports on hospital catering were initiated by inquiries made to visitors, as also were the report on the supervision of nurses' health, and the health record forms now used by many hospitals for their staff. Among the latest examples is a movement for the provision of a modern type of interior-spring or rubber mattress for the comfort of patients; and "comfort of patients" is a heading that has appeared repeatedly in the handbooks used by the Fund's visitors. In these and similar respects the American system is deficient. But a combination of the two systems might well give us an entirely satisfactory scheme of approach for all those now responsible for maintaining or improving hospital services. Furthermore, periodic surveys of the hospitals on these lines—possibly conducted by some non-official body sponsored by the Royal Colleges—might provide material for comprehensive reports to the Central Health Services Council and to the public. These reports would show how far the hospitals are able to realise current ideas of what they ought to be.

Annotations

NUFFIELD COLLEGE OF SURGICAL SCIENCES

Lord Nuffield's gift of £250,000 to the Royal College of Surgeons, which was announced last week, has been made "for the promotion of research and education in the surgical sciences, and in order to increase facilities for young surgeons from the Dominions, the United States, and other countries, who come to Britain for advanced studies." These general terms Lord Nuffield has translated into more concrete suggestions for a residential college to be attached to the Royal College, where students will have easy access to museums, library, and laboratories, and in their collegiate life opportunities to meet their teachers and seniors outside the operating-theatre and the lecture-room. Here, too, distinguished visitors from abroad will find a congenial centre. Though the foundations of the new Nuffield College have yet to be laid, it will soon have at least a partial existence, for the scheme is an extension of the experiment which the college are making in the New Year of providing in an adjacent house residential accommodation and common-rooms for 20 postgraduate students. Through the Sims travelling professor the college have already made fresh contacts among their colleagues abroad, and this gift will enable them to receive hospitably their new and old friends who come to pay a return visit. In welcoming Lord Nuffield to their honorary fellowship the college have recognised his many stimulating services to medicine, of which this latest gift is yet another example.

HYPNAGOGIC HALLUCINATIONS

SINCE the Pharaohs, and especially since Freud, dreams have been studied by soothsayers and psychiatrists. The similarity between dreaming and madness has often been pointed out; less attention has been paid to the peculiar states that characterise the transition between sleeping and waking. Familiar as they are to a majority of people, the "hallucinations" of the hypnagogic state, and the other normal disturbances of thinking and sensation which occur in falling asleep or in waking are sometimes misconstrued by doctors, who mistake for symptoms. They are also, as a letter from a correspondent elsewhere in this issue shows, sometimes alarming to the patient.

Hypnagogic hallucinations have been pretty widely recognised and investigated since Maury's report of 1861. Disturbances of the body image, however, during the hypnagogic or hypnopompic transition, have seldom been studied. They occur fairly often, and as good a description as any was provided by Paul Federn, the psychoanalyst. The body, he pointed out, seems to become flat and two-dimensional, and its surface may be distorted in many directions. The distance between symmetrical parts can appear enormously increased, as can many other bodily proportions. Parts of the body may seem normal while the rest becomes a vague mass, either much diminished or much enlarged. Sometimes the body seems to end at the bottom of the trunk, or at the knees; on the other hand, parts of the middle of the body may disappear. The borderline of the body in one direction may become blurred, and may seem to move in this direction. The face and head are usually spared from any distortion, as are also those parts of the body which are fully supported on the bed. Paul Schilder likewise described such phenomena; for example, one of his patients felt, as she was falling asleep, that she became smaller and smaller, until she was only a few centimetres long. Schilder drew attention to the similarity of this experience to those which may occur in dreams and in the first stages of hypnosis. The similarity to certain intoxications from mescaline is also striking. Not everyone would be disposed to go as far as Schilder in interpreting these phenomena in psychoanalytical terms, and relating them to the libidinal structure of the body image. Few, however, would contest their relevance to the problems of self-perception which are of much interest to neurologists and psychiatrists alike.

INCIDENCE OF DIPHTHERIA

In his report for 1947 on the Seacroft Hospital, Leeds, Dr. E. C. Benn records that of 121 patients admitted with a notified diagnosis of diphtheria only 42 had clinical attacks (36 faucial and 6 simple nasal infections), while another 10 proved to be healthy carriers. In the confirmed cases (including carriers) with a history of immunisation recovery was rapid and uncomplicated.

Ten years ago the medical superintendent of a large fever hospital could not have reported such modest figures. Without doubt the main agent in the decline has been mass immunisation, though even now the success achieved years ago in many American and Canadian cities is not paralleled here. Martin[1] points out that diphtheria mortality began to fall at the beginning of this century. This was due mainly to improved hygiene and treatment, and particularly to the introduction, in 1895, of antitoxin—which has since been improved and is now administered more intensively. Nevertheless, considering that the ætiology of the disease had long been known, the downward trend was disappointingly slight until 1940 when, with the start of mass immunisation the fall quickened; in 1946 mortality was less than a fifth of what might have been expected with the previous slower decline. The number of cases notified each year has fallen from an average of 60,000 (uncorrected) in the pre-immunisation years to 10,500 (corrected) in 1947. The decline in mortality has been still more rapid, partly owing, as Martin says, to the better chance of survival of the previously protected when they contract clinical diphtheria. As a cause of death the disease has fallen from third to sixth place in the 1–5 years age-group, and from first to third place in the 5–10 age-group. Improvement, however, is not uniformly good; during the last year or two there have been small localised outbreaks in the North and in Wales, due either to local variations in the extent of immunisation or to real regional differences of the sort that was recognised in pre-war years. The decline in the attack-rate has been most rapid in London; whereas in 1937–38 the rate here was 28% above the rate for the whole country, in 1946–47 it was 12% below the general rate. In nearly all "density areas" incidence was considerably lower in 1947 than in 1946. Martin observes that, as might be expected, the preschool child and the adult were relatively more often attacked in 1947 than in 1944; the greatest fall in the attack-rate has been in children aged 10–15, among whom the rate in 1947 was only a fifth of that in 1944. This is a reversal of the previous pattern throughout this century. As to sex incidence, the attack-rate is still much higher in adult females, but the difference is now less than it was, especially at age 25 or over.

The aim is to increase the percentage of immunised children to at least 75, and efforts should be concentrated particularly on the protection of infants under one year. With a larger initial dose of the prophylactic (0·5 ml. A.P.T.) and reinforcing doses (0·2 ml. A.P.T. or 1 ml. T.A.F.) midway between infancy and school age and again at school entry, diphtheria is likely to become still more rare.

BLOOD-PRESSURE AND THE SUPRARENAL CORTEX

MANY years ago, when it first became clear that the suprarenal had some part in the production of hypertension, the association seemed fairly straightforward. French workers, for instance, claimed that hypertension was accompanied by hypertrophy of the gland. This was not confirmed, and attention shifted to adrenaline itself. Then it emerged that the simplicity of the problem was illusory; for some twenty years ago the reports of Rogoff and Stewart[1] and of Hartman and his colleagues[2] revealed the vital rôle of the cortex, and within ten years the brilliant research of American[3] and Swiss[4] workers culminated in the isolation and synthesis of a series of cortical hormones. Of these the most important was desoxycorticosterone with its specific action in raising the blood-pressure.[5] The intensive work on Addison's disease prompted by observation of the potent action of cortical extracts in this previously fatal condition, brought to light the prime importance of the sodium and potassium ions; and it was immediately asked whether the blood-pressure changes in Addison's disease were due directly to lack of cortical hormones or to disturbance in the electrolyte pattern of the tissues. This question was almost immediately overshadowed by the experimental observations of Goldblatt and his associates on the effect of renal ischæmia in producing hypertension.

Probably what we vaguely describe as essential hypertension is a collection of conditions. Four factors clearly take leading parts—adrenaline; one or more of the hormones of the suprarenal cortex; the sodium and potassium ions; and renin—but how these factors combine in any one case no-one can tell. Perera and his colleagues[6] have reported the development of hypertension in 8 out of 24 patients with Addison's disease under protracted treatment with desoxycorticosterone acetate. As an interesting corollary, Perera[7] has recorded the case of a hypertensive patient who developed Addison's disease; with desoxycorticosterone therapy the hypertension continued, but when the condition was treated with salt alone the blood-pressure fell to normal, even though with both treatments a normal serum-sodium was maintained. He has also shown: (1) that while the subcutaneous administration of desoxycorticosterone acetate for a week to normotensive patients had no effect upon the blood-pressure, its administration to hypertensive subjects for 1–4 days raised the pressure[8]; and (2) that this pressor action in hypertensive subjects was prevented by the rigid restriction of sodium-chloride intake, which also caused a slight decrease in "resting" blood-pressure.[9] The pressor action of desoxycorticosterone acetate in hypertensive patients has been confirmed by Goldman and Schroeder,[10] who gave this substance intravenously. They also found that in normotensive subjects it had no effect upon blood-pressure. Selye[11] noted in desoxycorticosterone-treated animals an increase in the serum sodium/chloride ratio; he later observed this increase in some hypertensive but never in normotensives. Arising from this he recorded apparent benefit from the treatment of hypertension with ammonium chloride 6 g. daily, particularly where the serum sodium/chloride ratio was raised. Finally Grollman[12] has reported that in 4 out of 6 hypertensives a severely restricted salt intake causes a fall in blood-pressure.

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[1] Martin, W. J. *Mon. Bull. Min. Hlth P.H.L.S.* 1947, 7, 232.

[1] Rogoff, J. M., Stewart, G. N. *Science*, 1927, 66, 327.

[2] Hartman, F. A., MacArthur, C. G., Hartman, W. E. *Proc. Soc. exp. Biol., N.Y.* 1927, 25, 69.

[3] Mason, H. L., Myers, C. S., Kendall, E. C. *J. biol. Chem.* 1936, 116, 267.

[4] Steiger, M., Reichstein, T. *Helvet. chem. Acta*, 1937, 20, 1164.

[5] Soffer, L. J. Diseases of the Adrenals. London, 1946; p. 215.

[6] Perera, G. A., Knowlton, A. I., Lowell, A., Loeb, R. F. *J. Amer. med. Ass.* 1944, 125, 1030.

NEW PROSPECTS IN THE YOUTH MOVEMENT

"... . youth work is properly regarded as a form of preventive and constructive social medicine providing a cultural health service. It is one part among many parts of the systematic effort which our society makes to stop the transmission to the new generation of the cultural disorders of the old . . . ."

In *The Outlook for Youth Work*,[13] Mr. L. J. Barnes develops his theme with vision and passion. Young people in our uneasy day need to learn to carry freedom, and freedom he conceives as something other than the absence of formal restraints: man can develop himself only by helping to develop the human community, he believes, and many of our difficulties and disasters can be traced to "our forbears' absurd identification of individual freedom with absence of agreed social purpose." The young are faced with a society in which three trends are discernible: social groups may advance beyond freedom in its negative form (absence of restraint) to freedom in a positive form; or, by blind submission to a leader, they may be released from the alarming isolation which negative freedom begets; or they may conform compulsively to accepted patterns—a sort of automatism which some, he says, find typical of Western democracy. In this country we are groping towards more positive forms of freedom, as witnessed by measures of social security and economic planning; and in the task of helping young people to grow towards the ideal of positive freedom the youth organisations have a great chance, and a great responsibility.

Mr. Barnes has some free and positive ideas on the way they should set about it. He suggests that the voluntary organisations should now combine to form a Central Research Council for Youth Welfare to study the best means of providing the young with an opportunity to grow fully, as nature intends them to do, into people whose behaviour is "whole-hearted or whole-natured, as proceeding from a personality not divided against itself and not disorganised by feelings of guilt, inferiority, isolation, or fear." He calls such behaviour "spontaneous" because it is "immune alike from the anxieties of automatism and the obsessions of fascism, and is neither hysterical nor compulsive." Youth workers, he thinks, must learn that preaching does not pay, and that it is better to start from the belief that, given appropriate conditions, people can achieve the spontaneity and integrity which enable them to find the good life. But we need to know much more about the conditions which favour such personality growth, and hence the need for research.

He is perhaps asking rather much of the harassed—and voluntary—youth workers, as Dr. J. Macalister Brew points out in *Social Service*.[14] They are not numerous, and they already work exceedingly hard. Their anxiety has also been roused by Mr. Barnes's encouragement to them to forget some of the old destruction between official and voluntary agencies. Nevertheless, Mr. Barnes is surely right in saying we must find out about these things; and the youth service "already possesses the research material and the laboratory space, namely the young people in clubs and units." One practical experiment could be tried immediately: the youth service, though it always favours fresh air and exercise, has never paid much attention to the diet of its members. He proposes that clubs might join together, in scientific farming enterprise, to produce whole-wheat flour, milk from tuberculin-tested and attested herds, and fruit and vegetables. It would mean a business alliance between urban clubs, and bring them into collaboration with Young Farmers' Clubs and other rural organisations. On the long view, he suggests that the youth service should be extended to cover all ages between 7 and 25, the young people being grouped as juniors from 7 to 16 (or 14) and seniors from 16 (or 14) to 25. Like barristers taking silk, they would be at liberty to choose when they were ready to move up.

THE KING'S HEALTH

LAST Monday the following bulletin was issued from Buckingham Palace:

> Repetition of tests to measure the degree of arterial obstruction has given the following information:
>
> In the left leg and foot the process of restoration of circulation has reached a stage which would be sufficient to permit some activity. In the right leg and foot re-establishment of circulation, while progressive, has been less rapid, and it is still of a degree which allows only strictly limited activity indoors. The nutrition of the right foot is satisfactory.
>
> With the passage of time and continuing care, further improvement in the circulation of both legs and both feet may be anticipated. We have advised His Majesty to remain in London for the time being, but hope that early in the New Year it will be possible for him to continue his convalescence in the country.
>
> The improvements in the King's *health, which we are* happy to record, are in no small measure the result of His Majesty's willing submission to certain irksome restrictions and of his complete coöperation in all measures of treatment.
>
> MAURICE CASSIDY
> THOMAS DUNHILL
> J. R. LEARMONTH
> J. PATERSON ROSS
> MORTON SMART
> JOHN WEIR.

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7. Perera, G. A. *Ibid*, 1945, **129**, 537.
8. Perera, G. A., Blood, D. W. *J. clin. Invest.* 1947, **26**, 1193.
9. Perera, G. A., Blood, D. W. *Ibid*, p. 1109.
10. Goldman, M. L., Schroeder, H. A. *Science*, 1948, **107**, 272.
11. Selye, F. L. *Canad. med. Ass. J.* 1947, **57**, 325.
12. Grollman, A., Harrison, T. R., Mason, M. F., Baxter, J., Crampton, J., Reichsman, F. *J. Amer. med. Ass.* 1945, **129**, 533.
13. Report prepared for King George's Jubilee Trust Fund, 166, Piccadilly, London, W.1. Pp. 143. 3s. 6d.
14. December, 1948–February, 1949, p. 101.

Special Articles

A TEACHING MUSEUM IN MINIATURE

SLICES MOUNTED IN PORTFOLIOS

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With the assistance of P. M. PETERS, B.M. OXFD, *and* L. M. FRANKS, M.B. DURH

IN the teaching of pathology no doubt the fresh, or wet preserved, specimen in the student's hands is the most informative, but this is not always readily available, and some form of mounted specimen becomes essential. The difficulty of getting specimen-jars and their prohibitive cost force one to seek alternative methods of mounting and first directed our attention to the value of sliced preparations. For large solid organs and tumours the method is ideal, and it is surprising how often very instructive preparations can be made from the most unlikely specimens. In solid tissues consecutive slices mounted in sequence in one frame (fig. 1) make visual reconstruction of a whole disease process quite easy. Hollow viscera mounted as such are usually unsuitable.

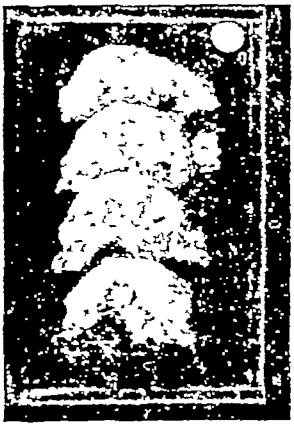

Fig. 1—Serial sections mounted in one folio to illustrate chronic mastitis and carcinoma.

The framed slices are fairly light and can be taken in the hand and examined with a lens. Optical problems are are reduced to a minimum, for the specimen is in a transparent solid medium and almost touching the 'Perspex' on both sides. The framed specimen forms one folio of a set which may include a tracing of the specimen on a transparent overlying sheet with explanatory notes, one or two photomicrographs in a coloured transparency, possibly a photograph or a drawing of the original tumour, a history of the case and the findings at necropsy or at operation, perhaps some remarks on the condition in general, and a list of references for further reading (fig. 2). The whole set of folios is in an opaque portfolio bound with ring clips and can be stored on the shelves like a book. There can be very little doubt that many of the large pallid monsters that we see floating on our museum shelves are suffering from an excess of exposure to light, and that a small part of them, properly mounted and with the colours adequately preserved, would give a far better picture of the pathological processes meant to be illustrated.

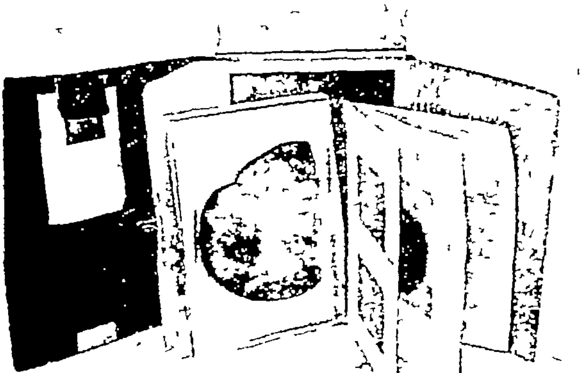

Fig. 2—Portfolio containing a slice of carcinomatous liver, 2 photomicrographs, a photograph of the uncut liver, a history of the case, a description of the specimen and its histological features, and a lantern slide.

There is no claim for originality in the mounting of a flat slice in a narrow cell, but one may emphasise the way in which a very large part of the material required to give an intimate knowledge of pathological processes can be presented in a very small compass.

PREPARATION OF THE SPECIMEN

This is similar to that followed in the preparation of museum specimens which are to be stored in kaiserling (K) 3, but it is necessary in the first place to cut a thick slice of the fresh specimen, avoiding distortion of the organ, at the site which is to be mounted. This should be laid on a piece of lint or thickish cloth on the bottom of the fixing tray, with another cloth and a sheet of glass laid over it in the fixative to avoid warping; the absolute minimum of pressure, however, must be used. Such a slice in solid tissue should be at least 10 mm. thicker than it is intended to mount, to allow for the final trimming down; in soft permeable tissue like lung 20 mm. is better.

The thickness of the mounted slice is a matter of choice, and very thin sections can be mounted effectively, as in the beautiful preparations of Gough.[1] We have found that, to give an appearance of solidity and verisimilitude, both as regards the capsule or periphery of the specimen and where hollow spaces or tubular structures figure in it, a final thickness of 6–8 mm. appears to be the most suitable. Slices showing much engorgement with blood must be washed before fixation, and this is perhaps best done in saline solution, to prevent lysis and staining of tissues.

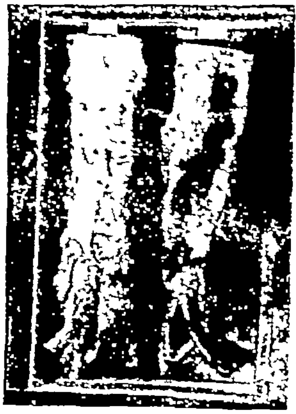

Fig. 3—Atheroma with ulceration and adherent clot.

Fixation and Shaping

This process has far too many problems to be discussed at length here. The object of the original slice is to enable the fixative to enter rapidly from both sides and to permeate the tissues throughout before they are altered by autolysis or decomposition. The pieces of cloth lying in contact with the tissue should be renewed after the first 24 hours; otherwise the coagulated exudate on them may form an impermeable layer. A parallel slice undergoing fixation at the same time can be cross cut every day or so to find out when fixation is complete and the slice is ready for paring down. Incomplete fixation is likely to be followed by oozing and discoloration of the mounting medium.

An alternative to the original slice, where large solid organs such as the liver are concerned, is to wash out the contained blood through the hepatic veins and then to inject KI under slight pressure, tie off, and immerse the organ in KI. The tissue will then become fixed throughout in a few days. The difference between such treatment and the mere putting of the organ into KI needs to be seen to be appreciated. In the latter case a thin fixed crust of about 5 or 6 mm. is formed overlying a central dark soft mass, and further penetration is both difficult and unlikely to produce a picture comparable to that on the surface.

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[1] Gough, J. *Occup. Med.* 1947, 4, 86.

The slice when fully fixed is now cut to the proper size. This is done on a board having adjustable rails of perspex or glass rod on it to hold the specimen and guide the knife, as figured by Anderson.[2] It is convenient to have two boards, one with the rails giving the correct thickness for mounting, and one with rails slightly thicker. A flat surface is cut on the fixed slice using the higher rails, and then by reversing the slice onto the other board and cutting away the other rough surface, the final thickness is obtained. A long, very sharp and rigid knife (a "ham knife") is suitable for this purpose, and the specimen should be cut as far as possible in one sweep from heel to tip of the knife. It is necessary to set the front guide rail close to the front edge of the board to give freedom to the hand and knife handle, the second rail being brought forward until it touches the back of the specimen. The shaped slice is now washed, recoloured in alcohol, washed again, and put into arsenious glycerin or K3 ready for mounting.

MOUNTING THE SPECIMEN

Preparation of the Frame.—We have simplified this by standardisation, and the required elements—two sheets of perspex 30 × 20 cm., and strips 1 cm. square—are purchased in bulk already cut to measure. The parts are stuck together with a fairly liberal streak of 'Diakon,' the four rails being first attached to one sheet, forming a shallow tray, which should be left to dry for an hour or so. After the specimen has been arranged and fixed to the tray, the other sheet of perspex is applied and attached in the same way. We arrange for a $^{3}/_{4}$-in. margin of each plate to be left free, one on either side, to permit handling and for binding into the portfolio. The top rail of the case has had already a narrow drill-hole bored at one end, and through this a large needle is inserted, and the cell, now stood up vertically, is filled by gravity from a suspended transfusion bottle containing melted Delepine's jelly.

Setting Up the Specimen.—The specimen requires support by one or two small studs or spikes of perspex which are stuck down on to the back sheet in such positions that they will support the specimen at the sides, or they can be actually pushed into or through it. This is necessary because the cell has to be filled in a vertical position so that all bubbles may be collected at the top and removed through the drill-hole. The hole is finally plugged with a small rod of perspex dipped in diakon.

In working out this method we have been greatly helped by our assistants Mr. H. Butcher and Mr. L. Pettit.

APPENDIX

Delepine's Glycerin Jelly Method.—Fix the specimen by any one of the dependable methods. Restore the colour in spirit. Place the specimen in arsenious glycerin until ready for mounting. Mount it in Delepine's jelly.

Delepine's Jelly.—Soak Coignet's gelatin 42·5 g. in water until soft. Squeeze out surplus water, and dissolve gelatin with 150 ml. of saturated solution of arsenious acid in a steamer for 20 min. When the gelatin has been dissolved, cool it and then add the whites of two eggs well whisked. Return the solution to the steamer until it becomes clear (30–45 min.). Filter, add the filtered gelatin to 443 ml. of hot glycerin. The careful addition of dilute gentian, or methyl violet reduces the yellow colour of the gelatin. This is best done with a drop-bottle against a background of artificial light to make the end-point more readily seen.

Arsenious Glycerin

Saturated arsenious acid	400 ml.
Glycerin	600 ml.

The solution of arsenious acid should be made in a fume chamber. Saturation point is about 1%.

The Act in Action

4. THE DENTAL SERVICES

At the beginning of this year the Dentists Register contained 15,160 names. Some of those registered are, however, not in general practice, and Mr. S. D. Cox, assistant secretary of the British Dental Association, puts their number at about 2600. By this reckoning England, Wales, and Scotland between them have some 12,500 dentists practising on their own; and of these just over 9800 have so far entered the new service.

The number of dentists, never too great, is now much too small. The total has fallen steadily during the last four years; and while the post-war intake to the dental schools will soon raise the rate of additions to the Register, this gain is likely still to be offset by deaths and retirals. Over 4500 are registered under the Acts of 1878 and 1921. Many of these are due to retire soon; and since they are outside the normal flow of gain and loss of those with registrable qualifications, their withdrawal will tend further to deplete the Register. In 1946 the Teviot Committee[1] reckoned that with an intake into the profession of just over 800 a year—which would mean an intake into the dental schools of nearly 900—it would take 20 years to achieve a total of 20,000 dentists. The dental schools, confined in much the same way as are the medical schools, are at the moment powerless to arrange for the training of such numbers.

PUBLIC DENTAL SERVICE

It was against this dark background that the new dental service started on July 5. Plainly some plan had to be followed to ensure that treatment was given to the most needy; and the profession agrees that special consideration should be granted to the expectant mother, the child, and the adolescent. Mr. A. H. Condry, secretary of the Incorporated Dental Society, put it this way: "Dental treatment is, in general, not curative: it is preventive and restorative. Thus it follows that treatment should be applied at the earliest possible age." This principle has been conceded; and yet ironically the public dental service, which exists to serve the priority groups of children and expectant mothers, is the branch which has come nearest to breaking.

In one area at least 30% of the dentists in the public service have resigned in order to enter private practice. Moreover, a further number have handed in resignations which are pending, and others have changed from whole-time to part-time employment; there are virtually no new entrants. The immediate reason for the threatened collapse of this service is the neglect to equate the salaries of the dentists employed to the terms of the Spens report; but the roots of the trouble go deeper. Twenty years ago a dentist starting in the public service was offered £450 a year. (Even now he sometimes receives only £650 a year, with the chance of increase up to £900, plus cost-of-living allowance.) The reward has never been sufficient to attract enough men and women to enter the service as their life's work; and authorities have had to rely largely on the assistance of those who spent a short time in it for the sake of experience. Thus even at July 5 there was insufficient staff.

The dangerous drift since then has been allowed to continue unchecked for two main reasons. First, not only the local authorities but two Ministries—Health and Education—contribute to the salaries, and none of these three parties seems eager to seize the initiative. Secondly, the local authorities are unwilling to promise an increase which can be honoured only by requiring rate-payers to dig deeper into their pockets; and they fear that any such increase would cause "imbalance" with the remuneration of other professional and technical personnel, who might then claim for themselves a similar increment.

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[2] Anderson, J. How to Stain the Nervous System. Edinburgh, 1929.

[1] Final Report of the Inter-Departmental Committee on Dentistry. Cmd, 6727. H.M. Stationery Office. 1946.

An emergency group of dental officers in the public service has lately been set up to get the position righted; and their demand for a Whitley council is likely soon to be met. The tardiness in establishing such a council is largely attributable to the conditions laid down by the other professional bodies, which insist that the council should be one of dentists only, and that the matters on which it cannot reach a final conclusion should be defined and limited, so that matters concerning dentists are not referred to a general council.

THE GENERAL PRACTITIONER

The cost of the dental services in the first nine months was originally estimated at just over £7 million. Now, it seems, the cost is running at the rate of about £28 million per annum.[2] Possibly with this in mind the Minister of Health has made it known that the dentist in private practice earning under the Act at a rate above £4800 gross will have the excess reduced by half in the new year.[3] The resulting protest from the professional associations derives less from disinclination to accept the cut than from indignation that they were not first consulted. Moreover, officials of the Public Dental Service Association point out that so far they have no evidence that more than two or three dozen dentists are earning amounts beyond those recommended in the Spens report. The proposed reduction does not, however, run counter to the Spens recommendations, which suggested a net income of £1600 for dentists working a 33-hour week at the chairside for 46 weeks in the year (with 6 weeks for holidays and illness); with the 20% betterment which has been conceded the net income is £1920. The justice of the report, whose terms have been accepted by the Minister, is acknowledged on every hand. Most dentists agree that 33 hours a week at the chairside (to which must be added some hours at other work) are enough. Here much depends on physique; and it has to be remembered that on average members of the profession are fairly old. Four years ago Mr. Cox established that the mean age of civilian practitioners was 52, and officers of the Public Dental Service Association set the present average at something over 45.

Hitherto, in an attempt to meet the demand, dentists have sometimes worked considerably more than 33 hours at the chairside—in some instances up to 75% more—and earnings have been correspondingly increased, a few gaining gross incomes at the rate of £12,000 or more a year. It has been agreed that expenses shall be reckoned at a general rate of 52% of gross income; but individual dentists point out that the percentage varies with the locality and the service provided, and with the size of the practice. In future there will be less attraction in these long hours; and there will also be less inducement to persuade people to receive free treatment. It is still too early to judge the proportion of patients benefiting by the service; but the experience of one man with a mixed practice may perhaps indicate the general trend. He says that whereas formerly he treated 10% of his patients under the National Insurance scheme, he now treats 10% as private patients. Nearly all patients in the professional classes have eagerly seized the chance to use the service; the 10% of private patients consists mostly of tradespeople, who prefer to pay rather than accept what they fear may be "utility" service.

The fees payable to the dentist under the Act range from £1 for a simple filling up to 30*s*. for a compound filling. If more than one filling is done at a single sitting the dentists may earn at almost—so to speak—double rate; but against this gain has to be set the difficult filling taking more than one consultation. Before the start of the scheme one of the greatest sources of income was the supply of dentures. Now a fee of 10 guineas is payable for supplying and fitting a complete set. In the hospital service the cost of a set is fixed at £4 10*s*.; and if this is taken as the average, the dentist's fee is £6. Normally four consultations precede the fitting; these take some dentists only about $1\frac{1}{4}$ hours, but most are occupied in this way for 3 hours, and to this must be added the time taken by subsequent adjustments. In complicated cases, or where the dentist aims at an exact reproduction of the previous dentition the profit is much less.

The determination of income by items of service has, perhaps above all else, accounted for the decision of some to remain outside the service. Many of these achieve an unusually high standard; and yet in the service they would gain no more than their less able colleagues. Their refusal also springs often from pride and a sturdy individualism, which prompts them to plan and carry out the treatment they think necessary without reference to an estimates board. They cast a thoughtful eye back on their Service days when they were esteemed officially not by the quality of their work or the severity of the conditions they chose to treat, but by the number of fillings they made per month (which had to reach a certain minimum). They reason that what holds for one public service must sooner or later apply to another, and they are persuaded that circumstances will not compel them to join the service, at least for many years to come.

Many who joined did so with grave misgivings; yet their way has been made unexpectedly easy. The Dental Estimates Board has proved so far very tolerant, allowing a degree of clinical freedom which dentists never expected. Authority has shown itself sympathetic in other directions. For example, dentists may now save time by using a facsimile stamp in place of a signature, provided that this is supported by initials; and arrangements are being made for limited emergency treatment to be carried out without the full charting of the dental state which is at present a first requirement.

The dental practitioner has his difficulties however; and foremost among these is that of supplies. X-ray films have become very scarce, and other materials and apparatus are almost equally hard to obtain. Suppliers complain bitterly of repeated refusals to permit importation of equipment. Before the war this was imported principally from the U.S.A. and Germany. Germany is again prepared to meet some of our needs; but licences are refused on the score that the granting of them might disturb the dollar balance. A similar ban is exercised on imports from France, which can offer a certain amount of equipment.

SPECIALISTS

The dentist has long been concerned that he is allotted less than his due status. This is largely rectified by the conditions under which he is now engaged in the Health Service; and the report on the specialist services, to be published shortly, is likely to augment this favourable trend by sustaining the parallelism with the medical profession first observed in the E.M.S. On the other hand, it is feared that the report may encourage part-time specialist work at the cost of whole-time work and to the detriment of the "temper" of hospital routine. The other outstanding difficulty in the specialist services is that of filling academic posts; this difficulty is, of course, shared by the medical schools.

DENTAL ASSISTANTS

Figures quoted by Mr. Condry show that some time ago at least 90% of the community were in need of dental treatment at any given moment, while only 10%

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[2] Leading article, *Brit. dent. J.* Nov. 19, p. 236.
[3] *Lancet*, Dec. 11, p. 938.

were receiving it; the remaining 80% went untreated. The full extent of the need indicated by these figures has not been disclosed by attendances on dentists in the first months of the service. Many dentists, booked up for three months or more ahead, already make special provision for seeing emergency cases at once, and expectant mothers and children with the least possible delay. More time might be found for these and for others by the further employment of chairside assistants. Such assistants, if competent, can often save 5–10 minutes in a half-hour consultation. In the public service almost every dentist has an assistant; but this does not yet apply to private practitioners.[4] Another possible method is dilution of the work through assistance from hygienists. The encouraging experience of the R.A.F. with hygienists has prompted some to hope that these may be employed in civilian work on such duties as scaling (though amendment of the Dentists Acts would first be necessary). The dental associations are opposed to such a course; and they oppose even more firmly the suggestion, from a few dentists, that technicians should be employed on the mechanical and technical aspects of clinical dentistry. A still smaller group of dentists favour this plan accompanied by revision and enlargement of the dentist's training with greater orientation towards medicine, so that each dentist would be an expert consultant. Either plan would call for the transfer of practice to clinics, to which the majority of the profession objects. The fear in many minds is that with clinics would come a whole-time salaried service. Nevertheless, clinics would bring to an end payment by items of service, which many find degrading; and they would also end the possibility of abuse. Two main abuses are now possible: one is to charge for a filling completed at a previous consultation, and the other is to charge for an X-ray picture that has not been taken.

The importance of the technician has been underlined by the great demand for dentures since July. The technician's position has been much improved of recent years through the efforts of the National Joint Council, set up with the cooperation of the dental profession, which now ensures that only indentured apprentices enter the craft. Whereas before the war technicians earned a precarious £3 or £3 10s. a week, they are now certain of a £6 10s. minimum, and with the ability supplement most get £10–15. This has had the important effect of attracting a better type of recruit. Mr. W. A. Warrington, representing the associated dental technicians section of the Union of Goldsmiths, Jewellers, and Kindred Trades, reports that of 10 apprentices lately placed by him 8 had matriculated.

Great Britain has some 7000 technicians, of whom about a third are self-employed; and the joint council has lately formed a "fair list" of accredited technicians in this field. Technicians wish to establish themselves as dental auxiliaries; and in fact the joint council has received a draft Bill calling for their registration. At the present time the supplementary training of apprentices is carried out by polytechnic schools; but arrangements for the further training of adult technicians are scanty, and there is now a strong moment towards setting up an Institute of Dental Technology for this purpose.

Technicians are too few for the new need; and their number will not increase rapidly because the joint council meanwhile restricts the intake of apprentices to the rate of 1 to every 3 qualified men. The Denture Service Association claims that it could help to fill the gap. This association speaks for the owners of about half of the 500 premises occupied with the repair of dentures by private contract with the public. These businesses employ, it is stated, a large number of technicians formerly apprenticed to dentists. The association says that, given participation in the service, its members are willing to have their employees submitted to a test of technical proficiency; they are also willing to stop advertising and to guarantee that, where need exists, people will be referred to dentists; but they are not prepared otherwise to abandon their independence. Like the three dental associations, the dental-technicians' unions are opposed to the inclusion of these premises in the scheme.

CONCLUSION

The general dental practitioner is free to accept or refuse patients as he wishes; and once a particular contract is completed he can treat as a private patient one who formerly attended under the Health Service. In general he is pleased with the operation of the Act in its first months; but he remembers that the British Dental Association has persistently advised its members not to enter the service. The three main objections of this and the other associations are: (1) that the profession should have a greater measure of clinical freedom; (2) that a system of grants-in-aid should be followed; and (3) that no full-time salaried service should be possible without an amending Act. The impairment of clinical freedom has hitherto been less than was forecast, largely owing to the leniency of the Dental Estimates Boards. The principle of the grant-in-aid, though still cherished by many, particularly as it could check abuse on either side, is unlikely to be conceded. There remains the doubt about a full-time salaried service. The selling value of practices has already fallen by 20% or more; and the question of compensation, should a full-time service be started, is unanswered.

Disabilities

19. ULCERATIVE COLITIS: COLOSTOMY

WHEN the question of my having a colostomy was raised years ago I used to say—and I nearly meant it—that I would rather be dead. In the five years since mine was done, as an urgent necessity, I have occasionally doubted whether life is worth living, but never because of the colostomy: financial difficulties, or the illnesses of my family, have weighed far heavier on my mind.

I fancy it comes to this. How much trouble a colostomy will give can be gauged from the state of your bowel beforehand. If you are normally of a constipated or regular-after-breakfast habit there is a good chance that your colostomy will be well-behaved and easily managed. If, on the other hand, you have been having 10 loose motions daily for years you must expect a stormier voyage; though, judging from my experience, anything will settle down in time.

* * *

I started ulcerative colitis suddenly in 1933, when I was 30 and had been 3 years in general practice. Those who look for an emotional background to these cases would, I think, have searched vainly in mine. True, I was not long married, with our first son on the way, and the junior "dogsbody" of a busy country practice. But I was happy, secure, conscious of moderate success in my work, well off (i.e., not losing more than my capital could correct), comfortable in a way that now seems fantastically opulent, and not grossly overworked —that came later. No; the cause was undoubtedly a mild dysentery which I shared with half the village; but, while the village cleared up in a day or two, I became chronic. There were two red-letter days after the acute attack when I was constipated (think of it): then I took a dose of salts, and judging by appearances it might well have been acting for the next ten years.

At first my loose inside was no great inconvenience. I tried the various astringents of the pharmacopœia, chalk (which worked a bit), and even iron. But I soon found that only opium could be relied on, and that in an amazingly small dose. For a year or two 5 minims of chlorodyne (tint. chlor. et morph. *B.P.* 1885) thrice daily was my maximum dosage (about gr. $^1/_{20}$ of morphine). Without it I could not leave home in safety; with it I could live normally with only a tiny anxiety. So I took it and went on with my work, with golf, tennis, dances—all the round which was middle-class country life before the war.

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[4] Lancet, Nov. 27, p. 875.

The trick, I found (and I commend it to others), was only to take the chlorodyne after my bowels had acted. You see the point? This is an insurance against overdosage and also against very embarrassing "accidents," because these super-disasters happened only when one's colon had become overdistended and a meal or a hot drink made it suddenly contract. Hence the waits, which drove my wife wild, for my bowels to act before I could take my medicine and join her at the pictures. Now and then, when only time was passing, I would risk it, with results which need not be described but (largely because my wife made fun of them) were more farcical than tragic. There was that time, for instance, when I left my pants and braces in a Hastings lavatory. . . .

This phase lasted three years, during which my "trouble" hardly varied: there were no exacerbations, remissions, or complications, until one day "the spots" started. These were petechiæ round my ankles, which in 24 hours developed into half-crown-size ecchymoses, accompanied by exquisitely tender swellings in one or more muscles (usually in a calf but sometimes in an arm), and in another 24 hours had faded. These "spots" recurred punctually every 16 days for about five months, each time rendering me hors-de-combat for one day. Scurvy? Yes, I think so, because in the end a bottle of ascorbic acid tablets finished them. But by then they had finished me, at any rate as a G.P.; because they forced me to "take proper advice," and that was to retire for a time.

For five months I lay in bed, charting my motions—only 10 today, 25 today, not so good—without any opium. Then I got out the chlorodyne again and retired to a Devon beach for a year.

* * *

The scene changes to 1942, with me doing an "evacuated" journalistic job, little inconvenienced by the looseness. Then gradually I began to develop an obstruction. That is, I no longer needed the opium, and in a month or two had to strain increasingly hard to get anything through. With this I had such bellyaches as I hope never to feel again. When even enemas failed I knew it was the surgeon's turn. He agreed—there was a rectosigmoid stricture—so I started 1943 with a colostomy on Jan. 1.

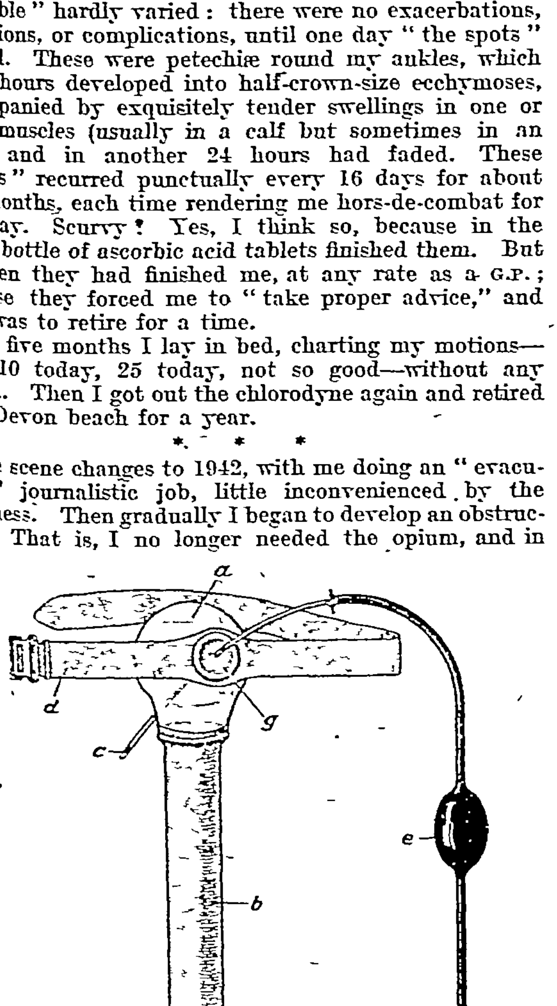

Fig. 1—Colostomy washout apparatus, consisting of plastic dome with two openings, a small one for inserting a catheter and a larger for the exit pipe. The whole is held on by a webbing belt. The maker is Donald Rose, of 36, George Street, Portman Square, W.1.

That was the worst year, because until near its end I could not control the colostomy. I tried washouts with a catheter and kidney-dish—twice; and each time spent an hour afterwards mopping the walls and ceiling. One might as well have held a bucket below a fire-hose nozzle to catch the jet. I tried increasing the opium, but it no longer took effect. So I wore a belt with a bag during the day and slept wrapped in cellulose wadding and rubber sheets. I still worked, in a secluded corner near the window.

In those bleak months my wife and I loathed Charles, as we called the colostomy; but we loathed it impersonally, not as part of me. The illusion of an isolated existence is easily maintained, because the extruded bowel besides having, it seemed, no decent feelings also has no feeling, except for its own contractions. Then, miraculously, almost in the twinkling of an eye, all was well. In October, 1943, I was operated on for pyloric stenosis (that is another story). After this a friend told me of the washout cup (fig. 1) which I have used ever since, and in a week I could exchange my bag for the simple belt and St. Mark's shield illustrated in fig. 2, and "accidents" became a rarity. Now my day is as follows:

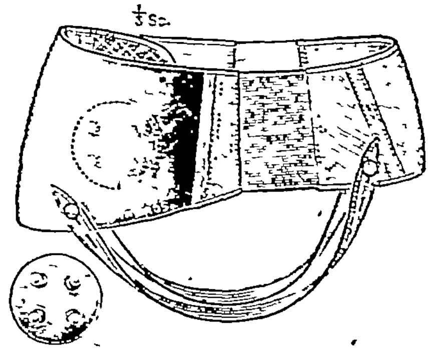

Fig. 2—Simple calico colostomy belt with rubber or plastic insertion and St. Mark's shield. I now prefer an even simpler, narrower all-rubber belt which is free of clothing coupons. The belts are made by Messrs. Down Bros.

> Get up at 6.30, change into a sweater and stockings, put on my washout cup, and retire to the lavatory with a $1^1/_2$-gallon can of warm water, a chair, a quart jug, some cellulose wadding, and a *book*. (That is the great joy: it isn't even a wasted half hour, for one can read.) With the jug on the chair, and the book propped behind it, I slowly pump in the water, 1–2 pints at a time, letting and if need be encouraging it to squirt out again between injections. One soon learns to know when no more need be done, and at that stage I pummel and prod myself to ensure that all the water is out. This is an important step for the rest of the day's comfort. Then I clip the end of the exit pipe with a large paper-clip, and come out to shave. If any water is left in it usually appears during this process. If one is doubtful, a few toe-touching exercises will help. It only remains to remove and wash up the cup, have a bath, cover the colostomy with a good pad of wool, and apply the belt. One should be ready for breakfast at 8 and have no further trouble all day. At night I renew the dressing and wear a linen binder instead of the belt.

What can I do with a well-controlled colostomy? Anything I could do without it. Even staying at a hotel, provided it has a bathroom and w.c. combined, presents no difficulties. Through one's clothes the belt is quite unnoticeable, and there is no smell whatever. *Before July 5 dressings* were expensive, for I use about $1^1/_2$ lb. of cotton-wool and $^1/_2$ lb. of cellulose wadding weekly; but now even that little burden has been lifted.

In England Now

A Running Commentary by Peripatetic Correspondents

THE problem of presents is here again in an acute form. For the very young and very old it is fairly easy; they are pleased with most gifts. What matters is the receiving of a present: what happens to it afterwards is often unimportant. An old gentleman I knew had all the ties and socks and handkerchiefs he wanted and he re-read his old books. So his wife just bought a box of linen handkerchiefs for his Chistmas present and then stored them away for presentation again next year. He was always delighted at being remembered and never suspected the wiles of his wife. It used to be, and perhaps still is, the custom to take a present when visiting a newborn baby. I know of one pair of knitted bootees which went from family to family on a new housing estate and were eventually presented to the original donor when her second child was born.

* * *

To me, as a doctor's wife, the greatest disaster of the new service is the unfortunate instruction to patients on the new cards: go to the surgery whenever you can and ring early if you cannot. They do indeed try to ring early; they queue for the line, and they tend to avoid having to do this by ringing earlier and earlier. The result is that I am usually not dressed by nine o'clock, let alone having time to wash or have breakfast; even when the "staff" are not down with chickenpox, the early morning is the time when I am single-handed and least able to run a telephone exchange. The instructions imply that someone will be available to deal with calls, and the patients, oddly enough, take it for granted that this is so since July 5.

More crippling still is the notion that surgeries are now chronically overcrowded and that all minor troubles had therefore best be handled by telephone. All these people demand to speak to the doctor personally, and many of them feel that they are doing him a kindness by ringing up and so saving him a proper consultation (and themselves a long wait). The really considerate want to save him visits too by trying to explain their troubles at length and getting advice by telephone, and I am quite helpless against them. I have not the time to explain (nor have they the inclination to hear) that they would in fact force him to spend half an hour doing a five-minute job badly if I did fetch him to the telephone; and that surgery would be a farce if the telephone were allowed to interrupt every consultation. Nor, though qualified, can I pass myself off as the doctor and advise on the spot, since my domestic emergency surpasses anything these people have any experience of. The best I can do is to bully them into parting with their name and address, put the receiver down before they can say any more, hope they will think we have been cut off, and have them visited that day. It's a horrible job and puts me in the wrong all round. Only the fact that there are no more bills to send makes life bearable; but the patients naturally think that I have become abrupt and unfriendly because I am now "part of the service!"

I have seen it mentioned that doctors' households enjoy a measure of priority in the matter of domestic staffing; and this is just sufficiently true to give one a nice, though false, feeling of security; it breaks down when it comes to securing the actual domestic. The way it works is that the local labour exchange, having satisfied themselves of one's need and genuine claim to priority, undertake to send along for interview any domestic who happens to come into the open market, and to "direct" her to work there in any domestic capacity required (regardless of the fact that none of them can cook and hardly any are safe with children). If domestics ever got into the open market for good reasons, the arrangement would no doubt work admirably; in my experience the reasons, though highly varied, are never good. I have interviewed tuberculous girls, pregnant girls, dwarfs, and epileptics; and I finally engaged an Irish girl whose real desire was to serve behind a bar, but who could be directed into domesticity. A bull in a china shop is the first analogy that comes to my mind, the only "china" to survive at all being the children. The same sort of thing, with variations, happened with her successor of the uncontrollable temper, and since then I have merely longed for the bliss of peace and no more interviews. I should be interested to know how many doctors' wives have benefited from their claim to domestic priority.

* * *

The hospital was large, modern, and well-appointed, but the lift had stuck midway between the sixth and seventh floors. The five men had pressed the buttons and rattled the gates for some time in vain.

"Where did you want to go, Sir Charles?" asked the tall one who looked like a matinée idol. The famous cardiologist shrugged wearily. "Some case Pulse-Palpable asked me to see for him in Fourteen; sounds like a heart-block after a coronary thrombosis, but he can't make out the E.C.G. And you?" he concluded politely. "Oh, I'm going the same way, sir, to see a query aphasia or dementia. May have to call you in, Alec." He glanced indolently at a bespectacled man with a dome-shaped forehead. "Well, if you want me," said the psychiatrist, "I've got a chap to see that sounds like an Alzheimer in Fourteen, so I can kill two birds." The fourth man had been pacing from side to side and peering into the lift-shaft. "What a confounded waste of time this is!" he burst out. "Got to be at Moorfields by four. I only came up to look at some fellow's discs too."

The ruddy-faced elderly man in the raglan murmured sympathetically, "I'm rather busy myself—I'm a G.P." The others smiled politely, and he went on, twisting an old felt hat in his big hands, "One of my patients is in here, pretty ill, poor chap, and I promised his missus I'd look in and see him. Used to be a hefty fellow, too; played for years in our local soccer team. He was a jolly good goalkeeper, old Jack. Robinson his other name is; perhaps some of you gentlemen know him?" They shook their heads. The lift gave a jerk. As it started slowly to ascend, the four consultants glanced hastily at the "Request for Opinion" cards in their hands. All four cards read: *Robinson, J. Male. C. of E.* 25,392. *Wd.* 14.

* * *

The district officer rang up to say that a Dyak had just dropped dead in the bazaar, a few yards from his office window. He added that the victim had terrible convulsions before dying and was clutching a bottle of our hospital medicine in either hand. Thinking to myself that the usual heavy outpatient attendances would probably be lessened for the next few weeks, for news travels fast here, I agreed to perform the suggested necropsy on the following day.

When I was doing a ward round next morning, proceedings were interrupted by the entrance of the Chinese chief clerk, looking extremely perturbed. He announced that about twenty Dyaks, each with his parang,[*] were picketing the mortuary, did not intend to allow a postmortem, and would like blood money into the bargain as the hospital had supplied poison in place of medicine. The district officer was summoned, and after a parley with the Dyaks we went to inspect the exhibits. The bottle of cough medicine was untouched, but two ounces of lin. methyl salicyl. was missing from the other bottle. The superficial appearance of the corpse suggested asphyxia. Both the dispenser and the dresser concerned had taken pains to ensure that the deceased knew which bottle was which, and he had himself requested a supply of liniment as an afterthought to receiving the other medicine for his sore throat. Honour was satisfied by the issue of a certificate saying "Cause of death unknown. Foul play not suspected." We felt that the loss to forensic science of the necropsy was offset by the fact that, locally, one head is better than none.

* * *

"You know, dear," said one of the patients in the doctor's waiting-room to her friend, "the X rays you get on this new service are no good. They don't use the same voltage or something as they do for private X rays."

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[*] Midway between a billhook and a meat chopper.

Letters to the Editor

PENICILLIN THERAPY OF MIXED SKIN INFECTIONS

SIR,—Although the application of penicillin cream to surface lesions infected with streptococci (Lancefield's group A, C, or G) usually eliminates this organism rapidly, occasional failures occur. For example, Colebrook[1] has noted failure in the penicillin treatment of burns infected with streptococci and *Staphylococcus aureus*. It has been suggested that a possible cause of such failures may be an associated infection with penicillinase-producing organisms.[2] We wish to present direct evidence that in a mixed infection with penicillinase-producing *Staph. aureus* and streptococci, the latter organisms, although sensitive, are rarely eliminated by local penicillin therapy. Emphasis is laid on *Staph. aureus* because it is so very commonly present in large numbers in streptococcal lesions.

The evidence is derived from the bacteriological sampling of skin lesions infected with both streptococci and *Staph. aureus*. The lesions were: (1) chronic vesicular eczema (10 cases); (2) skin-sensitivity reaction (7 cases); (3) leg ulceration, varicose or traumatic (6 cases); and (4) miscellaneous—infective dermatitis, seborrhœa, &c. (10 cases). Although streptococci were not primarily responsible for the condition their presence was usually manifested by undesirable clinical effects—exudation, crusting, or œdema. The lesions were treated by the daily application of penicillin cream or jelly (400 units per c.cm.), and swabs were taken at various intervals during therapy. Cultures were made aerobically on penicillinase-blood-agar plates, anaerobically in penicillinase-nutrient broth, and also in most instances on gentian-violet media. The criterion of penicillinase production was the ability of a 24-hour broth-culture to inactivate 30 units per ml. of penicillin during 3 hours' incubation at 37°C.

The bacteriological results are shown below, the data being based on all swabs taken between the 8th and 21st day of penicillin therapy.

	Penicillinase-producing Staph. aureus	
	Absent	*Present*
Elimination of streptococci—		
"Successes"	8	1
"Partial successes" ..	7	4
"Failures"	3	10
Total patients	18	15

The patients have been divided into two groups according to whether or not penicillinase-producing *Staph. aureus* was isolated from the skin lesion at any time during treatment. Each of these groups has been subdivided into three categories. The "successes" are those patients whose lesions never yielded streptococci after the week's treatment; the "failures" are those whose lesions yielded, on at least one occasion, more than 30 colonies of streptococci; and the "partial successes" are an intermediate group in which, after treatment, streptococci were isolated in very small numbers, often being detected only by the broth-subculture technique. Inspection of these results shows that much greater bacteriological success was obtained in the absence of penicillinase-producing *Staph. aureus* than when this organism was present. Statistical analysis shows a significant association between the isolation of penicillinase-producing *Staph. aureus* and the persistence of streptococci in the lesions. This association is highly significant both when the results in the intermediate groups are regarded as "failures" (by factorials $P = 0{\cdot}018$) and when they are regarded as "successes". ($X^2 = 6{\cdot}6$; $P<0{\cdot}02$).

Although the figures quoted prove merely an association, the simplest explanation of the finding is that penicillinase from the staphylococci is destroying the locally applied penicillin.

The failure to eliminate streptococci was generally associated with clinical failure of penicillin therapy. The correlation between the presence of penicillinase-producing *Staph. aureus* and clinical failure was, however, less striking. This is only to be expected, as the streptococci were usually secondary invaders and variations in the underlying condition might well obscure the picture. There is sufficient clinical evidence, however, to support an opinion that local penicillin therapy of skin lesions with a mixed infection of streptococci and penicillinase-producing *Staph. aureus* is likely to fail in about two-thirds of the cases. Although the application of more concentrated penicillin preparations might secure the removal of streptococci in a few cases, a satisfactory method of dealing with such a mixed infection is the local application of another chemotherapeutic agent such as dibromopropamidine.[3]

M.R.C. Industrial Medicine and Burns Research Units, Birmingham Accident Hospital.

C. N. D. CRUICKSHANK
J. R. SQUIRE
ELIZABETH TOPLEY.

THE GENERAL PRACTITIONER

SIR,—I was interested to note the discrepancy between your finding that the public welcome the National Health Service, and Dr. Weston's impression that they do not. My own experience is that the discrepancy is apparent rather than real; patients will vote for or against the service according to their grasp of its true intentions. It has not been easy for them to get such a grasp, and now that most of them have their medical cards, and have assimilated the printed instructions, it has become impossible.

The idea of getting something for nothing is sufficiently startling for people to wonder what might be behind it. I spent most of June and July explaining that what is behind a free health service is the general recognition that health should be the birthright of everyone; that the nation no less than the individual would benefit if attention to health were made independent of finance and other irrelevancies.

The response to this gospel was an evident desire to take my word for it, tempered by the suspicion that there must be a snag somewhere, if only one knew where to look for it. I averred categorically that there was no snag, at least from the patients' point of view, and that any rumours to the contrary should be ignored. Then came the cards to give the lie to my preaching, to confirm the patients' worst suspicions, and to sow distrust where confidence had begun to grow. Back came the patients—some dismayed, some aggressive, all disappointed—to show me page 2: "There, doctor, what did I tell you? I would rather go on paying you, if you don't mind, than have the wife come to the surgery every time she gets one of her headaches. She has no-one to look after the children, and we should not like you to feel that you've been called out for nothing."

This covers Dr. Weston's experience, I think, but it does not show what the patients think of the new service: it shows what a fatal blunder it was ever to allow the service to become associated with restrictive rules which no-one could fail to dislike. In so far as these have come to be identified with the concept of caring for health on a national scale, the vitality of the service has been destroyed, and it is hard to imagine a counter-measure which might restore it.

However lenient a view one may take of the injunctions on the new medical cards, their effect has been wholly deplorable. The attempt at regimentation is a complete break with tradition in medical practice, and is as unpopular in theory as it is undesirable at the present stage of administrative imperfection; it is a denial of the confidence which now, more than ever, should have been the basis of the doctor-patient relationship; since the patients' loyalty and friendly coöperativeness was the only real insurance doctors had against abuses of the service. Where once a message to the doctor seemed all that was needful, the patient must now make it his first concern to cater for the supposed convenience of his doctor. To this end he has been constituted judge of fitness or otherwise for a journey to the surgery and any exposure it may entail, and he is asked to act on this judgment. Worse still, he is virtually directed to make use of facilities provided by health centres which have yet to be built. It is hardly surprising that he feels he is paying pretty dearly for the freedom from financial obligation, and that he is ready to blame the scheme and all its works for his discomfiture.

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[1] Colebrook, L. (personal communication).
[2] Fleming, A. Penicillin. London, 1946; p. 53.
[3] Wien, R., Harrison, J., Freeman, W. A. *Brit. J. Pharmacol.* 1948, 3, 211. Bull, J. P., Ross, W. P. D., Topley, E., Squire, J. R. *Lancet*, Nov. 6, p. 747.

No-one expected to escape difficulties and hardships while the new health service was being helped to its feet; it was generally recognised that so vast a piece of social legislation could never hope to find an administrative machine geared for the job in advance; but there were enough people who welcomed the scheme on any terms, and who were eager to make good the initial defects by exerting themselves in any way or degree that seemed to be called for. These willing horses included Dr. Weston's housekeeper and her opposite numbers in other medical households; they worked gamely enough in the past and they would be game still, had not the administration planted the proverbial cart so firmly before the horse by "affording" the facilities without the centres. It is not possible to will an adequate telephone service into being while one is obliged to do something else, nor is it possible to derive any satisfaction from the heroic failure to adapt a small and understaffed private house for the smooth running of large outpatient sessions —particularly when the "outpatients" attend under duress.

It seems that the authors of "General Information" succeeded in paralysing the good will of nearly everyone whose devoted services were essential to the success of the National Health Service. Everyone, that is, except the doctor who is sufficiently emancipated to dismiss a gathering of gloomy patients with the genial assurance that they will all be visited at leisure, if they will be good enough to leave their names and addresses with him. The sigh of mass relief with which tortured humanity greets this announcement more than repays his "unnecessary" trouble; it also suggests that the authors aforementioned might do well to consider what, by contrast, deserves to be called "necessary" trouble.

PRACTITIONER.

WELFARE OF THE HOUSEWIFE

SIR,—Dr. Instone in her article on the housewife (Dec. 4) has put on paper what has long been well known over the teacups by women of all income-groups. No doubt the subjective nature of some of the observations is open to criticism, but the general picture is unfortunately true. May I make a plea for a similar survey of a comparable sample of men? With so much talk of shorter working hours, improved industrial environments, and so on, it is often forgotten that men in all strata of society now do many hours of homework after (and before) their recognised day's work. Many household chores which used to be regarded as the perquisite of the gentler sex are now thrust upon broader shoulders, and bathing the baby is no longer a woman's privilege. I have an impression that the percentage of anxious strained faces among househusbands would be as high as Dr. Instone found among her housewives.

London, E.C.3. ALAN WATSON.

AGRANULOCYTOSIS

SIR,—Some time ago we published the case-records of two patients with agranulocytosis who had a return of granulocytes to the circulating blood within 48 hours of starting folic-acid therapy.[1] In your issue of Dec. 4 Dr. Waelsch described two similar cases together with three others in which spontaneous remission took place. Since the occurrence of such spontaneous remission in this disease is not in dispute, the value of Dr. Waelsch's paper would seem to us to lie mainly in the addition of two further examples of a happening which, as we said in our article, may be merely a coincidence. We do not follow the argument which leads him to conclude that "closer study suggested that this improvement was a spontaneous remission." There is no law of nature which requires that therapeutically induced remissions should be distinguishable from natural remissions by their characters.

Agranulocytosis is a symptom which may arise as the end-result of different pathological processes. If it be wrong to compare drug agranulocytosis with the agranulocytosis of nutritional deficiency, then surely it is equally naïve to draw conclusions on the therapy of drug agranulocytosis from what happened in a patient with pernicious anæmia. At present what we would claim for folic acid in agranulocytosis is that there is as much indication for giving it as for giving pyridoxine, and rather more than for giving the highly toxic pentose nucleotides.

Department of Medicine, University of Manchester. D. A. K. BLACK
S. W. STANBURY.

ILLUSIONS WHILE FALLING ASLEEP

SIR,—I wonder whether any reader has come across and successfully treated the following minor complaint.

Within the last few months a number of patients have mentioned a curious sensation in the head and limbs just before falling asleep at night. They feel as though they are swelling to twice their usual size, and only by touching the parts concerned can the unfortunate victims reassure themselves that these have not reached elephantine proportions. Though distinctly unpleasant and lasting up to about 15 minutes, these attacks do not seem to be of sufficient importance to warrant a visit to a doctor, for they have only been mentioned to me in casual conversation. In each case the patient has been above the average in intelligence. All emphasise the acute unpleasantness of the attacks.

Exmouth. ARMOREL NETTELL.

PENILE CARCINOMA AND CIRCUMCISION

SIR,—Sir Ernest Kennaway has called my attention to a mis-statement in my lecture given to the Eighth International French Biochemical Congress, and published in your issue of Nov. 27. I stated that "in Moslems, who are circumcised in early boyhood and never as babies, the incidence of carcinoma of the penis is the same as in the uncircumcised non-Jews." What Sir Ernest Kennaway said was: "Cancer of the penis does not occur after circumcision on the eighth day according to the Jewish practice, but occurs in later life in Moslem populations, where the operation is carried out between the 3rd and 14th years." As Sir Ernest points out, there are no statistics available on the frequency with which this occurs. This, however, does not affect the argument developed in my lecture.

E. C. DODDS.

SIR,—Professor Dodds, in his excellent critical survey of Nov. 27, discusses the common theory of long-term action of carcinogenic factors. Some of the evidence given by him appears, however, to be open to question. Referring to a study by Kennaway,[1] he says that Jews, who are circumcised soon after birth, never develop carcinoma of the penis, in striking contrast to Moslems, who are circumcised in early boyhood. He adds:

> "This suggests that the carcinogenic potentiality is conferred on the epithelium of the penis during the first few years, and that the carcinoma which develops forty or fifty years later had its foundation when the child was uncircumcised."

And Kennaway points out:

> "The failure of the operation deferred until the 14th year to give the protection given by it when carried out on the 8th day suggests that the trail of the cause does not then avert the development of cancer at a much later age."

I do not think the evidence for such an argument is conclusive. There seems to be no sure proof that in the uncircumcised adult with penile carcinoma malignant change really began in the first years of life.

Certain industrial forms of cancer seem to arise after long "incubation" periods; but it seems impossible that the surgical removal, in early infancy, of the prepuce —a protective structure—should prevent the later development of carcinoma on the glans, the retroglandar sulcus, or the skin of the shaft. On the contrary, I suggest that the removal of the prepuce may expose the penis to all manner of carcinogenic "irritation." It might be argued that the preputial mucus is carcinogenic; but then why is vaginal carcinoma so rare in women, despite the vaginal mucus and the preputial mucus transferred during intercourse?

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[1] Lancet, 1947, 1, 827.

[1] Kennaway, E. L. *Brit. J. Cancer*, 1947, 1, 335.

My main objection, however, is different. How does Kennaway explain the astonishing fact that Jewish women hardly ever develop carcinoma of the cervix—a form of cancer dreadfully prevalent in other peoples? (In negroes carcinoma of the cervix is more frequent even than carcinoma of the breast—at the Hospital for Negroes in St. Louis five times more frequent.) Only one explanation remains—racial differences in susceptibility to cancer of the various tissues. In animal experimentation such a difference is recognised as existing even between different strains of the same species; and in man this difference is particularly evident in respect of penile cancer. Ngai[2] has reported that in Mongols cancer of the penis accounts for 18¾% of all cases of carcinoma, whereas in Britain it accounts for only 1½%. Thus I conclude that the determining factor is not circumcision but specific racial susceptibility.

London, N.W.3. **HANS BAB.**

HUMAN TOXOPLASMOSIS

SIR,—Dr. Jacoby and Dr. Sagorin end their excellent report last week with the sentence: "Unfortunately there are in England at present no facilities for performing the antibody neutralising test, and in our opinion the provisions of such facilities is essential." This is perhaps putting it rather strongly. In this laboratory we have been working with the neutralisation test; and other laboratories are probably doing likewise. This test is not simple to interpret. We should therefore like to increase our experience and would be grateful if physicians who suspect toxoplasmosis would get in touch with us.

Bacteriology Department,
The University, Sheffield.

C. P. BEATTIE.

HOSPITAL BIOCHEMISTS

SIR,—Your correspondent "PH.D." (Dec. 4) is labouring under a serious misapprehension. He can rest assured that at a salary of £1500 per annum a hospital biochemist with medical qualifications would be expected also to be chemically qualified.

A medical graduate with experience in biochemistry can act as a medical consultant in matters where biochemistry is concerned. The additional salary he commands is, therefore, recognition of his additional usefulness. A chemist with limited medical knowledge is in many ways worse than one with none at all. He cannot hope to be more than a high-grade technician as far as his medical colleagues are concerned. There is to my knowledge one notable exception to this rule, and his ability has been recognised by his appointment to one of our more important university chairs of chemical pathology. The remarkable rarity of such an exception can be appreciated only by those who are themselves medically qualified. I have yet to meet the university graduate in chemistry who is better technically than the fully trained laboratory technician holding the F.I.M.L.T. or A.I.M.L.T. in biochemistry. Nevertheless, a salary for a science graduate of £750–1000 per annum is far in excess of that paid to the senior technician.

I have no personal axe to grind. In addition to a chemical qualification I hold higher degrees in both biochemistry and medicine.

CLINICAL BIOCHEMIST.

ACUTE ATROPINE POISONING

SIR,—After my experiences with the cases of atropine poisoning reported by Dr. Buxton and myself in your columns on Aug. 7, I was very interested in the reactions of my own small daughter to the instillation of atropine eye-drops.

She is just 4 years old, and had to have her eyes atropinised recently before examination for a suspected error of refraction. She had two drops of 1% atropine sulphate instilled into each eye three times a day for 5 days. On the 1st day she had difficulty with near vision, but appeared to get over this. On the 3rd day she had bright red patches on her cheeks and her mouth became dry; she had difficulty in swallowing dry food. By the 4th night she was becoming very restless and easily tired, and called out once or twice in her sleep. On the 5th night she slept very little and talked almost continuously, occasionally crying out and shouting. Her speech was rational and, for the most part, calm, but she changed from one subject to another as though talking in a dream. She repeated nursery rhymes which she had not heard for a year or more. Whenever I went to her she was ready to jump out of bed and play, as if it were the middle of the day, and talked excitedly. She did not want comforting as she does when she calls out when she is poorly. As morning approached she fell asleep and did not awake until 11.30 A.M. She was puzzled at waking up so late and did not remember anything that had happened during the night. Apart from the dilatation of her pupils she appeared to be normal.

It would be interesting to know how common this type of reaction to atropine eye-drops is in children. Those of my colleagues with whom I have discussed the question are certainly unfamiliar with it, but perhaps the ophthalmologists see it more frequently.

Woolton, Liverpool. **RICHARD B. WELBOURN.**

Parliament

QUESTION TIME

Nutritional Standard

Sir WALDRON SMITHERS asked the Minister of Food why his department informed the United Emergency Fund for Britain that Britain was living on marginal constitutional standards and expressed anxiety for the physique and health of our people; and what steps he was taking to remedy the situation described.—Mr. JOHN STRACHEY replied: In August we were asked by the U.E.F.B. to give as accurate an account as we could of the state of the national nutrition. We replied, as we have repeatedly said before and since, that our present diet, though nutritionally adequate, left little margin and that we were making every effort to supplement it within the limits of our financial strength. This in part we have succeeded in doing as the recent increases in the distribution of sugar and fats bear witness.

Mr. SIDNEY SHEPHARD asked the Minister what was the calorific value of rationed and points foods at the most recent date; and what were the comparative figures for the years 1944, 1945, 1946 and 1947, respectively.—Dr. EDITH SUMMERSKILL replied: The calorific value of the foods at present on domestic rations plus the allowances of milk and eggs to a normal adult at the present time is approximately 740 calories a day. The figures for the same foods for December 1944, 1945, 1946, and 1947, are 730, 710, 720, 620, respectively. In December, 1946, bread was rationed and in December, 1947, both bread and potatoes were rationed. Both these and also preserves have now been taken off the ration. The average quantity of points foods available has provided 150 and 200 calories daily during these years.

National Health Service in Scotland

Mr. JAMES CARMICHAEL asked the Secretary of State for Scotland if he would submit a report on the work of the National Health Service in Scotland, including some detailed evidence of the earnings of doctors, dentists, and opticians; and the difference in the cost of denture treatment and of articificial dentures and glasses compared with costs for similar services prior to the commencement of the National Health Service.—Mr. ARTHUR WOODBURN replied: A report on the health service will be included in the next annual report of the Department of Health for Scotland. Mr. CARMICHAEL: Is not the Minister aware of the serious increase in charges to the State and the necessity for an immediate examination? A medical officer in Scotland has already indicated that in his area dentists are now earning on an average £15,000 per annum. Glasgow corporation received a report to the effect that while formerly they paid 8s. 4d. for schoolchildren's glasses they are now paying £2 10s. Surely, that calls for immediate action. Mr. WOODBURN: A great many stories go about, and there are facts accumulating which perhaps are a little unsettling, but these matters are receiving the careful attention of the responsible committee. In due course they will be examined, and action taken, if necessary.

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2. Ngai, S. K. *Amer. J. Cancer*, 1933, 19, 259.

Mr. J. Henderson Stewart: As the report of the department is not likely to be presented to the House for many months, and as the matter is urgent—for example, some doctors in my district have suffered such serious cuts in their incomes that they cannot meet their responsibilities—is there not a case for a special interim report?—Mr. Woodburn: I met the representatives of the doctors on Friday, and it is rather curious that they did not mention this matter. I should have thought that they would have been the first people to have brought it to our attention if it had been necessary to do so.

Mr. Carmichael: If the Minister has evidence prior to the submission of this report, has he sufficient authority to alter the conditions regarding opticians and dentists?—Mr. Woodburn: Action has already been taken with regard to one set of factors mentioned, and of course administrative action will be taken where necessary.

Discontent among Public Dental Officers

Mr. Carmichael asked the Secretary of State for Scotland what reports he had received regarding the local authorities' clinical services with particular reference to the dental service and the discontentment at the staff remuneration in contrast to the incomes being earned by those engaged on similar work under the National Health Service and what action he intended to take to ensure that all local authorities' health services were maintained in the highest level with well qualified and contented staffs.—Mr. Woodburn replied: I am aware that some authorities are having difficulty in maintaining their dental services at full strength because of a drift of public dental officers to general dental practice. I am encouraging the local authorities who are the employers of public dental officers and the dental associations to enter into negotiations about salaries. In the meantime I should like to pay tribute to those dentists who are continuing to carry on their important work in the public service.

Infant Mortality in Scotland

Replying to a question Mr. Woodburn gave the following figures comparing infant mortality in Scotland and in England and Wales.

Infant-mortality rate (deaths of infants under 12 months per 1000 live births)

Year	*Scotland*	*England and Wales*
1947	56	41
1948—		
1st quarter	51	41
2nd quarter	43	31
3rd quarter	40*	28

*Provisional.

Exchequer Grants to Medical Schools

Mr. Somerville Hastings asked the Chancellor of the Exchequer what proportion of the cost of medical education in England and Wales was paid by taxation.—Sir Stafford Cripps replied: These figures are only available for London as in that case the medical schools receive separate allocations of grants. In 1946–47, the latest year for which figures are available, approximately 55% of their cost was met by Exchequer grants. This figure takes no account of financial assistance given from the Exchequer to individual medical students.

Artificial Insemination

Mr. T. E. N. Driberg asked the Prime Minister if he would consider the appointment of a Royal Commission to examine the social and legal implications of the practice of human artificial insemination, including A.I.D., with special reference to the problems of legitimacy and inheritance involved; or extend the terms of reference of the Royal Commission on Population to include this subject.—Mr. C. R. Attlee replied: I should prefer first to see the general report of the Royal Commission on Population which I understand is in the final stages of drafting.

Mr. Sydney Silverman: Is the Prime Minister aware that in an answer given on behalf of the Attorney-General on these matters it was said that the question of an inquiry into the legal implications of this decision was being considered? Does the present answer mean that it is not being considered until after the Royal Commission on Population has reported?—Mr. Attlee: I said in regard to the setting up of any Royal Commission that I should prefer to see the general report of the Royal Commission on Population first.

Artificial Limbs

Lord Willoughby de Eresby asked the Minister of Pensions how many private firms were manufacturing artificial limbs in July last; how many had now entered into contract to supply artificial limbs under the National Insurance Act; and how many persons insured under the National Insurance scheme had chosen to be fitted with an artificial limb or limbs from any of these now contracting firms.—Mr. Arthur Blenkinsop replied: In July last there were 19 private firms manufacturing artificial legs in addition to the main contractor to the Ministry. Of these 13 have now entered into contract with my department to supply patients under the National Health Service Act and negotiations are proceeding with 3 others. Up to Nov. 19, 597 National Health Service patients have chosen to be fitted with artificial limbs made by one or other of 11 of these firms. The contracts with the remaining 2 firms were only recently concluded.

Rheumatism Research

Replying to a question Mr. Aneurin Bevan stated that research in rheumatism was being carried out at the following centres:

Acute Rheumatism.—Canadian Red Cross Memorial Hospital, Taplow (clinical and laboratory investigation of rheumatic fever); Sheffield, Bristol, and parts of Lincolnshire (social investigation of notified cases of acute rheumatism in children); University College Hospital, London (experimental study of changes in the blood and tissues in rheumatic fever).

Chronic Rheumatism (Arthritis, &c.).—Manchester University (clinical and laboratory investigation of chronic arthritic disorders, and of rheumatic disease in miners); Leeds University (clinical and laboratory investigation of chronic rheumatic diseases); Royal Free Hospital, London (clinical and laboratory investigation of chronic rheumatic diseases); Hospitals in London, Bristol, Leeds, and elsewhere (special statistical inquiry into the clinical and social aspects of rheumatoid arthritis); Maclean Laboratory, Hospital of St. John and St. Elizabeth, London (investigation into immunology of patients with arthritis).

He added that investigation was also taking place at a number of hospitals where treatment is carried out, such as Liverpool Royal Infirmary; Bristol Royal Hospital and the Royal National Hospital for Rheumatic Diseases, Bath; St. Stephen's Hospital, London; and West London Hospital.

Mosquito Campaign in Cyprus

Replying to a question Mr. D. R. Rees-Williams stated that recent reports show that the extermination of anopheline mosquitoes in Cyprus should be substantially complete by the end of this year.

Dentists' Remuneration

Mr. H. G. McGhee asked the Minister what alterations he proposed to make in the remuneration of dentists under the National Health Service.—Mr. Bevan replied: With the dental associations I am undertaking a full review of our present translation of the Spens Committee into fees for services. Meanwhile, as it is obvious that some dentists are earning far more than that committee ever contemplated, I am adopting a temporary arrangement whereby fees are reduced by half after a dentist reaches an income of £4800 gross—or £1000 in excess of the point at which the Spens committee said the risk of bad dentistry began. Doctors already have a limit, in the number of patients allowed on their lists.

Alien Dentists

Dr. S. Segal asked the Minister of Health how many dentists with foreign qualifications had been refused registration in this country; and whether he would consider the possibility of their recruitment for the school dental service.—Mr. Bevan replied: Approximately 1200 since 1935, when foreign dentists began to enter this country from the Continent in appreciable numbers. The Minister of Education has no objection to the employment in the school dental service of any foreign dentists provided that they are legally entitled to practise dentistry in this country.

Dr. Segal: Where any doubt may exist about the qualifications, could special facilities be granted for retraining, in order that they may equip themselves for entry into the school medical service?—Mr. Bevan: Dental schools in this country are already fully occupied in training our own people.

Mr. Vernon Bartlett asked the Minister why permission to practise in this country was still withheld from 33 dentists, refugees from Nazi oppression, now naturalised and living in this country.—Mr. BEVAN replied: The conditions on which foreign trained dentists may practise in this country are prescribed by the Dentists' Acts, and the duty of ensuring that these conditions are fulfilled rests with the General Medical Council.

Parkinson's Disease

Dr. SEGAL asked the Minister how many British subjects had been enabled to travel to Kassel to undergo the Voeller treatment for Parkinson's disease; on what basis they were selected; and what the results of treatment are to date.—Mr. BEVAN replied: No British subjects have so far been permitted by the United States authorities to travel to Germany for treatment by Dr. Voeller. I am arranging a full investigation into Dr. Voeller's claims. If these are substantiated I will see what can be done to ensure that the treatment is available to all sufferers from the disease. Dr. SEGAL: Could the Minister give some indication of the time when the report may be made available so that some of these people may look forward with perhaps some degree of justified hope to some remedy for their position?—Mr. BEVAN: I obviously could not give any date, because the experts who are investigating these claims must not be unduly hurried by Parliamentary pressure. They must satisfy themselves that there is something in the claim before any further steps can be taken.

Amendment of the National Health Service Act

Colonel M. STODDART-SCOTT asked the Lord President of the Council if he would give some indication when the promised Amending Bill to the National Health Service Act was likely to be introduced, as it was promised last session and there was no mention of it in the King's Speech. Mr. HERBERT MORRISON replied: That Bill is under consideration. I cannot say when it will be forthcoming, but it will not be this side of Christmas. The hon. member can be assured that it is not overlooked. I have every anticipation that it will be produced this session.

Health Centres

Dr. L. COMYNS asked the Minister of Health how many applications for permission to build health centres had been received from local authorities, how many such schemes in the London area had been approved as new structures and as adaptations of existing buildings, respectively; and whether he was satisfied that sufficient such centres were being constructed.—Mr. BEVAN replied: I have proposals for [illegible] new centres and have approved 1, in London. Discussions are going on in about 20 other cases. So far there have been [illegible] adaptations of old buildings approved. There are, however, a number of existing dental or medical clinics which have been maintained under the new Act. I am certainly not satisfied, but progress is governed by the building situation.

Specialists' Domiciliary Visits

Mr. L. W. JOYNSON-HICKS asked the Minister whether he was aware that medical specialists were, under the operation of the National Health scheme, limited to making a total of 25 visits per quarter in a given area upon patients; and what arrangements there were for the treatment of the patients in that area when the specialist had fulfilled his schedule.—Mr. BEVAN replied: There is no limit on visits. Remuneration has a provisional ceiling for each quarter while longer term arrangements—which will date back—are being worked out. The situation in the last part of the question can be considered if and when it arises.

Public Health

Diphtheria Immunisation

IN the first six months of this year more children were immunised against diphtheria by local authorities than in any half-year since the end of the war. They numbered 347,000, bringing the grand total for England and Wales to 7,567,574. The total for the important "under-five" age-group during the first half of the year was 288,000. The target for the year is the protection of 635,000 babies before their first birthday; because of the higher birth-rate, this is 45,000 more than that set in 1947.

Obituary

ARTHUR ROBINSON

M.D., LL.D. EDIN., F.R.C.S., F.R.C.S.E.

Professor Robinson, who had been living in the South of England since he retired from the Edinburgh chair of anatomy in 1931, died at Eastbourne on Dec. 3.

Born at Manchester in 1862, he was educated at Edinburgh University where he graduated M.B. with honours in 1883. He at once turned his attention to anatomy and in the same year he was appointed demonstrator to Sir William Turner. After two years he returned to Manchester as demonstrator in Owens College, and later he became lecturer in the Victoria University under Prof. A. H. Young.

In 1896 Robinson came to London on his appointment as the first whole-time lecturer in anatomy at the Middlesex Hospital. He quickly established his reputation as a rising young anatomist, and at short intervals he moved to the chairs of anatomy at King's College. London (1900), the University of Birmingham (1905). where he was also subdean of the faculty of medicine. and finally to Edinburgh (1909), where he succeeded D. J. Cunningham. In all these posts he displayed his talent for organisation and his powers as a teacher. while continuing to conduct important researches in his chosen field of comparative embryology. In 1920 he was Struthers lecturer of the Royal College of Surgeons of Edinburgh—he had received the fellowship in 1912—taking as his subject Prenatal Death: and the Royal Society of Edinburgh awarded him the Neill prize for 1925–27 for his contributions to comparative anatomy and embryology. From 1920 to 1922 he served as president of the Anatomical Society of Great Britain and Ireland. He was a fellow of King's College, London, and in 1924 he was elected to fellowship of the Royal College of Surgeons of England as a member of over 20 years' standing. He received the LL.D. from the University of Edinburgh on his retirement.

Of his work as an anatomist, J. C. B., to whom we are indebted for much of this memoir, writes: "Robinson's first paper on the position and peritoneal relations of the mammalian ovary appeared in the *Journal of Anatomy and Physiology* in 1887; others followed, and in 1890 he was awarded a gold medal for his M.D. thesis on development in two rodents. His work on the comparative anatomy of the placenta is embodied in three Hunterian lectures which he delivered to the Royal College of Surgeons in 1903. But as early as 1888 he was collaborating with A. H. Young in morphological studies including the development of the vascular system; and in 1902 they jointly contributed to the first edition of Cunningham's *Text Book of Anatomy*, being responsible for the sections on general embryology and the vascular system. Robinson himself succeeded Cunningham as editor of this work, and also of the *Manual of Practical Anatomy*, and he was responsible for the editions between 1910 and 1932. His editorial labours took up much of his time, but he continued to pursue the developmental problems that interested him, such as the formation of the ovarian follicle, the presence of lipoids in mammalian ova, and the development of veins, the last a subject on which he was a recognised authority.

Professor Robinson's preparations for retirement in 1931 were clouded by serious eye trouble which gave rise to much anxiety. But his friends were relieved to learn that a good measure of sight had been spared to him. His resilient spirit enabled him to overcome the disability that remained; and in these later years of his long life he quietly enjoyed the general reading for which during his active professional days he had had so little time."

E. B. J., a colleague who was long associated with him, adds: "Arthur Robinson was brisk and agile in all his movements—his students used to call him 'Dancing Arthur.' He was also alert and active in mind, and he displayed an immediate interest in any subject that was brought up. Ready and adroit in argument he was a competent advocate, and he held decided opinions—tersely expressed—especially on politics.

"Both staff and students found in him an understanding and helpful counsellor, and he was always accessible. As a second-professional examination approached, the unofficial tutorials which he gave, himself, to small groups were greatly appreciated; and, at all times, there was admiration for the speed and deftness with which he illustrated his lectures on the blackboards.

"In the year before he retired he learned to drive a motor-car; for he intended to spend part of his leisure wandering round the country in his car with his wife. But in his last summer of service the retina of one eye became detached; a cataract in the other eye was not then ripe for removal; and the first year of his retirement was spent in darkness—but without a grumble. It is noteworthy that, after light came back to him, his handwriting was more legible than it had ever been. Up till that summer, he played golf with zeal and zest during the whole of his sojourn in Edinburgh, except that he refused to touch a club while the Kaiser-war lasted. In his holidays and in his retirement after sight was restored to one eye, he was fond of long walks and also of gardening—he would have liked to have been a farmer—and as the 'incurable malady,' old age, grew upon him, his chief regret was that he was forced to curtail these activities."

Professor Robinson married Emily, third daughter of John Baily, in 1888, and she survives him.

WILLIAM HENRY BROAD

M.D. LPOOL

Dr. W. H. Broad, whose death at the age of 73 is announced, was well known in Liverpool as an orthopædic surgeon and as an anthropologist.

He was born and educated in Liverpool at the Institute and the university. After graduating in 1900 he held house-appointments at the David Lewis Northern Hospital and at the Royal Infirmary till in 1901 he received a Robert Gee fellowship which he held while acting as junior demonstrator in anatomy at the university. In the following year he was awarded a Holt fellowship, in physiology. The next two years he spent on travel, visiting the United States, Canada, Australia, and the Cape. At Stockholm and Berlin he attended clinics in orthopædic surgery and he returned to Liverpool to settle in consultant practice. Soon he was attracted to the treatment of injuries, chiefly by physiotherapeutic measures, and his interest in this branch of medicine remained with him until his death.

For many years he was in charge of the physiotherapeutic department of the David Lewis Northern Hospital, and during the 1914–18 war, as a major in the R.A.M.C., he was responsible for the rehabilitation department of the orthopædic centre at Alder Hey. A recognised authority in this branch of medicine, he became in the late war a regional consultant adviser in physical medicine in the Emergency Medical Service, being chiefly concerned with the hospitals in the North-Western area. He was an associate member of the British Orthopædic Association, and also a member of the Massage Advisory Committee set up by the Ministry of Pensions, and he often examined for the then Chartered Society of Medical Massage and Gymnastics. His *Rules of Massage* appeared in 1918.

"But a bald list of his achievements," adds a colleague, "is no indication of the character of the man. He was always a good doctor, who worked unceasingly for his patients and his hospital, and many improvements in treatment can be traced directly to his thoughtful suggestions."

Outside his work Broad was keenly interested in anthropology, and he was a fellow of the Royal Anthropological Institute. For him anthropology was a second career rather than a hobby. As early as 1901 he had described aboriginal Australian skeletons, and his later writings included *Heredity and Skull Form* (1913) and *Prehistoric Man* (1914). For several years he was also lecturer in physical anthropology at the university. For a time he was a member of the Liverpool county council and he was also a former president of the Liverpool Literary and Philosophical Society. His wit as a raconteur was appreciated at any social function.

Dr. Broad married Miss C. M. Hawkes, of Adelaide. The loss of their only son during the late war was a blow from which he never fully recovered.

Notes and News

REPRESENTATION OF SPECIALISTS AND CONSULTANTS

THE exploratory committee set up last July at the conference of representatives of the Royal Colleges, the Royal Scottish Corporations, and the British Medical Association, met at the Royal College of Surgeons on Dec. 10 with Sir Lionel Whitby in the chair. It was agreed that:

(1) It is essential in the interests of the consultants that a joint committee of the bodies concerned should be established to speak for consultants with one voice.

(2) The terms of reference of the joint committee should be: (*a*) to represent consultants and specialists in the impending negotiations with the Government on matters arising out of the National Health Service Acts and the report of the Spens Committee on the Remuneration of Consultants and Specialists; (*b*) to prepare and to submit for the consideration of its constituent bodies a scheme, including terms and reference, for the future work of the committee.

(3) Where a constituent body disagrees with the view of the joint committee on a proposal put forward to the committee, the constituent body shall be entitled to have its view represented to the Government, provided that, before any such representation is made, a conference between representatives of the joint committee and the constituent body is held in an endeavour to reach agreement.

(4) The joint committee should appoint joint secretaries to the committee, one nominated by the colleges and corporations jointly, and one by the British Medical Association.

(5) On the question of the composition of the joint committee it is suggested that it is desirable that in the representation of constituent bodies on the joint committee there should be representatives of both teaching and non-teaching interests.

The following composition of the committee is agreed: Royal College of Physicians, 3; Royal College of Surgeons, 3; Royal College of Obstetricians and Gynæcologists, 2; Royal College of Physicians of Edinburgh, 1; Royal College of Surgeons of Edinburgh, 1; Royal Faculty of Physicians and Surgeons of Glasgow, 1; Consultants and Specialists Committee established by the British Medical Association, 6.

NATIONAL (WAR) FORMULARY

THE N.W.F. Committee has decided that the third edition of the formulary shall be amended as follows:

Emulsion of liquid paraffin *B.P.C.* shall be deleted and replaced by emulsion of liquid paraffin *B.P.*

The synonym for emulsion of liquid paraffin and magnesia shall be deleted.

The suffix to emulsion of liquid paraffin with phenolphthalein shall be deleted and replaced by *N.W.F.* In the latter two preparations the emulsion of liquid paraffin that will be used will now be the *B.P.* emulsion.

It has been agreed that Jan. 1, 1949, shall be the date on which this amendment will come into operation.

INTERNATIONAL BIOLOGICAL CONTROL

ENTOMOLOGISTS from 10 countries, who lately met in Stockholm under the auspices of the International Union of Biological Sciences, have sent a resolution[1] to UNESCO and F.A.O. urging the need to provide "facilities for the development of basic research on biological control which will lead to the greatly extended use of natural enemies to control insect pests and noxious weeds, so helping to conserve world food resources." In support of their resolution the members of the Stockholm symposium point out that though insecticides have proved a powerful means of reducing losses of food their use involves a continued expenditure of money and labour. They are also not without danger to man and the domestic animals and may damage the crops they protect. The use of natural enemies for the control of insect pests and weeds, on the other hand, is economical but entomologists are handicapped by their meagre knowledge of the important natural enemies that exist in different parts of the world. An international organisation is thus essential, for biological control can best be effected by introducing natural enemies from one region to another. The Stockholm resolution suggests that the following services should be set up at once; a documentation service for the collection and dissemination of pertinent information; a taxonomic service to identify natural enemies; a survey service to study the natural enemies in major regions; and later an application service to collect, breed, transport, and acclimatise natural enemies in regions where the nations concerned are unable to carry out this task. The work of the international organisation, the resolution ends, would be an extension to other countries of what is already being done in Britain and in America, and it would coöperate with all existing institutes.

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[1] *Science*, Nov. 5, p. 512.

EXPERIMENTAL PANCREATICOGASTRECTOMY

ADDRESSING the Liverpool Medical Institution on Nov. 25 Mr. David Annis said that in pancreaticoduodenectomy for carcinoma of the head of the pancreas or of the common bile-duct, after excising the head of the pancreas, the terminal common bile-duct, and the duodenum it was necessary to re-establish the biliary, intestinal, and pancreatic flows. An experimental study had been made to find a better site for the reimplantation of the remaining pancreatic tail after excision of the head. The pyloric end of the stomach was selected because the reaction is acid and there is no enterokinase to promote the action of trypsin. In six dogs the pancreas was divided at the neck and the cut surface of the tail implanted through a hole in the anterior wall of the pyloric end of the stomach. All the dogs recovered from the operation. One dog died on the 51st day; five were well and well-nourished when killed on the 15th, 45th, 45th 49th, and 66th day. Pancreatic amylase was collected from the implanted pancreatic tail. Some atrophy of the implanted pancreas took place in three dogs. In the dog killed on the [illegible]h day there was continuity of epithelium between the gastric and pancreatic-duct mucosa.

ASSISTANT NURSES

WOMEN with the appropriate nursing experience who failed to apply for admission to the roll of assistant nurses before the closing date (Feb. 3, 1946) now have another chance to do so under the waiver rule recently passed by the General Nursing Council. The new closing date is Dec. 31, 1948, but this concession applies only to women who are at present engaged in nursing duties. The closing date for applications from assistant nurses with "intermediate qualifications"—that is those who have obtained appropriate experience since March, 1943—is Jan. 1, 1949.

The Ministry of Health [R.H.B. (48) 91] appreciate that many hospitals are at present employing probationers and assistant nurses who will not have completed the prescribed period of experience in time to claim enrolment, but there will be no objection to regional hospital boards continuing to employ these women at their present rates of pay for the time being. The Ministry hope that revised arrangements for the training of assistant nurses, which are being considered by the General Nursing Council, will attract this staff and other nursing auxiliaries to take the training and gain admission to the roll. But if they fail to do so further consideration will have to be given later to regularising the position of these nursing auxiliaries.

OLD AND NEW

THE Hospitals Year-Book for 1948 [1] is a meeting-place of the past and the future, and it will be of special value as a reference work this year while the new groupings and provisions of our hospital services are still unfamiliar. The directory section has been doubled in size, and the hospitals are shown, not only under their old headings of voluntary and municipal, but also in their new array under regional hospital boards and boards of governors. The two directories have cross-references, and any hospital may quickly be found under either system. This section also includes lists of the regional areas, the disclaimed hospitals, and the members of the three health service councils. Short surveys of the Health Acts for England and Wales, for Scotland, and for Northern Ireland are included.

Besides these records of fact the yearbook contains a series of special articles on aspects of the new service from different viewpoints, including one by Sir Allen Daley on the work of local health authorities. In another section are reproduced memoranda, from the British Hospitals Association with other bodies, on such subjects as the recruitment and training of nurses, and appointments for outpatients.

MEDICAL WAR RELIEF FUND

DURING the year 1947–48 this fund has distributed £6663 among 42 applicants, 20 of whom had previously received help. As in earlier years, most of the grants were made to help doctors to re-establish themselves in civil practice (18 applicants) and widows with the education of children (15 applicants). A grant which is to be paid over a period of time or is for school fees, is administered through the Royal Medical Benevolent Fund, and 12 grants amounting to £1696 were made in this manner. From time to time the distribution subcommittee reviews the progress of cases helped and every effort has been made to keep in touch with all the cases where children are concerned and to ensure that their education is progressing. The statement of accounts in the annual report shows that the fund still has a substantial unspent balance and, as has already been announced, the committee thinks it unnecessary to seek further contributions at present.

ON ARRANGING FILM SHOWS

TWO new leaflets give practical help to those responsible for arranging film shows. *Notes on How to Borrow Films* gives detailed instructions on how to set about borrowing and returning films listed in catalogues. *Notes for the Secretaries of Medical Societies on Organising Medical Film Programmes,* to which we referred on Aug. 28, is even more detailed: armed with this pamphlet secretaries can confidently set about arranging their first film show, for guidance is given on programme planning, organisation of hall and projector, entertainment tax, and other problems, and six specimen programmes are included. Both pamphlets are published by the Scientific Film Association, 34, Soho Square, London, W.1; the first is free, the second costs 1*s*.

University of London

The governing body of the British Postgraduate Medical Federation have appointed Mr. L. E. C. Norbury, consulting surgeon to the Royal Free Hospital, to be regional adviser in postgraduate medical education for the North-West Metropolitan hospital region.

University of Dublin

On Dec. 9 at the school of physic, Trinity College, the following medical degrees were conferred:

M.D.—Emanuel Howitt, Sheila Sheehan.

M.A.O.—J. D. Llewellyn-Jones.

M.B., B.Ch., B.A.O.—M. D. Bamber, S. D. Boland, E. M. Clein, G. N. Constable, John Diamond, Winifred D. Eadie, P. F. Eustace, M. H. Fruithof, E. A. Jackson, J. S. P. Lane, W. H. Leon, J. K. McCall, Peggy Moore, K. C. Mullen, Dorothy I. Ogden, T. M. W. Redman, Ivy P. Robinson, S. F. Shilliday, Olivia M. Welsh.

Royal College of Physicians

Dr. C. J. Gavey, will deliver the Goulstonian lectures at the college, Pall Mall East, S.W.1, on Tuesday and Thursday, Jan. 11 and 13; at 5 P.M. He is to speak on the Cardiology of Old Age.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on Dec. 6, with Dr. W. R. Snodgrass, the president, in the chair, the following were admitted to the fellowship:

John Douglas Aitchison, Robert David Campbell Brackenridge, James Howie Haldane, George Johnston, Walter Phillips Kennedy, Hector Robert Ferguson Macdonald, John Rankin, *qua physicians*; Hugh Alec Benjamin, Jacob Cohen, William Young Cornock, John Malcolm McBride, James Dunlop McCardel, David Moffat Macdonald, William Macintyre, Neil McLean, Roderick George MacLeod, Robert George Main, Alister John Miller Mathieson, Abraham Bernard May, Kenneth Miles Mayall, Ian Pinkerton Munro, Thomas Anderson Ramsay, Robert Paul Schach, James Moffat Scott, Donald Malcolm Sinclair, Robert Baury Watson, Thomas Murray Welsh, William Frame White, *qua surgeons.*

Commissioned Rank for Australian Pharmacists

The *Pharmaceutical Journal* (Dec. 4) reports that the Australian army has accepted the principle that every pharmaceutical chemist serving in a professional capacity in the Australian Army Medical Corps shall hold a commission. The supervision of the storage of drugs and medicines, as well as their dispensing and distribution, are to be undertaken only by registered pharmaceutical chemists.

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[1] Edited by J. P. Wetenhall, B.A. From the British Hospitals Association, 52, Green Street, London, W.1. 1948. Pp. 319. 21*s*.

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THE AIMS OF MEDICINE*

E. D. ADRIAN
O.M., M.A., M.D. Camb., F.R.C.P., F.R.S.
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF CAMBRIDGE

IN Marlowe's play *The Tragical History of Dr. Faustus* the first scene opens with Faustus alone in his study at the University of Wittenberg. He is already famous for his learning, but the time has come to decide whether he should settle down as a philosopher, a doctor, a lawyer, or a theologian. He dismisses philosophy as empty disputation. Medicine seems attractive at first for reasons which even now have not lost all appeal, though we might be loth to state them quite so openly:

> "Be a physician Faustus, heap up gold
> And be eternised for some wondrous cure."

But then he reflects that "The end of physic is our bodies' health," and that does not satisfy him. He has already discovered remedies

> "Whereby whole cities have escaped the plague
> And thousand desperate maladies been eased,
> Yet art thou still but Faustus and a man.
> Could'st thou make men to live eternally
> Or, being dead, raise them to life again,
> Then this profession were to be esteemed:
> Physic farewell."

After this it is not surprising that he finds theology and the law equally futile, and so he turns to the black art and sells his soul to the Devil. Faustus was hard to please and suffered for it. We have chosen a less exciting career, and though we cannot make men immortal there are few of us who come to regret our choice. But in these days Faustus might think differently. The rewards of necromancy would not seem so attractive, for natural science has deprived the Devil of that particular bait. On the other hand, social science would have hard things to say about the elixir of life—its economic and political consequences might be worse than those of the atomic bomb.

The fact is that with advancing knowledge the prospect in every direction has become less rosy and less extensive. What are the prospects for medicine? We need have no doubt that its practice now is a worthy and satisfying occupation; but it is worth looking ahead and considering what it is likely to become.

Our task at present is to keep men healthy and free from pain and to give them a reasonable span of active life. It keeps us fully occupied, and on the whole we are reasonably successful. There is a great deal more to be found out before we shall be able to guarantee most people a healthy life and a painless death, barring accidents; yet medical science has progressed so rapidly in the past hundred years that in another hundred there should be very little bodily disease that we cannot prevent. That side of the picture is bright enough; but there is the other, that of the diseases of the mind—not so much the gross disorders of thought but the conflicts which all of us suffer to some extent. We ought to aim at making men not only free from bodily pain but also as contented as the circumstances will allow them to be. In this field the advance is likely to be slower and the prospects are less certain. Disorders of the spirit seem to involve theories and ways of prevention and treatment which must take us into quite new fields, away from the laboratory and the hospital ward and into the psycho-analyst's parlour or even into the psychosurgeon's operating-theatre.

Before we venture so far, however, I must try to justify so much optimism about diseases of the body. It may seem far too rash to suggest that in a hundred years or so the progress of medical science will have emptied the hospitals of all the ailments which we have to treat now, with the result that nothing but traffic accidents and psychoneuroses will be left. The layman who has a cold in his head or pains in his joints may say that medical science has not progressed at all, so far as he is concerned. But the fact is that in these last hundred years medicine has advanced quite as rapidly as all the other branches of natural science, and that is saying a great deal.

PROGRESS OF MEDICINE

A hundred years ago electricity was just beginning to be used outside the laboratory and chemists were still not agreed whether they should write the formula of water as HO or H_2O. There was very little basic science on which to build physiology or pathology. The doctors of that time, like the chemists, were just as good, probably better, observers than we are now, and just as sharp-witted; but they had a far smaller range of significant knowledge to which their observations could be related. So medicine was largely skilled prognosis based on history and clinical signs rather than on laboratory findings. Micro-organisms were unknown, and young men and women died of consumption in the natural course of things. But the change had already begun, in medicine as in physics and chemistry. Cholera was spreading in Europe, but a recent epidemic in London had been traced to sewage-contaminated water, and Chadwick was trying to force public-health measures on an apprehensive but indignant public. Anæsthetics had just begun to make new possibilities for surgery, though Lister did not introduce antiseptics until 1865. Physiology was still mainly the anatomy of the circulation and the study of frog's muscle; but it was beginning to move, for the effect of the vagus on the heart was discovered in 1845.

Contrast that picture not with what we know nowadays about disease but with what we can actually do to prevent and treat it, and I do not think anyone can be dissatisfied at the progress of medicine, or anything but optimistic about its future. It is not merely that most of you can confidently expect not to die young—it would have been a different story in 1848—but the important thing is that the advance goes on and is now going faster than ever it did before. In the last ten years, for instance, the sulpha drugs and the antibiotics have come into use, with the result that pneumonia and cerebrospinal meningitis and septicæmia have lost most of their terrors. Operations on the most vital organs—the heart and lungs and brain—have passed the experimental stage. Anæsthetics have become almost a pleasure instead of an ordeal, and morbidity from severe injuries was far less in the second world war than in the first. These are some of the advances which are most dramatic because they help to cure the sick man, but the advances in prevention have been no less remarkable. Large areas of the world are becoming safe and comfortable to live in because the insect carriers have been marked down and destroyed or antidotes found for the diseases they bring. The cure of scrub-typhus by the antibiotic chloromycetin is the latest example. If all goes well—and wars which stop short of destroying civilisation altogether seem if anything to accelerate the advance—the medical student of the year 2050 will have very few of the existing bacterial and protozoal diseases to study. They will be curiosities, as gout, smallpox, and tertiary syphilis are to most of the present generation.

No doubt the doctors of the next hundred years will have other cares. We cannot be sure that they will know how to stop the virus diseases. New plagues may arise, as epidemic encephalitis arose in 1918. The disorders of the elderly body—cancer, paralysis agitans, heart disease, and the failure of sight and hearing—

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* Opening address of the session at the Welsh National School of Medicine on Oct. 5.

6530

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neurosis and a further [illegible] minor neurosis causing absenteeism during the six months before the investigation; [illegible] of the patients attending medical outpatient clinics are said to be really cases of psychiatric disorder: 1 child in [illegible] is likely to spend some time in a mental hospital, and 1 in [illegible] will have a nervous breakdown.

There is nothing here to encourage the belief that we are treating these disorders much better now than they were treated fifty or a hundred years ago. It looks as though recognition of their cause has not done much to remove it, and we should certainly find it hard to produce convincing evidence of a real improvement in the way neurosis is dealt with. But, in spite of that, I think everyone who has had much experience in these cases would agree that there has been a real improvement. There are certainly encouraging signs.

There was the much smaller incidence of gross hysterical symptoms and of persistent severe neurosis in the recent war compared with that in the 1914–18 war, and there is the much greater appreciation by everyone—public as well as doctors—of what neurosis can do. After all, it is only within the last fifty years that psychological medicine has had an adequate theory to build on. Before Freud there were descriptions like Weir Mitchell's "neurasthenia" and Janet's "restriction of the personality," but nothing that held out much prospect of explaining the particular symptoms which the neurotic might happen to develop. Today every film-goer knows about the unconscious—at least about its more respectable manifestations—and another sign of more widespread knowledge was told me by a magistrate who said that nowadays it is almost the rule for a convicted prisoner to ask for more favourable consideration because of the psychological mismanagement of his early childhood.

The small incidence of neurosis in the war was due partly to the more effective weeding-out of the men who would not have been able to stand the strain. In peacetime the strains are less intense, but we are not [illegible] to meet them as we are in war. The same kind of vocational selection will certainly help in peace, but no-one supposes it will banish neurosis entirely: and for the treatment of severe illness the methods which psychological medicine has evolved are either very elaborate, like psycho-analysis, or else dependent on the personality and enthusiasm of the doctor. There will always be successful psychotherapists whose effectiveness depends not on the particular theories they hold but on their general relation to their patients, much as there will always be mothers and nurses who will bring up their children well without considering how they are doing it. What we still lack in psychotherapy, as in infant training, are the definite rules which can be learnt and applied by all of us, the formula which will make it possible to treat the patient on the intellectual level without any emotional exchanges. Greater understanding of psychological processes will make that easier, but there is not much indication that the methods required for dealing with an obsession will ever be as straightforward, as reducible to a formula, as the methods needed for a streptococcal infection.

OLD AGE

There is one class of mental trouble which is in a special category and where the prospects are on the whole much better. In the near future we shall have to think not only of the people who go through life with what is called the psychopathetic temperament but also of the large number of normal but elderly people whose lives we have prolonged. There is one of Swift's satires in which Gulliver on his travels comes across the miserable people known as the Struldbrugs, who were born with the mark of immortality on their foreheads and were immune from death but not from old age and all its consequences. It is not a picture we can afford to neglect when we congratulate ourselves on having extended the range of life. All of us, whatever our temperament, may have good cause to be unhappy, when we are old, because we have lost our friends and are not wanted, or because we are losing our hearing, our memory, or our self-control. Let us therefore hope that we shall soon have learnt how to look after the ageing body so that nothing much goes wrong with it until the final complete break up. We must learn to emulate the car manufacturers whose products were constructed to give good service for three years and then to break down so comprehensively that the owners were spared all the anxiety of repairs and had no other course but to order the new model. It is not too much to expect that we shall soon know enough to avoid the particular habits which make us live too long for comfort, which keep our hearts going after our mind has failed. At all events the problems of old age are primarily physical, a matter of arteries and cell degeneration rather than of repressed hopes and fears.

PREFRONTAL LEUCOTOMY

In the present state of our knowledge the former sort of disorder seems more likely to be preventable and curable than the latter: but one can make too much of the distinction between mind and body, and the recent trend in psychiatry has been towards the physical treatment of mental trouble. In fact one recent development aims at the mind by deliberate interference with the structure of the brain. This is a branch of neurosurgery which is still in its infancy, and no-one would be rash enough to guess how it will grow. But already it raises important issues with which the medicine of the future will be more and more concerned.

In a sense the issues are not so new. Medicine has always claimed the right to treat disorders of the spirit. When the temperament and emotional state were related to the colour of the bile, they bled and purged the sanguine and choleric, and tried to lighten the dark humours of the melancholic. So now, when we carry out a prefrontal leucotomy in a patient whose anxieties are too much for him, we are not trying to alter his character any more than the medieval physicians did in their day. However, the fact remains that we can do it more effectively and more permanently. By destroying the nerve-fibres in the frontal lobe of the brain we can make people less anxious, less preoccupied with the unfortunate state of the world, less worried by their doubts and failures. They become care-free, self-satisfied, less sensitive, less of a burden on themselves and other people. Sometimes the results are far less satisfactory, but Moniz's operation has had spectacular successes which cannot be overlooked. It has been used for other things besides the obsessions of the psychasthenic. Prefrontal leucotomy can be done, for instance, to make the pain of inoperable cancer more bearable: for, though the pain is still felt, the effect of the leucotomy, when it succeeds, is to make it no longer so distressing. No-one would grudge that sort of relief: but in the relief of anxiety we shall have to go rather carefully. The problem is to decide where to stop—how much responsibility to leave. Rylander has cited some interesting cases to show what may happen. The nurse who worried herself into a breakdown about the treatment of her patients became after a leucotomy a happier but a less careful nurse, better fitted probably to look after a convalescence than a serious illness. The mechanic whose spare time is spent in sociology and economics settles down to football pools and family life. No doubt we shall learn in time to remove just the right amount of morbid anxiety so that the patient becomes reasonably care-free and also reasonably careful. After may still menace our retirement. A pessimist might list a great many chronic ailments which we have not yet begun to understand because it is so much harder to trace the causes of slow changes than of rapid. He could also point out that we have always been too optimistic, and that very few of the advances made have fulfilled all expectations. The discovery of antitoxins seemed at first to hold the key to the treatment of bacterial disease, but there are only two diseases—tetanus and diphtheria—where they can be used. The vaccines raised the same hopes and have had only a limited success. The hormones and vitamins can be used with great effect but they cannot be used for everything. Even penicillin and the sulpha drugs are not cure-alls.

UNIVERSAL REMEDIES

The argument would be good if all our hopes had to be centred on one particular line of advance. It is true, and a pity, that many such hopes have been dashed, but the really encouraging thing is that nowadays the failures scarcely matter because the advance is on such a wide front. Medicine is already so much of a science that we have almost ceased to think of it as magic. But it was magic to begin with, and the idea is so deep-rooted that it is difficult to give up the hope of finding the elixir of life or—what comes very close to it—a universal remedy and a universal cause for disease. We have, even now, to be very careful to get it out of our heads that each new method of treatment will cure everything. In the nineteenth century the tendency was far greater. Almost universal claims were made for Hahnemann's homœopathic system of treatment—*Similia similibus curantur* (like cures like)—for water cures and nature cures, and for the treatment of the spinal lesion of the osteopaths. And more orthodox medicine was little better. All harmful agents were to be extracted from the body by bleeding and purgatives in the age of Broussais, and not so long ago toxæmia was the root of all evil and the surgeons dealt with it by removing everything they could get at, including the large intestine.

Naturally the public has always taken to the idea of universal remedies. Many of us can recall our reverence for the family physician of our childhood bringing the magical stethoscope out of the top hat and prescribing the tonic which would make us well again; and the chemists' shops with the mysterious bottles of coloured fluid in the windows, and the astrologers' signs, where you could buy the rings which would charm away the rheumatism, and where you might expect that they would have some of the elixir of life under the counter. With so much magic in the air it was not surprising that some of the claims made for new treatments reflected the same kind of day-dreaming; but the glamour has worn thin in a scientific age, and the great thing to be thankful for is that we can afford to do without it. We can be sceptical about universal remedies without losing our belief that almost all bodily disease will find some remedy, or, better still, that we shall find some way of preventing it.

MENTAL DISEASES

No doubt some mental diseases will disappear in the same way. General paralysis of the insane is already a rarity because it has been traced to an infection which can be prevented or cured. There are others depending on chronic poisoning or on vitamin deficiency which should be equally amenable, and others where the symptoms run a definite course suggesting some bodily disorder as their cause. The deterioration of the schizophrenic and the cycle of manic-depressive psychosis have not yet been related to any organic change, but there is nothing about them to make us stop looking
for some physical cause. What we have to fear
that we shall be unable to deal with such definit
orders, but that, in spite of all we can do, many
people will still be tormented by their hopes and
This is where the prospect is still rather unce
Have we really advanced very much in the treat
and prevention of neurosis in the past hundred
and are we advancing now? A great deal has bee
and written recently about the men and women
Victorian age. Many of the great ones of that
have been displayed with human failings and
fortunes. They did not get on with their chi
they had grievances, or they drank too much.
on the whole they and our own grandparents d
seem to have had worse difficulties, to have bee
well balanced and less contented than we are now
spite of modern nurseries some children still fea
dark, and stammer, and bite their nails, and
grown-ups sleep badly and commit suicide.

It is difficult to compare then and now, and stat
do not help. If there were any they would al
certainly show a great increase in neurotic il
during the present century, but that would be m
a matter of more confident diagnosis. We believe
that a great deal of indigestion, headache, lassitud
the symptoms in the patent-medicine advertisem
may be due to mental rather than physical ca
and many of the unexplained illness of the Victo
would now be classed as functional. To have recog
this is certainly an advance. I remember Dr. J
Taylor, the friend of Hughlings Jackson, te
me of the introduction of Babinski's sign into cli
neurology in 1898. Before that there was no si
test to distinguish a functional paralysis of the
from an organic paralysis due to a lesion of the pyran
tract. Babinski showed that after a pyramidal le
the great toe moved up instead of down when the
of the foot was scratched. His sign was a godsen
the neurologist; it must have kept many pat
from a lifetime in bed and spared their relations
trouble of nursing them. Nowadays most doctors
be trusted to recognise the commoner manifestation
neurosis, and hysterical paralysis is so easily recogni
that it is rarely attempted. But, when hyster
paralysis was more common than it is now, there
nothing so flattering to the young neurologist as
almost miraculous recovery he could produce in a pat
who seemed hopelessly bedridden, and nothing
deflating as the realisation that the patient was not m
the better for having the use of his limbs again,
he was in fact a good deal more unhappy than bef
when he had some obvious claim to sympathy. H
for example, is an extract from a recent paper
spasmodic torticollis, a curious complaint which see
to have a psychopathic origin:

> A patient had been treated by a partial analysis and
> lost all his spasms. He wrote later: "In the last few w
> I have had no movement in my neck, but I would m
> rather have it because I now have terrific anxiety. I c
> sleep, and when I sleep I have nightmares. I would m
> rather have my torticollis and have the movements of
> neck."

These functional symptoms, most of which can
dispelled in one way or another, are certainly less comm
than they were thirty years ago, but I am not sure th
the less striking disorders, such as headache and nervo
dyspepsia, are treated more successfully because we kn
that they are neuroses. The statistics are certain
rather alarming. It has been stated, and not contr
dicted, that from a third to a half of all medical inval
discharged during the war were discharged on psychiat
grounds, and that in conflict the figure might rise
three-quarters of the casualties. In industry a surv
of 3000 workers showed 10% had had definite disabl

interfering in matters which are outside their special province and blamed when anything goes wrong because they have not interfered. And, although we can confidently expect that they will make mankind much healthier, it will need constant vigilance to keep it so—perhaps a constant struggle to prevent new diseases or variations of old ones, at any rate constant research and a good deal of disappointment.

We can confidently expect that mankind will be kept much healthier in body and, in spite of the doubts I have expressed, we can look for a great improvement in mental health as well. I should like to think that mankind will be the happier for this, yet as a biologist I am not so sure. Mankind will be more active no doubt and longer-lived; there will be less absenteeism in industry and fewer patients in mental hospitals—they will be better specimens of the genus *Homo sapiens* in fact. But happiness or even contentment is another matter. The adaptability of the living organism has been mentioned already to explain why we are not constantly discouraged at some of the inconveniences of life nowadays; it explains also why we are not constantly happy at the thought of the diseases we are escaping. In man adaptation is largely the affair of the brain. Living cells in general show remarkable powers of adapting themselves to their environment so that they can continue with their normal cycle of activities in all sorts of circumstances; but in the complex organisms, and in man in particular, the individual cells do not need a wide range of adaptation, for the organism can keep the immediate environment relatively constant. With man the immediate environment of the cells is perhaps the most narrowly adjusted of any mammal, but our brains have made it possible for us to live in an immense variety of conditions. Owing to the contrivances we make we can live in places where it is very hot or very cold (outside the immediate surroundings of our bodies), where there is no daylight, no food, and no oxygen. In the last hundred years we have constantly extended the range of our environment. For a cat it is a house, some roof-tops, and a garden; but for a man it is no longer a village or even a country. We can travel as fast as sound, we can hear what is said 1000 miles away, and we shall soon be able to see what is happening there as well. Yet these changes in the scale of our activities are at once assimilated by the brain and are accepted as the natural way of life. They cause no permanent change of mood, and we have no reason to suppose that we are happier than our grandfathers because we can do so many things that they could not. So with increased health: we suit ourselves to the world we are in and to the experiences it gives us; we have less disease and live longer now than they did a hundred years ago; there is much less chance that our children will die young, or that we shall have to face a great deal of pain; and we have all sorts of facilities for living comfortably—better food, fewer unpleasant smells, and so on. But I do not think anyone would be bold enough to say that the world is a happier place for us now than it was then—apart altogether from the particular circumstances of these last few years. Undoubtedly the many people who lived in such miserable conditions in the industrial districts a hundred years ago, and the many who were dying of famine in Ireland in 1846, must have suffered conditions too extreme for adaptation; but an improvement in health will not prevent overcrowding and famines, and did not prevent the widespread unhappiness of the workless twenty years ago.

For this reason I think we shall be deluding ourselves if we suppose that what we are going to do in the next hundred years will lead to a permanent increase in the happiness of the human race. I fancy that life will be much the same mixture of happiness and unhappiness that it is now—that our moods must always tend to oscillate about a position of equilibrium which does not greatly depend on external circumstances. And our brains will always tend to drive some of us to act up to the limit of what is possible. Medical science may give us more control over the mind as well as over the body, but it will not be able to change the general principles which govern its working. For the present I think we had better leave happiness out of it, though our contributions to that will not be worth nothing at all. What we can be sure of giving is a more vigorous life for mankind and a greater freedom from physical pain; and if we can give more than this, so much the better for everyone.

ENVOI

If Dr. Faustus had to make his choice now, would he find medicine any more to his taste? He might still heap up a certain amount of gold as a specialist, but he would still have no hope of making men immortal or raising them to life again. On the other hand, he was ambitious and eager for new experience and for power over his fellows; and the medicine of the future would give him opportunities for influencing mankind in new and unexpected ways, of controlling their general character and the kind of lives they would lead. He might find himself charged with the task of regulating the increase of population and of trying to control heredity and environment in such a way that there would be just the right proportion of rebels and eccentrics to keep the human race from stagnating. He might become a psychiatrist, for he would find that the study of the human mind raises problems worthy of even his ability. And of course if he turned to the laboratory there would be the immense field of research into all the processes of life, with all the new methods of investigating them.

For us ordinary people that I am sure will be more than enough. For Dr. Faustus I am not so sure. His subsequent career in Marlowe's play suggests that, if he chose a scientific career, it would be in physics with its cosmic problems rather than in physic with its human ones. Mephistopheles might then tempt him with all the possibilities of atomic disintegration, and the play might have an even more spectacular end. Mephistopheles will no doubt supply the appropriate temptations for those of us who have chosen medicine, but he will not be able to persuade us that its future practice will become less interesting, and that its future aims will not be worth pursuing with all the energy we can give.

A DRUG SENSITISING THE ORGANISM TO ETHYL ALCOHOL

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EXPERIMENTS in these laboratories with diethylthiuramdisulphide [bis (diethylthiocarbanyldisulphide)]—formula $(C_2H_5)_2$ N C (S).S.S.C (S) N $(C_2H_5)_2$—showed that people who had ingested 0·5–1·5 g. of this substance (an otherwise inert dose) developed characteristic symptoms when they subsequently drank even small amounts of alcohol. These symptoms include a feeling of heat in the face, followed by an intense flushing, located principally in the face but spreading in some cases to the neck and upper part of the chest and arms or even to the abdomen. A constant effect is dilatation of the scleral vessels, making the person look "bull-eyed." These are followed a little later by palpitations, and sometimes slight dyspnœa. After larger doses of alcohol nausea and vomiting often develop. If nausea is intense, blushing gives way to pallor. These symptoms, which are usually accompanied by headache, are very unpleasant. They disappear, however, within a few all, they had the same sort of doubt when anæsthetics were first introduced, arguing that pain in childbirth was good for the character. We seem to have decided now that all bodily pain is evil and should be suppressed, and perhaps we ought to feel the same about mental pain. Hamlet would no doubt have led a happier life after a leucotomy, and the state of Denmark might have been little the worse.

REGIMENTATION

This problem of mental health and responsibility is not bound up with any particular method of treatment. It is well illustrated by what happens after a leucotomy, but any method of influencing the mind must involve some idea of the sort of mind to aim at. We have fairly clear ideas of bodily health, we can decide when medical aid is worth while to bring the bodily efficiency back within the accepted range. And we are not likely to make too standardised a product. So far as the body is concerned, the extreme variations which are likely to go are all things which will not be missed, like the adenoid face, the bandy legs of rickets, and the signs of congenital syphilis, that have now almost disappeared. But mental health is a much more difficult matter. If it can only be achieved by a comfortable uniformity, by ironing out all the rough experiences of our mental development, by making us unambitious and contented with our lot, we might very well hesitate to try to impose it. How much unhappiness and discontent should be regarded as within the acceptable range for a particular person? When does eccentricity and antisocial conduct become a matter for medical care? To what lengths should we go in bringing up our children so as to prevent their becoming saints or rebels, to ensure their settling down comfortably as respectable citizens? If medical psychology advances with the rest of medical science it may well give us the power of influencing these things to a far greater degree than has ever been possible before. Even now, for instance, UNESCO has teams of psychologists engaged in research on the tensions which lead to war. If the spirit of aggression could be prevented by adding some pacifying vitamin to everybody's diet, should we take this step to prevent it? I suppose we should if it were quite certain that some countries would not veto the proposal for their own citizens.

Clearly this kind of decision, which involves altering the character of mankind, will involve medicine in heavy responsibilities. But the prevention of serious mental disturbance, like that of bodily disease, is bound to involve more and more interference by the medical profession in the lives of people who do not regard themselves as ill, and in the upbringing of their children. The Ministry of Health may be called on to ensure healthy food for the mind as well as for the body. Not too much news about murders and suicides, as well as enough vitamin D in the margarine. There may have to be more and more regulation of our mental activity, the hours we keep, the colour of our rooms, and the music we should listen to. There would be nothing very new in such proposals except their aims. After all, in Plato's republic the only kind of music that was to be permitted was martial music to encourage the aggressive spirit of the citizens. It is at least a sign of grace that we are now led to think of a world where the aggressive spirit will not be so essential to survival.

Would this sort of interference with the mind be too great a price to pay for increased mental stability? Few of us would want to be the priests of a new religion which will dictate how men ought to use their minds, even though we believe that they might use them better than they do now. But, whether we like it or not, we have to face the prospect that the control of individual liberties by experts must become more and more an accepted part of civilised existence—and the experts will be the doctors and psychologists as well as the economists and politicians and lawyers.

After all, prevention—and that is what the medicine of the future must aim at—cannot but involve a great deal of control of what people may do. Even now we impose countless regulations on the public: they may not spit in railway carriages, they may not enter certain countries without inoculation and vaccination, and the quality of their food and their houses and sanitation is decided for them. How long shall we allow them to sneeze in public or to drive a car when they are angry or sleepy? As we come to know more and more about prevention of disease and accident we shall have to make more and more regulations to see that they are prevented.

And our functions must extend to more than the prevention of disease. If infant mortality is greatly reduced in countries where the birth-rate is high and the standard of life low, there will soon be too many people to feed. Already the control of malaria is beginning to increase the population to an alarming extent in certain areas. We can scarcely rely on the famines and wars of the next hundred years to keep the population of the world within limits. It must be controlled somehow by propaganda, by economic pressure, even by penalties or drugs. However it is done, birth control will be a medical concern, though the problem of adjusting the population to the resources of the country will call for all kinds of expert knowledge and for decisions at the highest levels of government.

It is easy to paint a horrible picture of the cold-blooded doctor and scientist of the future prescribing every detail of the lives of a population which has been made docile and uniform by correct dieting and upbringing (if not by operations on the brain), and has been adjusted as regards numbers so that there is a place for everyone, and everyone in his place: there have been many utopias which seem to have been devised to produce just that kind of society, and very few people can have wanted to live in them. But the prospect is really not so bad. The human brain confers on us not only an amazing power of controlling our circumstances but also an amazing power of becoming adapted to them. Our activities nowadays are already regulated to make us fit into an extremely complex framework. There are all sorts of things we must and must not do, but we have learnt to accept most of them without really giving up any of the freedom and variety of our lives. Most of the new controls which have been imposed by the State have seemed at first to be an unwarrantable intrusion on the private lives of the citizens; but after a time, if the control has turned out to be reasonable and necessary, it has become part of the normal framework, and people have ceased to resent it. You have only to read the outcries which greeted the early attempts to impose education and sanitary legislation on this country to realise that our standards of what constitutes liberty can change fairly rapidly, and that no-one is much the worse when they do. We are just as resentful over new controls which seem to deprive people of their personal freedom, but we do not give much thought to the old ones. Though we may have more forms to fill in and more cards to carry about, I think most of us feel, and are, as free as our grandfathers, as angry at everything which seems an encroachment on our liberty, and as superior to the inhabitants of other countries where they have a different list of restrictions, or where they are not encouraged to grumble so much.

THE FUTURE

The doctors of the future will be in authority over mankind and cannot expect to be popular. Since there will be little serious illness, they will miss the gratitude which comes their way when they happen to have done their job without bungling. They will be accused of stinal tract or to fixation in the tissues after absorpn. The latter alternative is the more probable.

MODE OF ACTION

Several hypotheses to explain the similar effects of anamide have been suggested (Le Monaco 1918, esse 1921, Dittrich 1924, Glaubach 1926, Thiery 1942). l of them, however, seem poorly founded, and we ve been unable to reproduce the observations on which ese hypotheses were based when antabuse was given animals.

Some of the effects observed are very similar to those histamine, but no rise in blood-histamine level was und after the administration of antabuse and alcohol. oreover, bronchodilatation was observed, whereas stamine produces bronchoconstriction (Asmussen et al. 48a).

The symptoms can, however, be fully explained by an creased formation of acetaldehyde after the taking of cohol by people previously treated with antabuse. nall amounts of acetaldehyde are found in the blood en in normal people after taking alcohol (Stotz 1943). people who have taken antabuse the blood-acetaldeyde level rises to about two to five times that in normal ople who have taken the same dose of alcohol (figs. 1 d 2). Further, up to nine times as much acetaldehyde n be isolated and identified as 2, 4-dinitrophenylydrazone from the expired air of antabuse-treated people as in normal people given the same amount of alcohol under the same conditions (Hald and Jacobsen 1948).

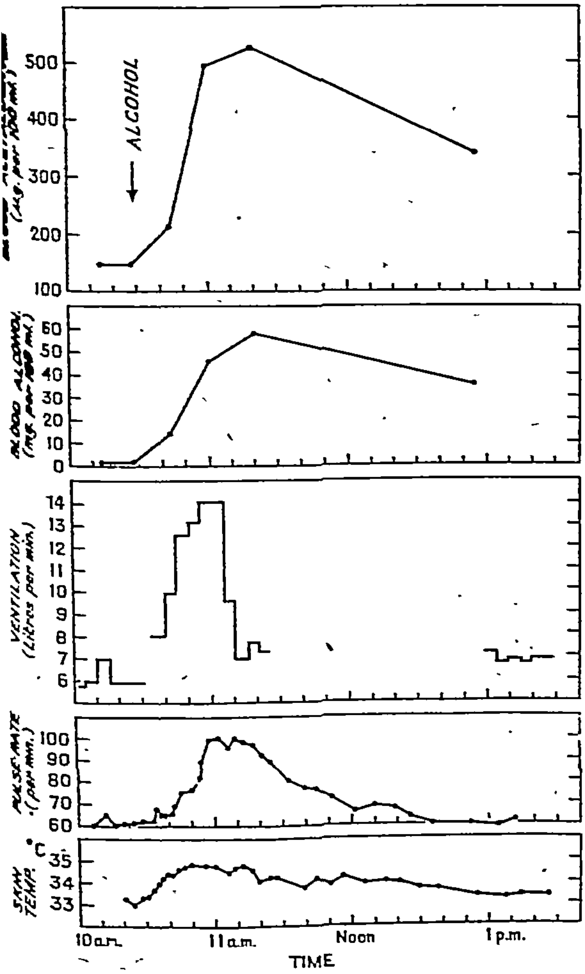

Fig. 2—Effect of 40 ml. of gin on ventilation, pulse-rate, skin temperature of face, blood alcohol, and blood acetaldehyde in a person who had taken tetraethylthiuramdisulphide 1·5 g. the previous day.

Handovsky (1934) has shown that acetaldehyde increases the ventilation and heart-rate, but it is not known at what blood-acetaldehyde levels these effects appear; nor do the few published reports on the pharmacology of acetaldehyde describe its effect on the peripheral vessels in man. By means of continued intravenous infusion of acetaldehyde Asmussen et al. (1948b) have shown that at blood-acetaldehyde levels corresponding to those found in antabuse-treated people after taking alcohol the same qualitative and quantitative effects are elicited: flushing of the face and upper part of the chest, increased ventilation, reduced alveolar carbon dioxide, raised pulse-rate, and an increased dead space (fig. 3). Even in rabbits Larsen (1948) observed increased ventilation at blood-acetaldehyde levels corresponding to those found in antabuse-treated animals given alcohol. Acetaldehyde accumulates very rapidly after the intake of alcohol in antabuse-prepared animals; within 3 min. after the intravenous administration of alcohol to antabuse-treated rabbits a considerable increase in blood-acetaldehyde was noted.

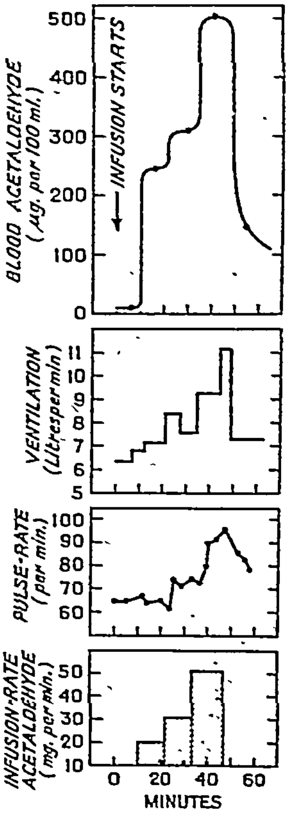

Fig. 3—Effect of acetaldehyde on ventilation and pulse-rate in a normal person.

It is difficult to explain why antabuse causes acetaldehyde to be formed in higher concentrations than normal after the ingestion of alcohol. The elimination-rate of alcohol as measured by blood-alcohol levels was the same in normal people and in people treated with antabuse. In rabbits also no difference between the two groups was observed. Our experiments show that acetaldehyde is eliminated at the same very rapid rate regardless of whether the animals have been treated with antabuse or not. This observation accords well with the fact that the blood-acetaldehyde level is not raised in antabuse-treated animals before the administration of alcohol.

It must then be supposed that only part of the alcohol consumed passes, during oxidation, through the intermediate stage of acetaldehyde. In-vitro experiments made by Lutwak-Mann (1938) support this suggestion. Perhaps after treatment with antabuse, the normal elimination of alcohol is partly or completely blocked, and under the influence of the alcohol dehydrogenase a higher proportion of alcohol than normal is oxidised to acetaldehyde. Another possible explanation is that the alcohol hydrogenase is highly activated by antabuse, but further experiments are needed to solve this problem.

SUMMARY

The organism is sensitised to alcohol after intake of tetraethylthiuramdisulphide (antabuse).

Alcohol given to persons previously treated with this otherwise innocuous substance produces dilatation of hours, generally leaving the person rather sleepy. After the alcohol has been oxidised, the person feels completely well again, and all complaints are usually relieved by a short nap.

Similar symptoms follow the intake of alcohol combined with some other drugs, the best known of which is cyanamide (Koelsch 1914, Mellinghoff and Thomas 1939, Gärtner 1930, 1944, Thiery 1942). Ingestion of the fungus *Coprinus atramentarius* in combination with alcohol gives rise to similar symptoms (Fischer 1945). In rare cases of idiosyncrasy to alcohol similar symptoms appear without any other drug being taken.

In collaboration with Dr. Valdemar Larsen of these laboratories, and with Dr. Erling Asmussen and Dr. Gunnar Jørgensen of the Laboratory for the Theory of Gymnastics, University of Copenhagen, we have further examined this peculiar effect of diethylthiuramdisulphide (trade name 'Antabuse').

TOXICITY

Tetraethylthiuramdisulphide is relatively non-toxic. The lethal dose in animals is reported to be 3 g. per kg. of body-weight (Henzlet and Irvine 1921). In experiments in our laboratory daily doses of 10 mg. were given to rats, and 60 mg. to rabbits, for more than three months without any notable effect on the blood picture or otherwise. In clinical trials single doses of up to 6 g. and daily doses of 0·25–0·60 g. for several months were given without producing any subjective or objective symptoms apart from those following the ingestion of alcohol.

RESPONSE TO ALCOHOL

Normal people usually show no effect or only slight symptoms after taking 10–20 g. of alcohol—e.g., 30–60 ml. of gin—but, if a person has taken 1·0–1·5 g. of antabuse the previous day, symptoms develop mainly involving the circulatory and respiratory systems. Circulatory effects are the facial vasodilatation already described, pulse-rate raised to 120–140 per min., and a slightly increased cardiac output (figs. 1 and 2). No significant change in blood-pressure has been observed, except for a slight fall in a few instances. Respiratory effects include an increase in the dead space, increased pulmonary ventilation, and a corresponding reduction in alveolar carbon dioxide. The main results are given in the accompanying table (after Asmussen et al. 1948a).

EFFECT OF ALCOHOL IN NORMAL PEOPLE WITH AND WITHOUT PREVIOUS TREATMENT WITH ANTABUSE 1·5 g.

	Before intake of alcohol	½ hr. after intake of 60 ml. of gin (43% by vol.)	
		Not treated with antabuse	Treated with antabuse
Respiratory dead space (ml.)	121[1]	138[2]	154[2]
Ventilation in litres per litre of oxygen consumption	19·1[4]	19·1[3]	23·1[3]
Alveolar CO_2 (%) ..	5·35[1]	5·40[2]	4·42[2]
Oxygen consumption (ml. per min.)	264[4]	270[3]	324[3]
Cardiac output (litres per min.)	6·02[4]	5·76[3]	8·64[3]
Pulse-rate (per min.) ..	65[4]	64[3]	90[3]

1. 13 experiments in 4 persons. 2. 4 experiments in 2 persons.
3. 6 „ „ 4 „ 4. 14 „ „ 4 „

The extent of the vasodilatation can easily be registered objectively by measuring the skin temperature of the face. Within less than 30 min. of taking alcohol this rises to 1°C or less below the body temperature. The magnitude of the increase naturally depends on the skin temperature before the intake of alcohol.

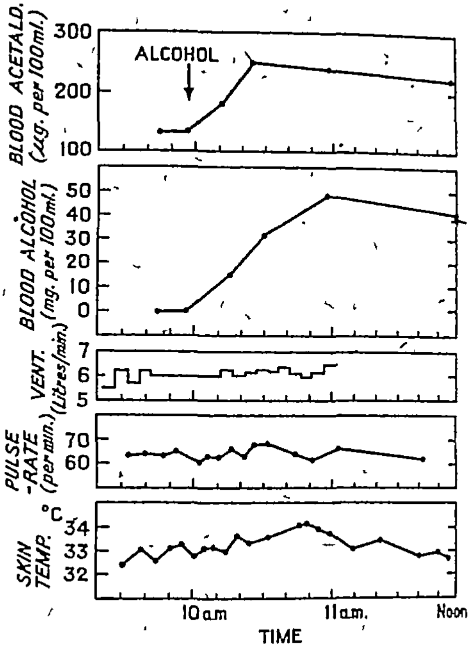

Fig. 1—Effect of 40 ml. of gin on ventilation, pulse-rate, skin temperature of face, blood alcohol and blood acetaldehyde in a normal person.

The effects start 7–12 min. after the ingestion of alcohol and are maximal after about 30 min. (fig. 2). Flushing is the most sensitive symptom and is generally seen with a blood-alcohol level of about 15–20 mg. per 100 ml. The increase in ventilation and pulse-rate is first noted when the blood-alcohol level reaches at least 25–40 mg. per 100 ml. The effects are independent of the route by which the alcohol is given (Hald et al. 1948).

In experiments on animals Larsen (1948) noted no definite effect on blood-pressure, but pulmonary ventilation increased 20–35% after the administration of alcohol to animals previously treated with antabuse, whereas no change was seen in untreated animals given the same dose of alcohol.

The lethal dose of alcohol was determined in mice or rats, and only a slight reduction was seen in groups previously treated with antabuse compared with non-treated animals.

The characteristic effect of alcohol does not appear unless the antabuse is taken at least three hours earlier; in some clinical trials this latent period was as long as forty-eight hours.

ABSORPTION AND EXCRETION

The absorption of antabuse from the gastric intestinal tract is not complete. In man about 20% of a given dose is excreted in the fæces during the following two or three days, and the same tendency is seen in rabbits and dogs. The elimination of antabuse is very slow in man. No antabuse is excreted unaltered in the urine, and after the intake of 1·5–2·0 g. by mouth no increase in the S/N ratio was detected in the urine during the next eight days.

Owing to the slow elimination the effect of a single dose lasts rather a long time. If the increase in skin temperature after the intake of 40 ml. of gin is taken as an indicator, the action of antabuse 0·5 g. lasts three or four days, 1·0 g. five or six days, and 1·5 g. seven or eight days.

No experiments have yet been done to find out if the protracted action is due to slow absorption from the period; but experience has shown that it is fairly easy to judge to which group a given patient belongs, from his psychological history and a comparatively brief observation.

ILLUSTRATIVE CASE-RECORDS

Case 1 (group A).—A woman, aged 43, was an only child of upper middle-class parents; she had been brought up mainly by her mother, who had rather spoilt her. In her youth she showed good faculties but was shallow and lazy. She was always good-natured. After being employed in several different jobs from the age of 19 she married at 25 and had one child. At the age of 13 she underwent an operation for Graves's disease, of which she retained no symptoms.

Her good economic position enabled her to enjoy society life and parties. Her addiction to alcohol developed since 1939 but increased considerably since 1946. At first she took only wine at parties, but later she also drank beer and brandy and continued drinking on returning home. When treatment began she was taking an average of ten drinks a day. In January, 1948, a psychiatrist advised treatment in a clinic for a year, but she refused. Her first interview with me was on Jan. 24, 1948.

On examination nothing remarkable was found. At first the patient refused treatment, saying she did not want to be abstinent for the rest of her life, but finally she was persuaded to try it. She was given antabuse 1 g. and told to drink alcohol the same night. Six hours after taking the antabuse she drank a pint of beer and a glass of rum. She blushed but showed no further symptoms. Two hours later she drank about 2 pints of beer. Shortly afterwards she noted severe blushing of the face and the upper part of the chest, palpitation, and an unpleasant feeling of dyspnœa. A little later, feeling sleepy she went to bed and slept soundly the whole night. She felt perfectly well next morning and continued to take antabuse [illegible]25 g. daily.

At various parties in the next few days she sipped wine but discovered that she had no desire to drink. She blushed after a single mouthful of claret. Her abstinence might be explained by her desire to avoid the humiliation associated with the blushing, but she insists that this is not the deciding factor, and that she has lost the taste for wine and spirits.

In the following month a daily dose of antabuse 0·125 g. was sufficient to make the patient blush after a single glass of wine. She refused a second glass, to avoid the uneasiness she felt the first evening.

On March 1 she attended a dinner party at which several doctors were present. Because she was too shy to reveal her abstinence and wanted to take a couple of drinks without blushing, she was allowed to omit the antabuse for four days before the party. After a single glass of light wine, however, she blushed so much that one of the doctors jokingly asked if she was going to have german measles. The effect faded in half an hour, but she did not take any more drinks that evening.

She now continues to take antabuse 0·0625 g. daily. Occasionally she has two or three drinks at parties with a faint blushing effect, but generally she does not want to drink. On April 8 she and her husband affirmed that she had regained her psychological stability. She has once more become interested in her home and has no inclination to spend too much time at parties. She is in excellent humour, sleeps better than she has for many years, and is willing to continue treatment, though she now finds it unnecessary.

Case 2 (group B).—A man, aged 39, had been a master baker since he was 23. From the age of 25 he began to take alcohol to increase his self-confidence, courage, and energy. He took various types of spirits, even denatured industrial spirit. In 1940 and 1944 he was admitted to an asylum for alcoholics, but for only a few months each time. In 1944 he was treated unsuccessfully with apomorphine. In 1947 a professional hypnotist treated him by suggestion. After this the patient abstained from alcohol for a few months, but later he began drinking as before. In January, 1948, he took about a dozen drinks a day, often starting early in the morning, with the result that his wife had to look after the bakery. His first interview with me was on Jan. 9, 1948.

On examination he was a pale fat pyknic man with characteristic tremor of the hands and he smelt of alcohol. Psychologically he was submissive and aware of his disability. He seemed miserable, tired, depressed, and unreliable, and subconsciously minimised the extent of his alcoholism.

Treatment and Progress.—Treatment was started with antabuse 1 g. followed by 0·5 g. daily. In the ensuing month the patient's reports did not agree with those of his wife, but apparently he still drank though not so much as before, and he developed blushing, dyspnœa, palpitation, &c., after alcohol. He became uneasy and had to rest often, partly because of the alcohol intake, but mainly because of the added effect of antabuse. He also regained sobriety more readily.

After six weeks of this treatment the patient and his wife agreed that his desire for alcohol had disappeared. He became more cheerful, felt well and could do his work again. Taking alcohol, he said, produced colicky pains in his epigastrium, throbbing in his head, and a "hangover" but only for a few hours.

He now takes antabuse 0·125 g. daily. He drinks no alcohol but takes a little more coffee and smokes somewhat more. Emotionally he seems better balanced. He is content with the result of his treatment, and he looks better, and shows no tremor of the hands.

Case 3 (group B).—A man, aged 41, whose father, paternal uncle, and paternal grandfather had probably all been alcoholics, had had an unhappy childhood. His mother died when he was 8 years old, and his father remarried. Relations with his stepmother were not cordial. He was backward at school. He entered his father's house-painting firm and had no other special interests. After his father's retirement he found it difficult to keep the firm on the same level as before. He felt inadequate, and from the age of 28 began to drink increasing quantities of alcohol, until 10–20 drinks a day became normal to him. In 1947 he was sentenced to fourteen days' imprisonment for driving a car while intoxicated. This was probably why he came for medical treatment on Jan. 26, 1948.

Treatment and Progress.—Antabuse was given in the same doses as in case 2. Here also there were discrepancies between the statements of the patient and of his wife during the first weeks of treatment, but since March 1 he has been completely abstinent (with the exception noted below) and continues with 0·125 g. of antabuse a day. He readily takes his medicine and is satisfied with the result.

On April 15 he went to see his dentist and took no tablets that day. Next day he had lunch with a man he had met in jail when they were undergoing sentence for the same offence. The patient thought he ought to take a couple of drinks; and, since he was eager to avoid blushing, he took no tablet that day either. The result was that he suffered only a transient indisposition and continued to drink all day.

Next morning the patient was inclined to continue drinking, as he would have done before treatment, but instead he took 0·5 g. of antabuse and telephoned the doctor. When seen at 2 P.M. he showed the combined effects of alcohol and antabuse: intense blushing, pulse-rate 120 per min., and a feeling of dyspnœa. He was very nervous and eager that the symptoms should develop no further. He said he had taken only one drink on the way to the doctor, and he refused to take another though it was offered by the doctor.

A week later the patient's condition had so improved that he could continue on 0·25 g. of antabuse a day. He has taken no alcohol since. His incipient relapse was thus completely stopped.

COMMENTS

The follow-up is still too short to ascertain how long the results will last, or if any undesirable side-effects will follow the protracted use of antabuse. For this reason caution is advised in treating patients with organic diseases. So far, however, the treatment is promising, especially for the habitual drinker.

Naturally the treatment with antabuse must often be only part of a general treatment. In severe cases psychological analysis and psychotherapy are important, as always in the treatment of alcoholism.

SUMMARY

A treatment for alcoholism is described, based on the sensitisation to alcohol produced by tetraethylthiuram-disulphide (antabuse).

Since December, 1947, 83 patients have been treated, with promising results in 74 cases.

Further observation is required for complete assessment of the results.

the facial vessels, increased pulmonary ventilation, raised pulse-rate, and general uneasiness. The symptoms appear to be the result of an increased formation of acetaldehyde from alcohol.

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TREATMENT OF ALCOHOLISM WITH A SENSITISING DRUG

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HITHERTO treatments for chronic alcoholism have given poor or transient results. The most successful has been psychological treatment, and except for the use of apomorphine in the aversion treatment, no drug has proved at all effective. However, the discovery by Hald and Jacobsen[1] that the intake of tetraethylthiuramdisulphide ('Antabuse') sensitises the organism to even moderate doses of alcohol makes it possible to develop a medical treatment for alcoholism. Concurrently with the examination of the pharmacological effects of this substance I have studied the clinical effects of antabuse on alcoholics. My experiments have now run for about six months and, though this is far too short a time for a full assessment, the results seem promising enough to be worth publishing.

From December, 1947, to May, 1948, 83 patients have been treated with antabuse. So far no harmful systemic effects on liver, heart, kidney, or blood-forming organs have been observed; nor have any untoward side-effects been noted which could be attributed to antabuse.

The general scheme of treatment has been mainly as indicated in the 3 illustrative case-records given below.

After careful physical examination and study of the medical, psychiatric, and social background, the patient is given 1·0–1·5 g. of antabuse and is told to continue with 0·5 g. daily. He is told that he will become ill if he drinks alcohol, and is asked to return for a second interview two or three days later. The patient takes two or three drinks either the night before or immediately before the second interview to show the effect of the treatment. Sometimes the patient will already have taken the alcohol before this time, often in larger amounts than recommended and with a violent reaction, which is beneficial from a therapeutic point of view. A few patients, mostly heavy drinkers, can take considerable amounts of alcohol before the effect appears. In such cases the medication is continued and the patient is tested in the same way at intervals of four to six days. The tolerance for alcohol is, however, gradually reduced.

Thus, for example, after taking antabuse 1·5 g. the previous day and 0·5 g. the same morning, a heavy drinker took nine drinks (under control) during an hour. He blushed and had a raised pulse-rate but nevertheless wanted to continue drinking. Five days later he was tested again and took twenty-six drinks before he had an explosive and copious vomiting. Like all serious cases he was admitted to hospital during the beginning of the treatment. After the second test he was discharged from hospital but continued the treatment. A few days later, after only two drinks, he had to break away from a lunch with his fiancée in a restaurant and take a taxi home. A few days later he became ill even after a single drink.

Such patients are exceptions; most feel so uneasy after four or five drinks taken in one or two hours that they never want to repeat the experience.

When the characteristic effect is observed, the patient is told to continue the treatment and is seen at least once a week at first and at longer intervals later on. It is very important for the patients to keep in contact with the doctor, or for their relations to report to him, so that the effect of treatment can be controlled. In milder cases the patient sees the doctor in his consulting-room, but sometimes it is necessary for the doctor to visit the patient's home.

RESULTS

The patients studied here had sought treatment for alcoholism more or less voluntarily, either at a psychiatric department or as private psychiatric patients. All alcoholics seen since December, 1947, have been given the treatment and are included in this report. They are divided into four groups:

Group A: the 32 patients in this group benefited sufficiently from the treatment to continue on a token dose (often only 0·0625 g. a day) after a few weeks' observation period. Later their treatment was controlled by telephone. These patients can increase their dose when they know they will be tempted to drink.

Group B: the 29 patients in this group see the doctor in his consulting-room at regular intervals and are encouraged to continue the treatment. Their blood and urine are examined, and further dosage is fixed to meet each patient's requirements. The dosage in this group must be sufficient to prevent the patient from taking more than one or two drinks at a time.

Group C: the 13 patients in this group are more psychoneurotic than those in groups A and B and are therefore more difficult to follow. Their desire to be treated is not always genuine, and it often requires an effort on the part of the doctor and the patient's relations to make them continue the treatment. The general impression is that even these difficult subjects have been helped to some degree, but a very long observation time is necessary before definite conclusions can be drawn. No doubt the treatment would be still more effective if legal measures could be taken, but for the present this is impossible in Denmark, in contrast to Sweden and Norway.

Group D: in 9 cases the treatment has failed. Most of these patients have serious psychic defects. All of them have shown the characteristic symptoms after intake of antabuse and alcohol, but they have lacked interest in the treatment and have refused to continue it.

The results are given in the accompanying table. The rather high figure in group C in the first column is due to the fact that the treatment was first tried on a group of psychoneurotic heavy drinkers on whom a series of other treatments had failed. Subsequently a larger less homogeneous group was also treated. It is possible that some of the patients treated for only a short time may be transferred to another group after a longer observation

Group	Duration of treatment			Total
	4–7 months	2–4 months	1–2 months	
A	8	11	13	32
B	6	10	13	29
C	8	1	4	13
D	3	5	1	9
Total	25	27	31	83

For the meaning of the groups see text.

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[1] Hald, J., Jacobsen, E. *Lancet*, Dec. 25, p. 1001.

second aspiration, however, yielded fluid which, though negative on culture, was positive on guineapig inoculation. The temperature subsided completely in twenty days, P.P. was abandoned, progress was uneventful, and the patient was discharged with her tuberculosis quiescent on Aug. 7, 1948.

Case 4.—A girl, aged 17, with moderately severe diabetes, had a left A.P. and adhesion section done at the London Hospital in August and September, 1947, followed by a left spontaneous pneumothorax in October, 1947, and a pleural [illegible] on which contained tubercle bacilli. She was transferred to Black Notley on Feb. 6, 1948, the left A.P. maintained, and with a small tuberculous cavity in her right upper lobe. Pneumoperitoneum was induced on March 15, 1948, with a view to subsequent right phrenic crush (this was not done because of later developments). On April 14, 1948, the patient had a second spontaneous pneumothorax on the left side, followed by the rapid development of a tuberculous empyema, containing tubercle bacilli but not secondarily infected. This was treated by bi-weekly aspirations and washouts with 'Chloramid-T' solution, and almost complete re-expansion was secured.

On May 25, 1948, the patient became febrile (100–101°F), but no cause could be found for this until June 1, when slight shifting dullness in the flanks was detected. A lateral radiogram of the abdomen revealed fluid, but paracentesis abdominis was unsuccessful. Aspiration of the chest yielded a small quantity of clear fluid, which was sterile. The fever mounted to 102°F, and two further attempts at abdominal aspiration were made. The second of these, on June 9, yielded 60 ml. only of fluid which contained tubercle bacilli on direct examination, culture, and guineapig inoculation. High fever continued, reaching 104°F, and great difficulty was experienced with the diabetes, the patient being unable to take food owing to severe nausea and occasional vomiting. By June 30 her general condition was very grave, with toxic myocarditis (confirmed by electrocardiogram), and a course of streptomycin 0·5 g. twice daily was begun.

At laparotomy on July 2 (Mr. R. Reid) 24 oz. of turbid fluid was removed, the peritoneum being bright red and oedematous, with much matting, but no tubercles seen. A fragment of peritoneum revealed miliary tubercles, however, on section. After the operation the patient's condition slowly improved, but up to mid-August she remained seriously ill. The temperature fell to normal for 48 hours, two days after operation, but till mid-October continued as irregular remittent fever between 99° and 101°F. Since then there has been progressive improvement in the patient's general condition, and she is now afebrile and symptomless, though failing to gain weight in spite of adequate calorific intake and control of the diabetes. Streptomycin therapy was discontinued after twenty days, since no benefit was observed, and there has been no regression since its withdrawal. Serial radiography of the lungs has shown no substantial change since May, 1948, and no evidence of miliary tuberculosis.

DISCUSSION

These cases will suffice to show that the development of ascites in the course of artificial pneumoperitoneum may be a grave complication, which should be watched for. I feel that the recognition of a peritoneal effusion should in most cases decide termination of the P.P. The present cases bring out several other points of importance :

(1) A tuberculous ascites may occur in cases in which no evidence of activity of the pulmonary lesion can be found (cases 1, 2, and possibly 3). Two of the worst cases occurred in patients after discharge. This complication differs from the classical form of tuberculous ascites in that adhesive peritonitis develops early, with much matting of intestines and pocketing of fluid. Response to laparotomy is not as favourable as in the classical cases, but the operation may be indicated to remove quantities of fluid and reduce toxæmia. In my limited experience patients stand the operation well. If the process is well developed and associated with continued high fever, the prognosis is poor.

(2) Such a complication has so far not been observed to affect the pulmonary lesion.

(3) Refills should never be given in the presence of an effusion (case 2), and it is very doubtful whether any advantage is gained by giving very large refills (over 800 ml.).

(4) Probably the spontaneous obliteration of a P.P. which is occasionally seen is due to an adhesive peritonitis associated with a small effusion which may not have been recognised clinically.

(5) A high proportion of these effusions contain tubercle bacilli. They were identified in all my cases in which fluid was removed from the abdomen—i.e., in 6 of the 8. The development of tuberculous peritonitis in pulmonary patients with no previous abdominal history, and in whom the pulmonary tuberculosis appeared to be arrested, may be difficult to explain. Peritoneal lesions may be blood-borne from a "quiescent" focus in the lung or elsewhere. The association of these cases with P.P. refills, however, makes it more probable that trauma is a real factor. Whether the refill needle ruptures a tubercle on the parietal peritoneum or the gut, or whether a more generalised trauma is produced which stirs into activity a latent tuberculous lesion somewhere in the abdominal cavity, it is not possible to determine.

However an effusion may be caused, there is no doubt that familiarity must not be allowed to breed contempt, and, though P.P. is relatively benign and harmless, it should be watched and handled with the care that any form of active treatment requires.

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HYPERTROPHY OF THE PYLORUS IN AN ADULT

WITH MASSIVE EOSINOPHIL INFILTRATION AND GIANT-CELL REACTION

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THE possibility that organic changes in the gastro-intestinal tract may be caused by allergic reactions is of great practical importance. The following case is reported because of its rarity and intrinsic interest. We have not been able to discover any published report of a similar case.

CASE-REPORT

A married woman, aged 27, a clerk, was admitted to hospital in February, 1946, with two weeks' history of constant circumumbilical pain intense enough to keep her awake at night, and of pain and a feeling of distension between the breasts immediately after taking food. She had vomited after every meal, and this had relieved the pain between the breasts. She had lost 2 st. in weight. Four years previously she had had a similar but less severe attack associated with melæna, but the symptoms had lasted a fortnight. Her appetite had been good between these two attacks, but eggs, pastry, and bacon caused indigestion. She had never had asthma or urticaria, nor had her father, mother, or two sisters. She denied ever having had syphilis, and the Wassermann reaction was negative.

She had a furred moist tongue and a pulse-rate of 130. There was slight tenderness to palpation in the epigastrium and the right iliac fossa.

Investigations.—With a provisional diagnosis of regional ileitis she was sent for radiography after a barium meal,

PERITONEAL EFFUSION AS A COMPLICATION OF ARTIFICIAL PNEUMOPERITONEUM

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ARTIFICIAL pneumoperitoneum (P.P.) now holds an established place in the treatment of pulmonary tuberculosis. One of its important features is its relative freedom from complications: it may suffer from being, as it were, an indirect means of attack, but it carries less risk than more radical forms of treatment. Of the recorded complications, peritoneal effusion seems to be one of the commonest, and most writers refer to it though few give details or make special comment. In my experience it has occurred in 8 (3·58%) of 223 P.P. cases involving some 5800 refills. This represents only those cases in which fluid was detected, and no doubt the actual incidence is higher, since small quantities of free fluid in the peritoneal cavity are difficult or impossible to recognise. The incidence of detected effusions is low compared, for example, to that of pleural effusions in artificial pneumothorax (A.P.), and is not enough to contra-indicate the use of P.P. in suitable cases.

Clifford-Jones and Macdonald (1943) reported 1 case of peritoneal effusion in more than 60 cases of P.P., but Fowler (1941) had an incidence of 3·8% (56 cases).

Reporting 176 cases of P.P., Mallick et al. (1943) mentioned subcutaneous emphysema and shoulder pain as the only complications in their series. They had no cases of peritonitis, which they say is due to incomplete asepsis. They do not refer to peritoneal effusion at all.

Edwards and Logan (1945) described peritoneal effusions in 4 out of 50 cases treated by P.P. One of these had a febrile reaction to each refill, which led to abandonment of the treatment.

A large series of cases (710) was reported by Mitchell et al. (1947), who found peritoneal effusions in 52 patients (7·3%); 24 of these effusions were tuberculous. They pointed out that Ophuls (1926) found that 12% of patients dying of tuberculosis showed at necropsy peritoneal fluid without pneumoperitoneum. This is an interesting observation but does not necessarily bear on cases under treatment with P.P. Advanced cases of pulmonary tuberculosis are commonly complicated by abdominal tuberculosis, and it is probable that peritoneal effusions might also develop in such cases as part of a general anasarca associated with terminal cardiac failure. Mitchell et al. described also 1 case of fatal air-embolism (following a refill into the liver), and 2 cases of peritonitis of mixed infection (1 due to perforated tuberculous ulcer of the ileum).

Calix and Jacobs (1948) refer to the possible and well-recognised complications, and state that a peritoneal effusion develops in about 1% of cases, "occasionally leading to adhesive peritonitis and abandonment of this form of therapy."

I wish here to call attention to the importance of ascites in cases under treatment by P.P., and to a form of ascitic tuberculous peritonitis which differs from the classical tuberculous ascites and is more serious.

ILLUSTRATIVE CASES

Case 1.—A girl, aged 17, was admitted to Black Notley on Aug. 13, 1945, with exudative tuberculosis of both apices and left subapical region. An attempt to induce a left A.P. failed. In October, 1945, the patient developed an acute spread of exudative tuberculosis throughout the left lung, with rapid cavity formation in the mid-zone. The left phrenic nerve was crushed on Nov. 2, 1945, and P.P. was induced on Nov. 12, 1945. There was slow improvement until by August, 1946, the disease appeared to be quiescent. The phrenic nerve was crushed again on Jan. 3, 1946, and the patient was discharged on March 9, 1947, with her pulmonary tuberculosis fully quiescent. Refills were given at a London hospital until the end of April, 1947, when, on returning home after a refill, the patient felt ill and hot, and next day had rigors.

She was readmitted on May 2, 1947, very ill, flushed, toxic, and with a furred tongue and signs of peritoneal effusion: temperature 103°F, pulse-rate 120–140. $2\frac{1}{2}$ pints of green slightly turbid fluid were aspirated. This fluid contained 55% lymphocytes, and gave a profuse growth of *Micrococcus tetragenus*, but no tubercle bacilli were seen on direct examination or culture. Radiography of the chest showed small areas of linear scarring in the left lung but no evidence of reactivation. The patient remained very ill, with persistent vomiting, and a further $1\frac{1}{2}$ pints of (clear) fluid were aspirated from the abdomen on May 5, 1947. This fluid was sterile on ordinary media but contained 80% lymphocytes and showed tubercle bacilli both on direct examination and culture.

The patient appeared to have an ascitic type of tuberculous peritonitis, and laparotomy (Mr. K. Jacobi) on May 14, 1947, revealed adherent loops of small intestine, with free fluid and fibrinous strands. The peritoneum was œdematous, friable, and hæmorrhagic. No tubercles were seen, and the uterus and appendages felt normal. Hectic fever to 102°F continued, uninfluenced by laparotomy, and after a transient improvement in the general condition, the wound broke down, a fæcal fistula developed, and the patient rapidly went downhill and died on July 2, 1947. No evidence of reactivation of the pulmonary disease was found at any time.

Case 2.—A married woman, aged 33, underwent, at Black Notley, P.P. on July 24, 1946, and left phrenic crush on Sept. 2, 1946, for fibrocaseous tuberculosis. She discharged herself on Sept. 28, 1946, improved and symptomless, but with her pulmonary disease not fully quiescent. She attended a London chest hospital as an outpatient for refills and kept well until May, 1947, when she noticed swelling of her abdomen after larger P.P. refills (1500–1600 ml.).

Outpatient refills were continued until July, 1947, when she was readmitted to Black Notley. She was then afebrile but looked thin and ill and had a large peritoneal effusion. 6 pints of clear yellow fluid were aspirated on July 18, 1947, and $1\frac{3}{4}$ pints on July 22, 1947. The patient had no chest symptoms, and radiography showed tuberculous scarring in both lungs but no evidence of activity. No further refills were given, but 8 pints of fluid were aspirated on Sept. 11, 1947, and $3\frac{1}{2}$ pints on Oct. 4, 1947. All these fluids showed a few lymphocytes only, and that aspirated on Sept. 11 gave a growth of *Mycobacterium tuberculosis* on culture and was positive on guineapig inoculation. No mass could be felt in the abdomen, and the patient was regarded as a case of tuberculous peritonitis of the classical ascitic type.

Laparotomy (Mr. R. Reid) on Oct. 24, 1947, showed the great omentum and intestines matted together with clotted lymph, and about a further pint of greenish opalescent fluid. No definite tubercles were seen, and the adhesions were not disturbed. No tubo-ovarian masses were felt. Convalescence was uneventful except for occasional brief attacks of vomiting and mild generalised abdominal pain. $3\frac{1}{2}$ pints of fluid were aspirated on Dec. 6, 1947, and grew tubercle bacilli on culture. No further aspirations were required, and the patient was discharged symptomless on April 16, 1948. The chest condition remained quiescent throughout.

Case 3.—A girl, aged 18, was admitted to Black Notley on Nov. 4, 1947, with exudative tuberculosis of the left upper lobe. An attempt to induce a left A.P. failed. In February, 1948, she became sputum-positive for the first time, and a small cavity appeared in the left subapical region. Pneumoperitoneum was induced on Feb. 24, 1948, and the left phrenic nerve was crushed on March 15, 1948. Moderate elevation ($2\frac{1}{2}$ in.) of the diaphragm was secured, the patient became sputum-negative, and the cavity closed, but subdiaphragmatic peritoneal adhesions were noted on the left side.

On April 20, 1948, the patient complained of a bruised feeling in the abdomen and of transient diarrhœa, and shifting dullness was found in the flanks. Refills were suspended, and two days later an irregular fever, up to 102°F, began. An abdominal radiogram taken in the lateral position showed a fluid level about half-way up the abdomen, and a small quantity of clear green fluid was aspirated on April 26, 1948. Further aspiration on May 6, 1948, yielded 10 oz. only of clear green fluid with some difficulty, and there was thought to be pocketing of the fluid with matting of the intestines. The cells in the first fluid were about 50% lymphocytes, but no tubercle bacilli were found on direct examination or culture.

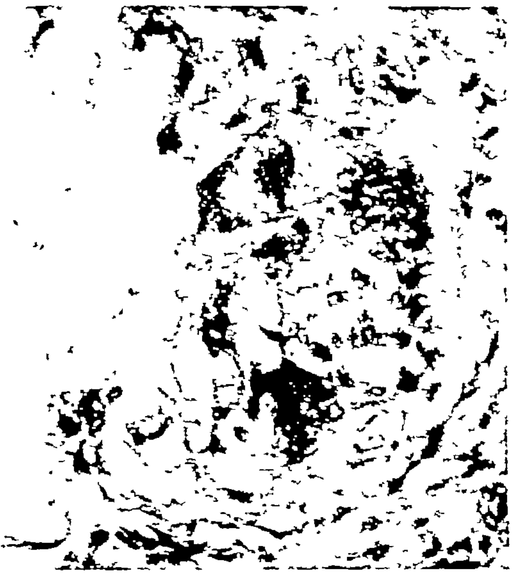

Fig. 3—Central follicle of those shown in fig. 2. (× 325.)

An unusual lesion was the lake of fluid in the prepyloric submucosa.

It is commonly accepted that localised eosinophilia is a relatively sure sign of an allergic reaction (Berger and Lang 1931, Knott and Bruce Pearson 1934), and that the eosinophils come from the blood and are not produced locally (Biggart 1932).

Pararterial Giant-cell Follicles

We have not met with follicles quite like this before. They were quite unlike tubercles, sarcoid, or the follicles of regional ileitis. They might possibly have been a reaction to a foreign body, and it was difficult to assess this possibility, for in repeated blocks no further follicles were discovered, and few sections were available from the original block in which they were found. One of these was stained with Weigert's elastin stain, but no elastic fibres were seen in the giant-cells. Frozen sections were not available. We considered the possibility that the follicles might represent a focus of early fibrinoid degeneration of allergic type, such as those described by Bergstrand (1946), with superadded peripheral giant-cell reaction, but in our experience of these focal degenerative lesions the argyrophilia of the collagen fibres is quickly lost as degeneration proceeds, and only exists as a marginal zone between the central area of necrosis and the surrounding collagen. In the follicles of this case the central zone was strongly argyrophilic and, moreover, was not fibrillar.

An interesting clue was discovered in a description by Šikl (1936) of four cases of eosinophil myocarditis developing after neoarsphenamine treatment of syphilis. The lesions, as described and illustrated, closely resemble those found in the pylorus of our case, but focal necroses were also present resembling those found in rheumatic fever. Šikl accepted the explanation of an allergic inflammation for his cases.

Kaijser (1937) described three cases to illustrate the importance to the surgeon of allergic affections of the alimentary tract.

The first was in a woman, aged 38, who had shown signs of skin sensitivity to arsphenamine when being treated for syphilis. A later course of neoarsphenamine was followed in ten days by severe colic, vomiting, and meteorism. At laparotomy a clear peritoneal effusion was found, and a segment of small gut 0·5 m. long was red, swollen, and œdematous.

The second case was in a man, aged 58, treated with neoarsphenamine for dementia paralytica. Nineteen days after beginning treatment he had severe nausea, pain, and vomiting. At laparotomy there was a peritoneal effusion and 190 cm. of the small gut was friable and swollen and was resected. Microscopy of the intestine showed numerous inflammatory cells, including eosinophils, throughout all coats.

The third case was in a man, aged 53, whose family had allergic manifestations, and who had pain and vomiting after eating onions. Nine days after gastrectomy for an ulcer 26% of his white cells were eosinophils. The stomach showed severe distal œdema with great swelling of the submucosa and widespread infiltration of plasma cells and eosinophils in the mucosa and submucosa.

These cases have been cited in some detail because we believe that they, together with Šikl's cases, are of importance in assessing the significance of ours. Kaijser pointed out that in his case 2, where eosinophil infiltration was mainly in the muscle, the "antigen" was parenteral whereas in his case 3, where the infiltration was mainly mucosal and submucosal, the "antigen" was presumably peroral.

Hypertrophy of the Pylorus

The commonest type of hypertrophy of the pylorus in adults affects the ring unevenly and is secondary to ulceration of the canal or the duodenum. The antrum may be hypertrophied owing to pyloric stenosis, but the duodenum is rarely affected. The even concentric hypertrophy found in our case was an instance of the "idiopathic" hypertrophy of the pylorus found in adults. This condition has been discussed fully by Klose and Bernstein (1932), who claim that the age-incidence (40–50) and the freedom of the subjects from symptoms in earlier years make it likely that it is not a missed congenital pyloric hypertrophy but a new development. Little is known about the causes of either the infantile or the adult form of this disorder; and, as might be expected, it has been suggested that they might be allergic responses. Pylorospasm due to food allergy in infants, simulating pyloric stenosis, has been described by Cohen and Breitbart (1929) and Balyeat and Pounders (1933).

SUMMARY AND CONCLUSION

The case is reported of a woman, aged 27, who developed pyloric obstruction, for which partial gastrectomy was performed.

The surgical specimen showed concentric hypertrophy of the muscular coat of the stomach, pylorus, and duodenum, with massive eosinophil infiltration of the pylorus and peculiar pararterial giant-cell follicles.

The evidence suggests that this is an example of a true organic intestinal allergic reaction. The woman did not tolerate certain foods well; she had constant blood eosinophilia and a localised tissue eosinophilia of the pylorus; and there were giant-cell follicles in the pylorus which closely resembled follicles found in the heart muscle of patients who have become sensitive to neoarsphenamine.

The microscopic sections were prepared by Mr. D. Bradey, and the photographs taken by Miss J. G. Brown.

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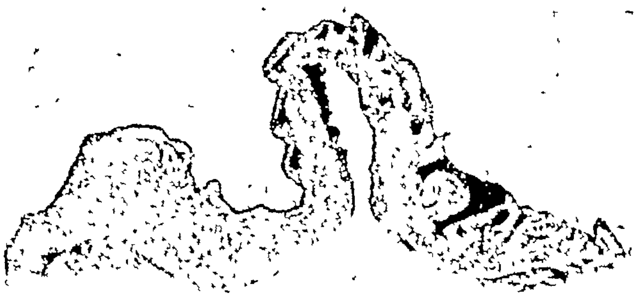

Fig. 1—Macroscopical section of resected part of stomach, showing great muscular hypertrophy.

Dr. J. L. Grout reported that the œsophagus was normal; there was a smooth filling defect involving the greater curvature of the prepylorus; the mucosal pattern was well formed in this narrowed portion of the stomach. Examination in the supine position showed that the filling defect was well defined, with a smooth convex outline. Six hours after the meal there was a small residue in the stomach, but the cæcum and ascending colon had filled. These appearances suggested that there was probably a hypertrophy of the prepylorus, but no malignant growth.

A blood-count showed Hb 120%, red cells 6,300,000 per c.mm., colour-index 1, white cells 17,000 per c.mm. (polymorphs 55%, lymphocytes 25%, monocytes 2%, eosinophils 18%). The only abnormality of the urine was a very faint cloud of albumin. The test for occult blood in the fæces was negative, and repeated microscopy of the fæces did not show any ova.

Course.—The patient remained afebrile but very ill and could not retain her food. Three weeks after admission the white-cell count was 11,800 per c.mm. (polymorphs 16%, lymphocytes 52%, monocytes 1%, eosinophils 31%).

Operation.—Laparotomy showed the pylorus to be greatly thickened. The serosa was reddened, and the whole wall of the duodenum and first 2 ft. of the jejunum were thickened, indurated, and friable. The spleen felt normal. Partial gastrectomy was performed, followed by anterior gastrojejunostomy and enteral anastomosis. Difficulty was experienced in invaginating the duodenal stump, owing to its friability.

Progress.—The patient progressed well and was discharged after a month. The leucocytosis and blood eosinophilia persisted. In November, 1946, she reported that she was two months pregnant. At that time a sternal puncture was normal, apart from a relative increase in neutrophils and eosinophils, and Casoni's skin test for hydatid disease was negative. Radiography of the chest showed no disease. The patient had a normal delivery in May, 1947, and has been well since.

SPECIMEN REMOVED AT OPERATION

Naked-eye.—The specimen is a portion of stomach, lesser curve 6 cm. long, greater curve 13 cm. long, with pyloric canal and an incomplete cuff of duodenum up to 2 cm. long. There is no visible abnormality of the mucosa, but there is translucent grey very wet thickening of the antral submucosa. The stomach wall is very rigid owing to great thickening of the muscular coat, which is 0·2 cm. thick at the proximal line of section, 0·8 cm. thick at a point midway along the lesser curve, 1·2 cm. thick in the antrum, and 1·8 cm. thick at the pyloric sphincter (fig. 1). At the pyloroduodenal junction the thickening rapidly diminishes, but there is some hypertrophy of the duodenal muscular coat which is 0·3 cm. thick at the most distal line of section.

The serosa is smooth but appears thickened over the antrum and pylorus, where it is firmly anchored to the muscle coat by pale striæ traversing the muscle-fibres. These striæ are most obvious on the cut surface of the pylorus, where they form laminæ enclosing big bundles of muscle-fibres.

There are a few pinkish nodes up to 1 cm. diameter near the pylorus, and a few small dark-red nodes along the lesser curve.

Microscopical.—Sections confirm that the thickening of the gut wall is largely due to hypertrophy of the muscle. Even the pale striæ, which give a pattern to the pylorus, are composed of muscle-fibres extending in unusual fashion to the serosa. There is a little increase of fibrous tissue round the blood-vessels and in the duodenal submucosa. The periarterial connective tissue of the muscle coat is infiltrated by broad bands of eosinophils, and there are scattered eosinophils between the muscle-fibres. The thickest band of eosinophils lies deep in the submucosa of the pyloric canal. Eosinophils are rare in the mucosa of the duodenum and pyloric canal and absent from the gastric mucosa and submucosa.

The submucosa of the prepylorus is greatly widened by a lake of lightly eosinophilic material apparently precipitated from a fluid exudate.

The intestinal mucosa is intact except in the pyloric canal, where there is surface erosion, and under the high power the remaining glands show the pleomorphism, distortion, hyperchromatism, and abundant mitoses common to regenerating epithelium. Deep in the bulk of the hypertrophied muscle of the pylorus are three follicles lying in a row in the connective tissue beside an artery (figs. 2 and 3). The follicles are graded in size but of uniform construction and consist of three zones. The central zone is composed of strongly eosinophilic necrotic material of uneven composition showing partly fragmented basophilic remnants of cell nuclei. The intermediate zone is composed of radially arranged giant-cells, partially separated from each other by big vacuoles spanned by interconnecting bridges of cytoplasm. The outer zone is narrow and composed of circumferentially arranged epithelioid cells.

Sections stained by Foot's modification of Perdrau's reticulin stain show that the centre of the follicle is strongly argyrophilic. There are no argyrophilic foci in any of the bands of connective tissue throughout the section to suggest early fibrinoid degeneration.

Many of the arteries running through the mass of hypertrophied muscle are hypertrophied, the muscle cells being swollen, vesiculated, and arranged in columns at right angles to the lumen. The nuclei of the endothelium are swollen, and the lumen contains plasma only. The nerve-fibres and ganglion cells appear normal.

DISCUSSION

Three findings in this case merit discussion: the massive eosinophil infiltration of the pylorus, the pararterial giant-cell follicles, and the hypertrophy of the muscle coat of stomach, pylorus, and duodenum.

Massive Eosinophil Infiltration

Eosinophils are commonly found in the intestinal tract in chronic inflammations and are then most numerous in the mucosa. In our case the eosinophil infiltration was very different. The cells were rare in the mucosa but lay in broad bands between the muscle-fibres. Plasma-cell infiltration and fibrosis, the usual concomitants of inflammation, were almost absent, and

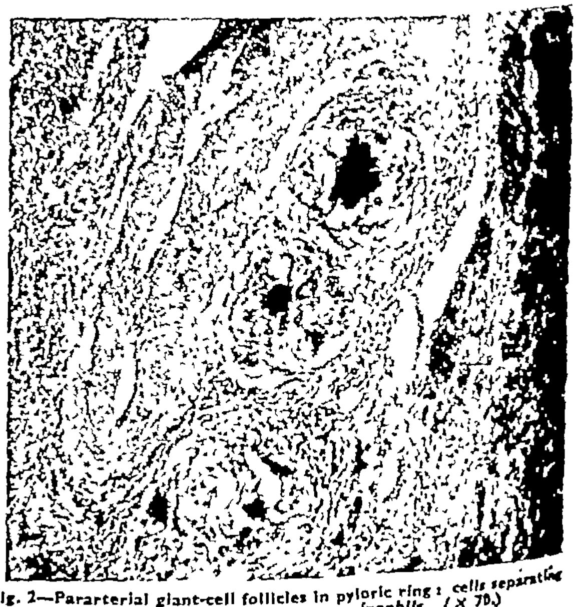

Fig. 2—Pararterial giant-cell follicles in pyloric ring: cells separating surrounding muscle-fibres are eosinophils. (× 70.)

the series on tablets, whether there was toxæmia or not. After cessation of treatment the volume of the packed red cells tended to increase. There was an increase in the volume in 5 of the 10 lupus cases treated by injections.

Serum-calcium.—The normal level varies from 9 to 11·5 mg. per 100 ml.) There was a remarkable difference between the amount of serum-calcium in the two sets of patients. The level rose in every patient on calciferol tablets in each course of treatment. There can be no doubt that the rise was due to the tablets, since the serum-calcium level invariably fell rapidly on cessation or reduction in the number of the tablets. It is essential that the serum-calcium level of all patients receiving massive doses of calciferol in tablet form for any length of time should be estimated at least every four weeks, because, though toxic symptoms coincide in every case with a raised serum-calcium level (over 11·5 mg. per 100 ml.), there are cases in which a raised serum-calcium level is not associated with toxic symptoms. The highest serum-calcium levels reached in the 10 lupus patients who were never toxic on tablets were as follows: 11·6, 11·9, 12·2, 12·3, 12·5, 12·6 (2 cases), 12·7, 12·9, and 14·4 mg. per 100 ml. Many patients are slow to recognise symptoms: thus a patient with a serum-calcium level of 15 mg. per 100 ml. had excessive thirst and polyuria which she entirely omitted to mention.

The essential feature of injection therapy is that there is little or no hypercalcæmia. The highest level reached was 12·2 mg. per 100 ml. by 2 patients on two occasions. This feature is emphasised by the fact that 1 patient, whose serum-calcium level repeatedly rose to 14 mg. per 100 ml. after four weeks on tablets, had a normal serum-calcium level while on injections, and 2 others, whose serum-calcium levels were 14·2 and 13·8 mg. per 100 ml. while on tablets, were normal throughout while on injections.

Toxicity.—Here again there was a remarkable difference between the two sets of patients. Of the 32 patients treated with calciferol tablets 22 had symptoms of intolerance. These varied from patient to patient. The commonest were loss of appetite, gastric discomfort, a feeling of weight or tightness over the abdomen and chest, headaches, dizziness, depression, extreme lassitude, nausea, vomiting, frequency of micturition, polyuria, excessive thirst, neuritis, palpitation, rheumatic pains, and breathlessness. In all cases the toxic symptoms coincided with a rise in the serum-calcium level, each patient having a certain level above which he or she exhibited symptoms of intolerance. These levels were as follows: 11·6, 12 (4 cases), 12·2, 12·3 (2 cases), 12·6 (3 cases), 12·7, 12·8, 12·9, 13 (2 cases), 13·1, 13·2, 13·7 (2 cases), 13·9, and 14·6 mg. per 100 ml. of serum.

Toxicity did not hinder cure, for 17 of the 22 patients who were toxic on tablets were cured clinically, and 4 of the 10 cases who were never toxic were cured.

None of the 10 lupus patients treated by intramuscular injections developed toxic symptoms. This was most remarkable in the 4 patients who had previously been treated with tablets. One of these had vomited so much during his first week of treatment with 3 tablets (150,000 I.U.) daily that he could never take more than 2 tablets daily—i.e., 700,000 I.U. weekly—yet on injections he had no symptoms of intolerance though he had three injections of 600,000 I.U.—i.e., 1,800,000 I.U. weekly—for the first three weeks and two injections of 600,000 I.U.—1,200,000 I.U. weekly—for the remainder of his course. Two of the other patients vomited so much on tablets that it had to be left to their own discretion to take what they could. However, on injections with a larger dose than they had ever attempted to take in tablet form they felt quite well.

Only twice during treatment by injection was there any semblance of toxic symptoms.

One patient after having injections for four months complained of headaches on returning home after her injections. Injections were stopped for a week, and the headaches ceased. She had no return of the headaches until two months later, when she complained of aching pain over the occipital region and at the nape of the neck. Treatment was discontinued for three months.

Another patient after having injections for seven months reported that on one occasion only she had the same feeling of nausea as when she was beginning to be toxic on tablets. Injections were stopped for a week, and she had no return of the nausea.

Serum-inorganic Phosphates.—(The normal level is 2–4 mg. per 100 ml. of serum.) There was no apparent relation between the amount of calcium and the amount of inorganic phosphates in the serum. The inorganic phosphates rose above the original level at some time during each course of treatment on tablets for every patient. Unlike the serum-calcium level, which fell in every case when calciferol was stopped or reduced in amount, the level of inorganic phosphates rose in some cases and fell in others after cessation of treatment.

The toxic symptoms do not appear to depend on the amount of inorganic phosphates in the serum. Some patients were toxic when this was as low as 2·4 mg. per 100 ml. (the serum-calcium level being raised); others were toxic when it was as high as 6·2 mg. per 100 ml. (the serum-calcium level being high); and others were not toxic when it was either 2·4 or 6 mg. and 2·8 or 5·6 mg. per 100 ml. of serum (the serum-calcium level being normal).

With injections also the inorganic phosphates rose above the original level for every patient some time during treatment.

These remarks also apply to the controls.

Blood-urea.—(The normal level is 20–40 mg. per 100 ml.). The blood-urea was raised by treatment in 12 of the 32 lupus patients who completed the whole course of treatment on tablets. It rose in 1 case to 56, in 1 to 51, in 1 to 47, in 3 to 45, in 3 to 44, in 2 to 43, and in 1 to 42 mg. per 100 ml. Of these 12 patients, 7 had toxic symptoms either at the time or just previously, and those 7 all had hypercalcæmia; 5 only showed hyperphosphatæmia (3 of these were included in the 7 with hypercalcæmia and toxæmia). The blood-urea level of 1 of the psoriasis patients rose to 45 mg. per 100 ml. and that of the normal control to 41 mg. per 100 ml. without hyperphosphatæmia, hypercalcæmia, or toxic symptoms.

The blood-urea level was raised in 2 of the 10 lupus patients receiving calciferol by injection; neither of these patients had toxic symptoms or hypercalcæmia, but both had a raised serum-inorganic phosphate level. The blood-urea was raised in these 2 cases to 47 and 69 mg. per 100 ml.

Urea Clearance.—This was not estimated for the patients on tablets at the start of treatment, so their normal kidney function was not known. It was first estimated before starting the second course of treatment. Comparison of the figures then obtained with those at the end of treatment showed that after treatment the kidney function was greatly diminished for all cases except 1 case of lupus verrucosus and 1 lupus patient who had been very toxic at the end of the first course of treatment and had a raised blood-urea level and diminished kidney function at the beginning of the second course. The kidney function was also greatly diminished for all the controls. In 18 of the lupus patients and 3 of the controls the kidney function slightly improved after the patients had been off tablets for four weeks. For the patients on calciferol by injection the kidney function was diminished in all cases except the patient with Bazin's disease and the psoriasis control, both of whom had been on treatment for only four months.

Radiography showed calcification of the iliac arteries in 2 cases of lupus vulgaris on calciferol tablets, both of whom had had hypercalcæmia. This disappeared shortly after the cessation of treatment.

Alkaline Phosphatase.—This increases when bone is being formed or rapidly destroyed and should be normal

CALCIFEROL BY INTRAMUSCULAR INJECTION

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ONE of the greatest advances in dermatology in recent years has been the cure of lupus vulgaris with massive doses of calciferol (vitamin D_2). With this drug alone, without any local treatment, patients can be cured in a comparatively short time. It has, however, two serious disadvantages: it is badly tolerated by many patients; and it is dangerous because it can damage both blood-vessels and kidneys. For this reason all patients treated with calciferol should have serum-calcium estimations and kidney-function tests at regular intervals.

Since April, 1946, all tuberculous skin patients attending the lupus clinic at Belmont Road Hospital, Liverpool, have been treated with calciferol. For a proportion of these cases regular investigations were done, as follows:

(1) At the beginning of treatment, every fourth week during treatment, and the fourth week after all treatment had ceased, estimations were made of the erythrocyte-sedimentation rate (E.S.R.), by Wintrobe's method, the volume of packed red cells, the serum-calcium, the serum-inorganic phosphates, and the total and differential white-cell counts. The white-cell counts were discontinued after November, 1946.

(2) Weekly examination of the urine for calcium with Sulkowitch's reagent and occasionally a routine examination of the urine.

(3) Weekly record of weight.

(4) Weekly record of clinical progress and of toxic symptoms, if any.

(5) Record of blood-pressure at intervals.

(6) Urea-clearance test at the end of each course of treatment and four weeks after all treatment had ceased. In the case of patients on injections this was also done before treatment began.

(7) Lateral and anteroposterior radiograms of abdomen and lateral radiogram of one leg, at the end of treatment, to detect abnormal calcification, if any, in kidneys and arteries.

(8) The serum-alkaline phosphatase was estimated at intervals for patients on injections only.

The patients were photographed before and after treatment.

The patients investigated included 39 cases of lupus vulgaris (4 of which were later treated by injections because of toxic symptoms), 2 of lupus verrucosus, 2 of erythema induratum, and 1 of erythema induratum (a tuberculide) with generalised tuberculides. As controls were included 1 normal person, 3 with psoriasis, and 1 with tinea infection of the nails. Of the 39 patients with lupus 3 did not complete the course, 1 having developed kidney disease, 1 having had an amputation of the leg because a large tuberculous ulcer on her foot had undergone a malignant change, and 1 ceasing to attend as soon as he was cured. These 3 are not taken into account in the summary except in the percentage of cures.

TREATMENT

All cases were started on a daily dose of 150,000 I.U. of calciferol in the form of high-potency 'Ostelin' tablets (Glaxo) and were treated for six months. After an interval of twelve weeks a second course of treatment was given lasting five months.

Some patients could not take 150,000 I.U. daily owing to intolerance. For them at first the dose was reduced to 100,000 or 50,000 I.U. daily according to their tolerance, but later it was found more satisfactory to stop the treatment entirely for four weeks and then to resume the full dose of 150,000 I.U. daily.

After calciferol had been given by mouth for a few months, it was thought possible that the nausea and vomiting which seriously interfered with the continuity of treatment might be due to the action of the tablets on the gastric mucosa. To ascertain if this were so, it was decided to begin treatment with intramuscular injections for all new patients after November, 1946. The injections were first tried on 2 of the patients who had experienced extreme nausea and vomiting while on tablets. They were admitted to hospital and kept under strict observation during their first month of treatment. They were given injections of 600,000 I.U. of high-potency ostelin three times a week for the first three weeks, and their blood chemistry was checked weekly. After the first three weeks they were given one injection of 600,000 I.U. weekly, but later this was increased to two injections weekly with better results. The series of patients on intramuscular injections included 4 lupus patients who could not tolerate the tablets, together with 6 new lupus patients, 1 with severe erythema induratum (Bazin's disease), and 1 with psoriasis as a control.

RESULTS

The fact that none of the patients missed his or her tablets or injections speaks for itself. Nowhere could one have found a more cheerful or grateful set of patients. Improvement was seen in the first week of treatment in all except one case, and within a month to six weeks all ulceration had usually healed.

Of the 35 cases of lupus vulgaris treated with calciferol tablets, 22 (63%) were clinically cured, and the average time taken to affect the cures was eleven months. Of the remainder, 1 was 90% healed, 3 were 75% healed, 6 were 50% healed, 2 were 40% healed, and 1 was practically stationary. Of the 2 cases of lupus verrucosus 1 was cured in eleven months; of the 2 cases of erythema induratum 1 was cured in three months and 1 in six months. The case of erythema induratum with tuberculides was unsatisfactory.

Of the 6 cases of lupus treated with injections alone 3 (50%) were clinically cured in an average of four and a half months: 1 in three months, 1 in four months, and 1 in six and a half months. Another was almost cured in seven and a half months. Of the 4 patients who could not tolerate the tablets 2 were cured—1 in four months, and 1 in five months, after the injections were begun.

Pigmentation.—Temporary brownish pigmentation, which was often very unsightly, developed in the lupus areas of almost half the patients on tablets but not in any of the patients on injections.

Blood-pressure did not vary appreciably in any of the patients except in one woman who developed kidney disease, in whom the systolic pressure rose from 140 to 166 mm. Hg.

Weight.—The weight of the patients on tablets, apart from those who had symptoms of intolerance, was slightly increased. Of those on injections half lost and half gained weight.

White-cell Counts.—The differential white-cell counts were so variable that it was obvious after a few months that no useful information could be obtained from them.

Erythrocyte-sedimentation Rate.—At the start of treatment on tablets the E.S.R. was normal in 15 of the 32 lupus cases investigated. Calciferol appeared to have a distinct tendency to raise the E.S.R., for in many cases it rose with treatment and fell during the rest period. There was no correlation between the E.S.R. and clinical cure. For example, of the 17 cases with an abnormal E.S.R. in the beginning, 15 still had a raised E.S.R. at the end of treatment. Of these, 7 were cured clinically, 4 much improved, and 1 stationary. Intolerance to calciferol did not raise the E.S.R. Only 1 of the patients on injections had a normal E.S.R. before treatment started. With injections there was on the whole a tendency for the E.S.R. to rise at first and then to fall gradually, but in some cases the course was erratic. Patients were cured clinically whether the E.S.R. remained high or low or fell.

Volume of Packed Red Cells.—A slight decrease in the red-cell volume was a constant finding in every case of

%) the intensity of the pains was lessened considerably, the patient became coöperative, and cervical dilatation was rapid. In 31 (20·3%) the pains were made more bearable and the patient became coöperative. In 14 (9·1%), though the intensity of the pains was not diminished, in all but 6 cases apprehension was allayed and coöperation achieved.

EFFECT ON BABY

Some degree of asphyxia was seen in 23 babies, of whom 6 (3·9%) were slightly asphyxiated, 8 (5·2%) were in blue asphyxia, and 8 (5·2%) were in white asphyxia. In 6 cases the asphyxia was due to the cord being tight round the neck; in 5 cases to excess of mucus in the air passages, in 1 case to congenital heart disease (proved at necropsy), and in 1 case to prematurity (in twin); leaving 10 (6·5%) cases in which there was no obvious cause of asphyxia. In these 10 cases 1 mother had had one injection (100 mg.), 4 had had two injections, 3 had had *three* injections, and 2 had had *four* injections of pethidine. We may conclude that the total dosage bears no direct relationship to asphyxia in the infant, even if we presuppose that pethidine may be a causal factor. Of the 10 infants 3 had slight asphyxia, 4 had blue asphyxia, and 3 had white asphyxia. All 23 infants except 1 recovered with simple routine treatment.

In 153 unselected deliveries in 1942, when the only "analgesic" in use was potassium bromide, the number of babies born with asphyxia was 13 (8·5%).

In the present series the number of stillbirths was 3 (1·9%). Of these, one was a macerated twin, one was syphilitic, and the third was a shoulder presentation which had undergone combined version.

CONCLUSIONS

Mother.—At least by intramuscular administration the toxic effects of pethidine are slight and infrequent and may be discounted. It is my impression that pethidine hastens dilatation and accelerates delivery. Apart from its analgesic properties, we were struck by the manner in which it allayed apprehension and helped to achieve the patient's coöperation. We have found that, combined with heroin and trilene, it is a most useful and helpful drug during labour.

Baby.—Comparison with the 153 cases in 1942 seems to show an increase in the incidence of asphyxia. This was not unduly high, however, and most of the babies responded quickly to simple treatment.

SUMMARY

The use of pethidine hydrochloride in combination with heroin and trilene is described in 153 successive deliveries. This combination was effective in 70·6% of cases

Apart from being a potent analgesic, pethidine has a striking effect in allaying apprehension and achieving the patient's coöperation.

Though the incidence of fœtal asphyxia was somewhat higher than in a previous year, in which pethidine was not used, this is not a contra-indication to its use.

I am grateful to Dr. S. W. Savage, county medical officer of health, for permission to publish these findings. My sincere thanks are due to the matron, Mrs. M. Middleton, and to our keen and competent staff midwives, Nurses Foley, Mellon, Driscoll, Booden, and Robson, without whose cheerful coöperation and helpful criticism it would have been impossible to keep our records.

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New Inventions

SPLINTAGE OF THE HAND DURING OPERATION

EFFECTIVE fixation of the hand during operations on it is always difficult and often a source of irritation. Many surgeons have an assistant to hold the hand in the required position; some are content to try and control the limb with strips of gauze, towel clips, strapping, &c.; while others use a rigid metal or wooden splint. But such methods do not permit of ready adjustment during operations which are commonly long and tedious and likely to involve alterations in position. At their best they restrict the surgeon's field of operation and tend to block his view.

The splint described here overcomes these disadvantages and is extremely simple. It consists merely of a flat shape cut from a sheet of lead 12 in. by 14 in. and $^1/_{16}$ in. thick (fig. 1). The hand is laid on the splint, which is then accurately moulded round it. The fingers are fixed by bending the tips of the splint over them (fig. 2), or if necessary they can be held straight by making gutters of the metal tongues. The thumb is held by an additional piece at the side. The wrist is bent into the required position, and the side bars are folded obliquely round the forearm.

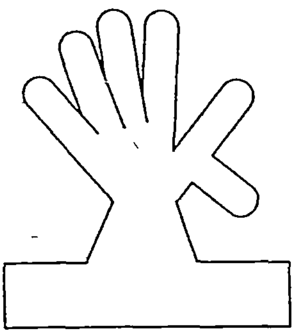

Fig. 1.—Outline of splint cut from sheet lead.

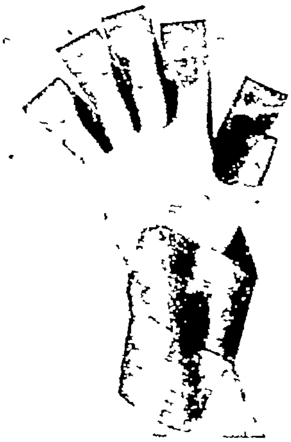

Fig. 2.—The splint applied.

The following advantages are claimed for this form of leaden splint:

(1) It can be quickly and accurately moulded into any position. It may be applied equally well to the back or front of either hand and to a limb of any size. The hand and fingers are firmly held without the use of clips, straps, or retractors. It is particularly useful in operations on the side of the finger, since the other digits can be held effectively out of the way.

(2) Sheet lead of this thickness is sufficiently malleable to be easily bent by hand, and is soft enough not to damage the tissues by pressure or to tear the surgeon's gloves. At the same time it is sufficiently rigid to fix the hand in the position required. If further support is needed, the hand encased in the splint may be rested on a folded towel.

(3) The splint is easily sterilised by boiling and may be applied safely either directly to the hand or over a stockinette glove.

(4) It is quickly and cheaply made, is durable, and can be rapidly bent or hammered flat again after use.

(5) It releases an assistant and affords the surgeon a clearer field of operation.

My thanks are due to Mr. R. G. Pulvertaft, both because his work on the surgery of the hand stimulated me to develop this splint, and for his willingness to try it and later to adopt it as a regular part of his equipment.

GEOFFREY R. FISK
M.B. Lond., F.R.C.S.E.
Cambridge.

in the healthy adult. According to the method of Armstrong and King the normal number of units is 10. This was estimated for patients on injections only. In 3 cases of lupus it was raised to 14, 18, and 25 units, and in the psoriasis control to 25 units at the start of treatment. These figures fell during treatment to 6, 4, 7, and 16 units. Thus the alkaline phosphatase of patients treated with injections of calciferol shows a tendency to become normal.

PROPYLENE-GLYCOL SOLUTION OF CALCIFEROL BY MOUTH

So far I have tried only 2 lupus patients on a propylene-glycol solution of calciferol by mouth. With the same number of units as given to the patients on tablets—i.e., 150,000 I.U. daily—the clinical results were remarkable, but at the end of seven weeks treatment had to be discontinued because of toxic symptoms and hypercalcæmia. One patient had extreme nausea, with serum-calcium 12·8 mg. per 100 ml., and the other had extreme nausea and palpitations, with serum-calcium 14·8 mg. per 100 ml.

ALCOHOLIC SOLUTION OF STEROGYL 15 BY MOUTH

'Sterogyl 15,' an alcoholic solution of calciferol, has been administered to 6 patients in the dosages used by Charpy, but without his special diet. In 2 cases the serum calcium was raised to 13 and 13·3 mg. per 100 ml., and in 1 case the blood urea rose to 56 mg. per 100 ml. Clinical cure was no more rapid than with injections or tablets.

POSTSCRIPT

Of the patients who were still not cured after two courses of calciferol in tablet form, during which they were repeatedly obliged to cease treatment on account of toxicity, 4 have, after another three months' rest, been on intramuscular injections of calciferol for three months.

Case 1, who could take only 3 tablets daily—i.e., 1,050,000 I.U. weekly—for six to eight weeks before becoming toxic, with a blood-calcium level of 14·6 mg. per 100 ml. and over, felt perfectly well on two injections weekly (1,200,000 I.U.), and his serum-calcium level did not exceed 12 mg. per 100 ml.

Case 2, who would take only 3 tablets daily for five to six weeks before becoming toxic, with a blood-calcium level of 13·7 mg. per 100 ml. and over, felt better than usual on two injections weekly, and her serum-calcium level never exceeded 11·3 mg. per 100 ml. She is now clinically cured.

Case 3, who could take only 3 tablets daily for eight weeks before she became toxic, with a blood-calcium level of 13·1 mg. per 100 ml. and over, has felt perfectly well on two injections weekly, and her blood-calcium level has not exceeded 12·2 mg. per 100 ml. On tablets she made no headway, but on injections her lupus is clearing.

Case 4, who could take only 3 tablets daily for six to eight weeks before becoming toxic, with a serum-calcium level of 12·6 mg. per 100 ml. and over, has felt perfectly well on two injections weekly, and his serum-calcium level has not exceeded 11·7 mg. per 100 ml.

SUMMARY

Calciferol by intramuscular injection is a better mode of treatment than calciferol in tablet form for the following reasons: (1) results are more rapid; (2) pigmentation is absent; (3) there are no toxic symptoms and therefore no unavoidable breaks in treatment; (4) there is little or no hypercalcæmia and therefore there is less chance of calcification in soft parts; (5) all patients do not get a diminished packed red-cell volume; and (6) the blood-urea level is raised in a smaller proportion of cases.

Examination of the blood gave no help in diagnosis, prognosis, progress, or cure.

Kidney function is impaired in all cases treated with calciferol, whether by injection or by mouth in tablet form, for a considerable time. For this reason courses of treatment should not last longer than four months without a rest period.

I wish to thank Dr. F. Glyn Hughes, senior dermatologist, Liverpool City Hospitals, for permission to publish the results of these investigations, and Dr. J. Carr Brundret, pathologist, Liverpool City Hospitals, for assistance in laboratory work.

PETHIDINE IN OBSTETRICS

REVIEW OF 153 CASES

PATRICK J. O'REILLY
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ASSISTANT COUNTY M.O.H., WARWICKSHIRE; MEDICAL OFFICER WITH CHARGE, COUNTY MATERNITY HOME, RUGBY

PETHIDINE hydrochloride, now included in the British Pharmacopœia, has an antispasmodic action and relieves pain rapidly without impairing consciousness or coördination. Its constitution and pharmacology have been described by Gallen and Prescott (1944).

Since its introduction in 1939 it has been used in labour both alone (Gilbert and Dixon 1943) and in combination with other analgesics, such as hyoscine (Cripps et al. 1944, Flatt 1946), scopolamine (Schumann 1944, Hingson, 1945), and phenobarbitone (Carter 1945). Most workers agree that the use of pethidine, either by itself or in combination, is a definite step forward.

In February, 1947, pethidine hydrochloride was introduced to the County Maternity Home, Rugby, as a routine analgesic. A careful record was kept of its effect on mother and infant. The results in 153 successive cases are presented here.

My predecessor, Dr. J. L. Farmer, had introduced and used successfully as an analgesic a combination of heroin and 'Trilene.' It was felt that these drugs could be combined successfully with pethidine, and therefore the following method was adopted:

(1) Where necessary primiparæ received a preliminary dose of heroin gr. $^1/_{12}$ on admission. When the os was 3 or 4 fingers dilated, pethidine 100 mg. was given intramuscularly, followed by 100 mg. an hour later and 100 mg. 4-hourly up to a total 24-hour dosage of 400 mg.

(2) After the head was crowned and during its passage over the perineum trilene was self-administered.

(3) In multiparæ the preliminary heroin was rarely found necessary.

In our early days of its usage we got the impression that when pethidine was given too soon it tended to arrest labour.

In all our cases pethidine (Roche) was used. One injection was given in 41 (26·7%) cases; two injections in 77 (50·3%), 1 of which was a forceps delivery; three injections in 24 (15%) cases; four injections in 6 (3·9%) cases, 2 of which were forceps deliveries; and more than four injections in 5 (3·3%) cases, of which 4 were forceps deliveries.

EFFECT ON MOTHER

Toxic symptoms were rare; they consisted chiefly in vertigo and vomiting, and they were transient.

Of the 153 women 100 were primiparæ and 53 multiparæ.

In the primiparæ there were 7 forceps deliveries—5 for disproportion and 2 for fœtal distress. The average duration of labour from the time of the first pethidine injection was 4·02 hours. If we exclude the 7 forceps cases, the average duration of labour was 3·1 hours.

In the multiparæ there were no forceps deliveries. The average duration of labour from the time of the first pethidine injection was 2·3 hours. For the whole series the forceps-rate was about 4·5%.

In 1947 we had two cases of obstetric shock. The first was in a primipara who had had pethidine. It was felt then that the hypotension due to pethidine might have been aggravated by a sudden fall in intra-abdominal tension. However, about five weeks later we had another case in a multipara who had not had pethidine.

The analgesic effect was carefully observed both by the midwives and from the patients' own observations. In 39 (25·5%) the pains were relieved rapidly and in many cases completely, the patient became calm and coöperative, and cervical dilatation was rapid. In 69

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Christmas

"It is now Christmas, and not a cup of drink must pass without a Carol: the beasts, fish, and fowl come to a general execution, and the corn is ground to dust for the bakehouse and the pastry.—Now good cheer and welcome, and God be with you."—NICHOLAS BRETON, 1626.

[illegible] trend of the age is towards uniformity, in people, [illegible]es, and times. The common man has common [illegible]ions; everywhere his towns and homes are losing [illegible] individuality; and the days of the week are [illegible] alike. We no longer wear Sunday clothes, [illegible] we eat sausages and ice-cream throughout the year. Fruit is esteemed more highly for appearing out [illegible] season than for natural flavour. We seem, indeed, [illegible] seek a dead level at which we shall have everything [illegible] all times, and nothing therefore will be worth having. [illegible] all this we depart from the habits of our ancestors, [illegible] life changed so much with the seasons and who [illegible] so conscious of variety within a basic rhythm. [illegible] the countryman, even today, the best weather is [illegible] good weather but seasonable weather: things [illegible]uld happen at their proper times. Likewise from [illegible] antiquity there have been fasts and festivities [illegible] to the times of year; and very long ago our fathers decreed that mid-winter, soon after the [illegible] day, was the proper season for a festival of [illegible] time when families and friends should be gathered before a fire and shout defiance at winter and at fate. Like ourselves they had plenty of cares; but they were perhaps more fully aware of the need to prevent monotony by deliberate changes of mood by feasts as well as fasts. Their festival at mid-winter was already a festival of hope long before it received its new name from the Christian church; but now the hope has a deeper significance through its association with the great idea of good will among men, as children of one father. In 2000 years this idea has lost none of its validity; and its strength, with our own, can be renewed at Christmas.

"In sum, it is a holy time", wrote NICHOLAS BRETON. "I hold it a memory of the Heaven's love and the world's peace, the mirth of the honest and the meeting of the friendly."

Smoke

DEATH from poisoned air has always had peculiarly terrifying associations. Yet over the centuries the thought and fact of atmospheric pollution has been presented so gradually and familiarly that it is hard to persuade the public that poisonous fumes are no less lethal when generated by industry, and no more genial when derived from the family hearth. Not long ago we commented [1] on the disaster at Donora in the United States, where 18 elderly patients died in one day, and 200 people came under treatment, from the effects of smoke and fog which had been kept at low levels by an accident of weather. It true. that the fog at Donora probably had a hig concentration of exceptionally poisonous fumes from a zinc-smelting plant; but ordinary fog, such as w have lately experienced, is well enough laden wit milder poisons; and every year, in cold foggy weather many elderly people die before they need—just a surely as the Donora victims, if less spectacularly If it is hard to assess the harm that atmospheri pollution does to health, it was no doubt equall hard, in the old days, to assess the harm done b defective sanitation. The results of cleansing th air might be little less remarkable than those o cleansing the water.

Bituminous coal, the common domestic an industrial fuel of Great Britain, throws into ou atmosphere every year about 3 million tons of soli matter—as tar and oil particles, and soot—togethe with 5 million tons of sulphur dioxide and variou other products of partial combustion includin methane and carbon monoxide. Mr. ARNOLD MARSH general secretary of the National Smoke Abatemen Society,[3] has estimated the direct annual cost o smoke—in cleaning of buildings, repairs to masonry laundry, replacement of plants in parks and open spaces, waste of fuel by imperfect combustion, extr lighting, and so on—at £100 million a year. Th remedies are expensive, too, since they mean much new equipment, and giving up bituminous coal i favour of smokeless fuels, some of which are dearer t buy, though they may be more economical in th long run; but Mr. MARSH believes that the cost o the remedies could not approach the cost of smoke Half the money nowadays wasted in ten years would suffice to convert all domestic grates to types which would produce virtually no smoke; and domesti grates are responsible for half the smoke in ou atmosphere. It is good news, therefore, that th Ministry of Health has now forbidden local authoritie to install outmoded grates and stoves in their new houses.[4] In future, grates must be chosen from among varieties approved by the Government a efficient—of which there are no fewer than 69, the simpler ones costing about £5. Even bituminous coal, if fully combusted, does not pollute the atmosphere; but it is unlikely that we shall ever be able to burn it completely in domestic appliances, and certainly we shall not be able to do so in open fires The conscientious householder who does not wish, or cannot afford, to replace all his grates is therefore in a dilemma: his grates will not burn the natural smokeless coals, such as anthracite and Welsh steam coal, which incidentally are more expensive than ordinary coal; and though he may be prepared to use the low-temperature smokeless fuels, such as gas coke and 'Coalite,' he will probably not be able to buy them in sufficient quantity, though they will burn in most types of grate. He is thus apt to forget his conscience, buy a few logs to eke out his coal ration, and wish the legislators would begin by reducing the smoke from the factory next door. Alternatively he may rely on gas and electricity—regardless of the fact that the Simon Committee in 1946 reported that these were twice as expensive as

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[1] *Lancet*, Nov. 6, p. 738.

[2] Smoke: the Problem of Coal and the Atmosphere. London, 1947.

[3] Chandos House, Buckingham Gate, Westminster, S.W.1.

[4] *Times*, Nov. 22.

Reviews of Books

The Basis of Chemotherapy

T. S. WORK, B.SC., PH.D., a member of the research staff, National Institute for Medical Research, London; ELIZABETH WORK, B.A., PH.D., a member of the research staff, University College Hospital medical school, London. Edinburgh: Oliver & Boyd. 1948. Pp. 435. 25s.

THIS book is a solid contribution to what the authors describe as the "hybrid subject of chemotherapy, the boundaries of which stretch from organic chemistry through biochemistry and physical chemistry to bacteriology, pharmacology, and therapeutics." The historical introduction, which ranges from early Chinese herbal remedies to streptomycin, is followed by informative chapters on cell metabolism, essential metabolites, and enzyme inhibition. This fundamental aspect of chemotherapy, dealing with advanced chemical problems, will be of especial interest to doctors with inquiring minds. The chapters on drug antagonism and drug resistance bring together much scattered work on an aspect of chemotherapy which is partly chemical and partly biological. The book ends with a logical chapter on the relation of structure and activity of drugs, followed by an extensive and well-selected bibliography, in which justice is done to the numerous contributions of British workers. The book should appeal not only to those who work in any branch of chemotherapy, but also to the senior student who wishes to broaden his knowledge.

Osteo-arthritis of the Hip-joint

H. WARREN CROWE, D.M. London: Pulman & Sons. 1948. Pp. 70. 35s. 6d.

Dr. Warren Crowe says that "textbooks should summarise ideas which are generally accepted by members of the profession, and advocate methods of treatment which have the full support of specialists in that particular subject." His own book, he points out, is not a textbook but a monograph founded on personal experience of a large number of cases of osteo-arthritis of the hip-joint. He includes under this heading all forms of arthritis of the joint, at whatever age it occurs, and (if the usual classification is accepted) of varying ætiology. He gives a detailed account of the anatomy and pathology of the hip-joint, and discusses the diagnosis and the clinical examination of the patient. He attaches great importance to the differential white-cell count, sedimentation test, examination of the blood for hypo- or hyper-œstronæmia, and a test for liver dysfunction.

It is a difficult book to understand. Dr. Crowe holds the view that osteo-arthritis is caused by infection, and that basic or ætiological treatment is by the use of vaccines. However, he does point out that the presenting symptoms of pain and stiffness arise mainly from the synovial membrane and that the adductor spasm is closely associated with these inflammatory changes. Most people will agree with him that intra-articular injections and physical measures may relieve these symptoms, but the evidence he offers that infection causes osteo-arthritis, and that vaccine therapy will arrest the process of the disease, remains unconvincing.

Syphilis

HENRI MATHIAS. Paris: Maloine. 1947. Pp. 722. Fr. 600.

THIS is a long discursive book in which the author has much to say about the treatment of syphilis, little about diagnosis, something about the public-health aspects of the disease, and a great deal about his own very unorthodox ideas. His methods of treatment place great reliance on two drugs—arsphenamine and mercury—which are not now much used in this country, and his method of giving these is unusual. He is extremely critical of some of his colleagues who favour long-continued treatment with bismuth and have little confidence in the possibility of ultimate cure. Discussion of penicillin is limited to two pages, and it is clear that the drug is not highly esteemed. Dr. Mathias is quite prepared to use his methods of treatment for the prophylaxis of syphilis, a proceeding which some of his colleagues and most experts in this country consider to have considerable dangers. His views on congenital syphilis as a cause of a number of common skin conditions such as psoriasis and herpes zoster, and as a predisposing cause of conditions like chronic appendicitis and diabetes, are frankly heretical, and would require more than the forcible expression of his personal opinion for even limited acceptance. If this book is at all representative of Continental ideas about syphilis, then we have indeed diverged from the views of our near neighbours who in the past have contributed so much to the subject.

Chest Examination (3rd ed. London: J. & A. Churchill. 1948. Pp. 170. 12s. 6d.).—Dr. R. R. Trail's little volume attempts to correlate physical findings and radiographic appearances over the whole range of chest diseases. It is a provocative book, and both clinicians and radiologists may be tempted to criticise some of the arguments; but the final-year students and house-physicians for whom it is written will find it of great value. As Sir Walter Langdon-Brown wrote in his foreword to the first edition, it will give them "a grasp of the first principles involved, which will enable them to arrive at a correct opinion without imposing burdensome details on their memory."

The Clinical Apprentice (Bristol: J. Wright. 1948. Pp. 200. 15s.).—This little book is intended for the student beginning his medical clerking. Dr. John Apley and Dr. John M. Naish give simply and clearly the bedside teaching from which accurate diagnosis must be learnt, and on which the foundation of medical training is based. It cannot, of course, replace practical demonstration and instruction at the patient's bedside, but it does give simple reasons for clinical methods and sound principles of history-taking and examination. If one of the failings of the newly qualified is that he thinks he can run before he can walk, it will be remedied by such a book as this; and many failures in higher examinations are due to poor grounding in the fundamental principles given here.

Pharmacology (3rd ed. London: Oxford University Press. 1948. Pp. 504. 25s.).—This work by Prof. J. H. Gaddum, F.R.S., is widely recognised as a standard textbook on pharmacology for undergraduate students. Its directness of statement, informed by clear thought and spiced with occasional droll comment, compels attention. The rapid advance of the subject can be gauged by comparing the meagre legacy of synthetics—the coal-tar antipyretics and aspirin—left by the Victorians, with the wealth of new drugs devised during the present century. Many substances make their first appearance in this edition, including dimercaprol (BAL), the anti-histamine compounds, 'Paludrine,' streptomycin, and folic acid; but the design of the book goes far beyond that of the old materia medica or compendium of useful remedies which so often in the past has masqueraded as a textbook on pharmacology: the author builds up a concept of the background of experiment. The student will be grateful for the increased understanding this brings, not only at examination time but in future practice when appraising the probable worth of new drugs.

The Trial of Gozawa Sadaichi (War Crimes Trials, vol. III. London, Edinburgh: Wm. Hodge. 1948. Pp. 245. 18s.).—An English barrister, Mr. Colin Sleeman, was assigned to defend nine Japanese officers and N.C.O.s charged with maltreating (and in one case beheading) Indian soldiers who were prisoners-of-war. In editing the proceedings for publication he has, in a lengthy introduction, analysed and expounded the mentality of Japanese military witnesses. The trial has otherwise only slight medicolegal interest. To British eyes Orientals tend to look alike. There was difficulty in identifying the accused from photographs. In later cases, we learn, care was taken to provide two photographs of each man (one full-face and one in profile) hatless and clean-shaven. One of the accused was released during the trial; the rest were convicted and sentenced. The court rejected two points submitted by the defence—first that Japan had never signed the 1929 International Convention on the Treatment of Prisoners of War, and secondly that the Japanese regarded their Indian captives as "auxiliaries" or collaborators. The evidence is sometimes tortuous and tedious, but the book shows the success of the attempt to make this, the first "war crimes" trial under British jurisdiction in the Far East, a model of fairness.

THE LANCET

LONDON: SATURDAY, DEC. 25, 1948

Christmas

"It is now Christmas, and not a cup of drink must pass without a Carol: the beasts, fish, and fowl come to a general execution, and the corn is ground to dust for the bakehouse and the pastry.—Now good cheer and welcome, and God be with you."—NICHOLAS BRETON, *1626.*

e trend of the age is towards uniformity, in people, ces, and times. The common man has common pinions; everywhere his towns and homes are losing individuality; and the days of the week are ated alike. We no longer wear Sunday clothes, we eat sausages and ice-cream throughout the . Fruit is esteemed more highly for appearing out season than for natural flavour. We seem, indeed, seek a dead level at which we shall have everything all times, and nothing therefore will be worth having. all this we depart from the habits of our ancestors, hose life changed so much with the seasons and who re so conscious of variety within a basic rhythm. o the countryman, even today, the best weather is t good weather but seasonable weather: things ould happen at their proper times. Likewise from antiquity there have been fasts and festivities per to the times of year; and very long ago our fathers decreed that mid-winter, soon after the rtest day, was the proper season for a festival of e—the time when families and friends should be thered before a fire and shout defiance at winter at fate. Like ourselves they had plenty of cares; they were perhaps more fully aware of the need prevent monotony by deliberate changes of mood by feasts as well as fasts. Their festival at mid-nter was already a festival of hope long before it eceived its new name from the Christian church; ut now the hope has a deeper significance through its ssociation with the great idea of good will among en, as children of one father. In 2000 years this dea has lost none of its validity; and its strength, ith our own, can be renewed at Christmas.

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Smoke

DEATH from poisoned air has always had peculiarly terrifying associations. Yet over the centuries the thought and fact of atmospheric pollution has been presented so gradually and familiarly that it is hard to persuade the public that poisonous fumes are no less lethal when generated by industry, and no more genial when derived from the family hearth. Not long ago we commented[1] on the disaster at Donora in the United States, where 18 elderly patients died in one day, and 200 people came under treatment, from the effects of smoke and fog which had been kept at low levels by an accident of weather. It true that the fog at Donora probably had a hi concentration of exceptionally poisonous fumes fr a zinc-smelting plant; but ordinary fog, such as have lately experienced, is well enough laden w milder poisons; and every year, in cold foggy weath many elderly people die before they need—just surely as the Donora victims, if less spectacular If it is hard to assess the harm that atmosphe pollution does to health, it was no doubt equa hard, in the old days, to assess the harm done defective sanitation. The results of cleansing t air might be little less remarkable than those cleansing the water.

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The Basis of Chemotherapy

T. S. WORK, B.SC., PH.D., a member of the research staff, National Institute for Medical Research, London; ELIZABETH WORK, B.A., PH.D., a member of the research staff, University College Hospital medical school, London. Edinburgh: Oliver & Boyd. 1948. Pp. 435. 26*s.*

THIS book is a solid contribution to what the authors describe as the "hybrid subject of chemotherapy, the boundaries of which stretch from organic chemistry through biochemistry and physical chemistry to bacteriology, pharmacology, and therapeutics." The historical introduction, which ranges from early Chinese herbal remedies to streptomycin, is followed by informative chapters on cell metabolism, essential metabolites, and enzyme inhibition. This fundamental aspect of chemotherapy, dealing with advanced chemical problems, will be of especial interest to doctors with inquiring minds. The chapters on drug antagonism and drug resistance bring together much scattered work on an aspect of chemotherapy which is partly chemical and partly biological. The book ends with a logical chapter on the relation of structure and activity of drugs, followed by an extensive and well-selected bibliography, in which justice is done to the numerous contributions of British workers. The book should appeal not only to those who work in any branch of chemotherapy, but also to the senior student who wishes to broaden his knowledge.

Osteo-arthritis of the Hip-joint

H. WARREN CROWE, D.M. London: Pulman & Sons. 1948. Pp. 70. 35*s.* 6*d.*

Dr. Warren Crowe says that "textbooks should summarise ideas which are generally accepted by members of the profession, and advocate methods of treatment which have the full support of specialists in that particular subject." His own book, he points out, is not a textbook but a monograph founded on personal experience of a large number of cases of osteo-arthritis of the hip-joint. He includes under this heading all forms of arthritis of the joint, at whatever age it occurs, and (if the usual classification is accepted) of varying ætiology. He gives a detailed account of the anatomy and pathology of the hip-joint, and discusses the diagnosis and the clinical examination of the patient. He attaches great importance to the differential white-cell count, sedimentation test, examination of the blood for hypo- or hyper-œstronæmia, and a test for liver dysfunction.

It is a difficult book to understand. Dr. Crowe holds the view that osteo-arthritis is caused by infection, and that basic or ætiological treatment is by the use of vaccines. However, he does point out that the presenting symptoms of pain and stiffness arise mainly from the synovial membrane and that the adductor spasm is closely associated with these inflammatory changes. Most people will agree with him that intra-articular injections and physical measures may relieve these symptoms, but the evidence he offers that infection causes osteo-arthritis, and that vaccine therapy will arrest the process of the disease, remains unconvincing.

Syphilis

HENRI MATHIAS. Paris: Maloine. 1947. Pp. 722. Fr. 600.

THIS is a long discursive book in which the author has much to say about the treatment of syphilis, little about diagnosis, something about the public-health aspects of the disease, and a great deal about his own very unorthodox ideas. His methods of treatment place great reliance on two drugs—arsphenamine and mercury—which are not now much used in this country, and his method of giving these is unusual. He is extremely critical of some of his colleagues who favour long-continued treatment with bismuth and have little confidence in the possibility of ultimate cure. Discussion of penicillin is limited to two pages, and it is clear that the drug is not highly esteemed. Dr. Mathias is quite prepared to use his methods of treatment for the prophylaxis of syphilis, a proceeding which some of his colleagues and most experts in this country consider to have considerable dangers. His views on congenital syphilis as a cause of a number of common skin conditions such as psoriasis and herpes zoster, and as a predisposing cause of conditions like chronic appendicitis and diabetes, are frankly heretical, and would require more than the forcible expression of his personal opinion for even limited acceptance. If this book is at all representative of Continental ideas about syphilis, then we have indeed diverged from the views of our near neighbours who in the past have contributed so much to the subject.

Chest Examination (3rd ed. London: J. & A. Churchill. 1948. Pp. 170. 12*s.* 6*d.*).—Dr. R. R. Trail's little volume attempts to correlate physical findings and radiographic appearances over the whole range of chest diseases. It is a provocative book, and both clinicians and radiologists may be tempted to criticise some of the arguments; but the final-year students and house-physicians for whom it is written will find it of great value. As Sir Walter Langdon-Brown wrote in his foreword to the first edition, it will give them "a grasp of the first principles involved, which will enable them to arrive at a correct opinion without imposing burdensome details on their memory."

The Clinical Apprentice (Bristol: J. Wright. 1948. Pp. 200. 15*s.*).—This little book is intended for the student beginning his medical clerking. Dr. John Apley and Dr. John M. Naish give simply and clearly the bedside teaching from which accurate diagnosis must be learnt, and on which the foundation of medical training is based. It cannot, of course, replace practical demonstration and instruction at the patient's bedside, but it does give simple reasons for clinical methods and sound principles of history-taking and examination. If one of the failings of the newly qualified is that he thinks he can run before he can walk, it will be remedied by such a book as this; and many failures in higher examinations are due to poor grounding in the fundamental principles given here.

Pharmacology (3rd ed. London: Oxford University Press. 1948. Pp. 504. 25*s.*).—This work by Prof. J. H. Gaddum, F.R.S., is widely recognised as a standard textbook on pharmacology for undergraduate students. Its directness of statement, informed by clear thought and spiced with occasional droll comment, compels attention. The rapid advance of the subject can be gauged by comparing the meagre legacy of synthetics—the coal-tar antipyretics and aspirin—left by the Victorians, with the wealth of new drugs devised during the present century. Many substances make their first appearance in this edition, including dimercaprol (BAL), the anti-histamine compounds, 'Paludrine,' streptomycin, and folic acid; but the design of the book goes far beyond that of the old materia medica or compendium of useful remedies which so often in the past has masqueraded as a textbook on pharmacology: the author builds up a concept of the background of experiment. The student will be grateful for the increased understanding this brings, not only at examination time but in future practice when appraising the probable worth of new drugs.

The Trial of Gozawa Sadaichi (War Crimes Trials, vol. III. London, Edinburgh: Wm. Hodge. 1948. Pp. 245. 18*s.*).—An English barrister, Mr. Colin Sleeman, was assigned to defend nine Japanese officers and N.C.O.s charged with maltreating (and in one case beheading) Indian soldiers who were prisoners-of-war. In editing the proceedings for publication he has, in a lengthy introduction, analysed and expounded the mentality of Japanese military witnesses. The trial has otherwise only slight medicolegal interest. To British eyes Orientals tend to look alike. There was difficulty in identifying the accused from photographs. In later cases, we learn, care was taken to provide two photographs of each man (one full-face and one in profile) hatless and clean-shaven. One of the accused was released during the trial; the rest were convicted and sentenced. The court rejected two points submitted by the defence—first that Japan had never signed the 1929 International Convention on the Treatment of Prisoners of War, and secondly that the Japanese regarded their Indian captives as "auxiliaries" or collaborators. The evidence is sometimes tortuous and tedious, but the book shows the success of the attempt to make this, the first "war crimes" trial under British jurisdiction in the Far East, a model of fairness.

rent diets for about nine months, and found that t rich in protein, and also one with a high proporof fat, caused diminution in islet volume, which lightly raised, on the other hand, in the animals ving a high-carbohydrate diet. In such experits the comparative calorie intakes of the animals he different diets may be of commanding import; and Prof. H. P. Himsworth in the R.S.M. ssion did well to recall the dramatic fall in etic mortality in this country which followed the sition of food-rationing during the 1914–18 war, again during the late war. Mortality rose again the first world war but not after the second, rationing was (as we are all well aware) cond; and there is a strong probability that the n mortality had something to do with the restricin people's choice of food. Professor Himsworth ted out that the curve showing reduction in etic mortality and the curve showing reduction in total fat content of the diet are remarkably llel. (Surprisingly enough, the protein content e diet of the nation as a whole has tended to rise g the past few years, though it may well be that meat protein component has fallen.) He was ious in his conclusions, but his data supported the that rationing has reduced the incidence, as well e mortality, of diabetes.

. R. D. Lawrence reviewed the work done since dramatic report in 1943, by Shaw Dunn and his agues,[5] that alloxan causes necrosis of the β cells e pancreatic islets and consequent diabetes. As he said, there is no substantial evidence that etogenic doses of alloxan are ever produced metaally in the animal body; indeed it is unlikely alloxan diabetes occurs naturally. But the value simple a tool for the experimental induction of tes has been immense, and it is greatly to be tted that Professor Shaw Dunn lived so short a after his important discovery. So far alloxan unfortunately proved of little value in the ment of hyperinsulinism in human beings. h investigations continue.

veloping his suggestion that there are hereditary ences between diabetes appearing early and in life, Dr. Harris discussed observations that e assumption that the milder cases of late onset heterozygotes for the abnormal gene, while the e cases of early onset are homozygotes. This mption would account for many of the facts dy known about familial distribution and popula frequencies; but, as Dr. Harris said, much e work is needed to test it. He has found that ome families (mostly those with the disease in der form) diabetes picks out mainly the females in other families mainly the males, and this pens more often than it would if it were simply ndom process. He also raised the question of diabetes is maintained in the general population pite the fact that juvenile diabetics are liable to before they have completed the reproductive e of their life. One would expect that in each ceeding generation the genes determining the enile type of disease would be less and less repreed. But the later the disease develops, the less y is it to diminish effective fertility; and Dr. Harris mentioned an interesting observation that the proportion of women who bear a child or children may actually be higher among "elderly" diabetics than among non-diabetics of the same age-group. There is no unequivocal evidence for a greater fertility among diabetic or potentially diabetic women as compared with non-diabetics, but the suggestion deserves further study.

No adequate and simple conclusion about the cause of diabetes can be drawn from the mass of data that is still accumulating. But the picture as a whole is becoming less rather than more confused. Careful analysis of hereditary factors in human diabetes has already produced some simplifying hypotheses, while the fact that the pancreatic islets are affected by so many, apparently different, methods of inducing diabetes is in itself encouraging. Dr. and Mrs. Cori, whose share in the Nobel prize for medicine in 1947 was so well deserved, have initiated researches concerning the in-vitro influence of hormones on the enzyme hexokinase which are of fundamental significance; and it is perhaps not too much to hope that such investigations will one day reveal that diabetogenic agents interfere at relatively few points with the normal processes of carbohydrate metabolism. That genetic, hormonal, and dietetic factors may all, directly or indirectly, affect carbohydrate metabolism by influencing a single enzyme system—or at least only a few such systems—is an attractive possibility revealed by the research of the last few years.

Osteopathy

"About things on which the public thinks long," said Samuel Johnson, "it commonly attains to think right." And we have to accept the fact that public opinion has come to lean on osteopaths for several types of treatment; that kings, nobles, and the common people patronise them; and that the medical profession is widely blamed for its grudging reception of the new ideas. In 1934 a Bill was introduced into the House of Lords, "to place the practice of osteopathy, as a developing system of treatment of diseases by manipulative methods, under the control of a statutory board." One of its sponsors, Lord Elibank, argued that the Medical Acts were never intended to put obstacles in the path of new methods in the treatment of disease; osteopathy, he said, was a new line of thought, and an Act was required to protect the public from the malpractice of persons "unqualified" in osteopathy. Lord Moynihan, on the other hand, denounced osteopathy as a spurious science, "the derision of all competent and experienced minds," and feared that if it were encouraged other cults would soon be clamouring at the gates of Parliament. In this he was supported by Lord Dawson of Penn, who felt that the honourable path for the osteopath seeking recognition was the arduous one—to qualify first, in order to obtain the privileges of the doctor, and then to turn to his particular love, as the homœopath has done for generations past.

The Bill, after its second reading, was referred to a select committee, which subsequently advised that it be rescinded. During its discussion the fact emerged that in the United Kingdom at that time there were only about 170 men and women "qualified" in osteopathy, though some 2000–3000 were engaged

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unn, J. S., Sheehan, H. L., McLetchie, N. G. B. *Lancet*, 1943, i, 484. Dunn, J. S., McLetchie, N. G. B. *Ibid*, ii, 384.

solid fuel burnt in an efficient appliance. It is easy to sympathise with his feelings, especially as most people find a coal fire companionable, and some have beautiful ancient grates which they wish to keep.

Actually, much of the fuel saving of recent years has been achieved in industry; for there is some legal restriction over all forms of smoke except that from domestic chimneys. Much of this consists in inflicting fines after the nuisance has been caused, but some local Acts—such as the City of London (Various Powers) Act, and the Manchester Act, both passed in 1946, and a spate of others passed subsequently—aim at prevention. Thus the City of London Act gives the common council power to make by-laws requiring that in new buildings, and in buildings where the heating arrangements are being substantially altered, the new equipment should be chosen "to prevent or reduce to a minimum the emission of visible smoke." Presumably this refers to business houses rather than factories where furnaces are used; nevertheless the abatement of smoke by such regulations should be considerable. In many industries, Mr. MARSH notes, coal-fired kilns are being replaced by kilns using producer-gas, town gas, and electricity; and in many others better instruments for measuring fuel consumption, more efficient control of draught, and better stoking have made fuel waste and smoke production negligible. The National Smoke Abatement Society recommend modernisation of coal-burning plant, approval of new plant by a competent authority, better training for stokers, more research on pollution, and of course a greater use of smokeless fuel as this becomes available. Another policy they favour is the setting-up of smokeless zones, such as the one planned for Manchester, where the 1946 Act requires that "no smoke shall be emitted from any premises in the central area," and where the corporation may, if it thinks fit, "contribute the whole or part of the expense necessarily incurred by any person in making premises smokeless." (Unfortunately little active progress seems to have been made yet, except in Salford, which is taking the lead.) Clearly such smokeless zones could begin as scattered centres, and be extended until whole cities were included; and the plan is flexible, and allows for minor infringements such as the production of smoke when a cold boiler is being lighted up.

Most of the Simon report's thirty-five practical recommendations still need trying. Meanwhile we live under a cloud. One of the weaknesses of our position is that we can do little as individuals; but this situation was paralleled in the 19th century when the pioneers of public health were fighting our battles for clean water. The National Smoke Abatement Society are doing much to create an informed public opinion. Already before the war they were printing pamphlets to guide householders who wished to install better appliances, and they will always give advice to those who ask it. Also the Solid Smokeless Fuels Federation[5] publish a brochure showing types of grate and recommending appropriate smokeless fuels. The trouble is that most of us have underdeveloped consciences about smoke. But the periods of fog we have already experienced this winter may paradoxically have lightened our darkness.

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[5] 1, Grosvenor Place, London, S.W.1.

The Cause of Diabetes

THOUGH nearly thirty years have passed insulin was discovered by BANTING and BES cause of diabetes mellitus remains unknown. interest is very far from flagging, as is shown l Banting memorial lecture by Prof. F. G. Y which we published last week and by the disc he opened at the Royal Society of Medicine on D In this discussion he pointed out that as "di mellitus" may comprise more than one cond and as there are several ways of inducing it e mentally, there are possibly many related pro to be solved rather than a single one. The ide it exists in more than one form was also brough by Dr. H. HARRIS in speaking on the genetic a A series of 1241 diabetics, he said, was divide two groups, according to whether they develope disease before or after thirty years of age, and i found that the former, but *not the latter*, l significantly higher rate of cousin marriages i parents; which suggests hereditary differences be cases of late and early onset.

Experimentally there are five main metho producing diabetes; at least four of which in direct or indirect interference with the pan These five methods are: (1) pancreatectomy, plete or partial; (2) the administration of all which brings about rapid necrosis in the β co the pancreatic islets; (3) the administratio anterior-pituitary extracts, which may lead persisting diabetes associated with lesions in islets; (4) the administration of excessive dos glucose, which in a partially depancreatised ca even in a normal one) may produce persisting diab again also associated with lesions in the islets[1]; (5) the administration of certain adrenal steroids, which can cause glycosuria in animals must also mention the glycosuria that may fol administration of large doses of adrenoc to the rat[2] or to man,[3] which is presumably by the hypersecretion of adrenal cortical Professor YOUNG distinguishes between " physeal" diabetes, which exists during a period daily injections of diabetogenic anterior- extract, and "metahypophyseal" diabetes, persists after such treatment has ceased. The is associated with structural changes in the islets Langerhans, which have been clearly elucidated Mr. K. C. RICHARDSON, and perhaps it can exist clinic in the absence of any sign of pituitary hyperfuncti

Professor YOUNG has found that after a high-carbohydrate diet dogs are less tive to the diabetogenic action of anterior-pit extract than they are after taking a diet a high proportion of meat protein. He has shown that in the dog with metahypophyseal ketonuria is much greater when the diet largely of lean meat than when it contains a proportion of fat. Relevant to these observations those of TEJNING,[4] who estimated the volume of islets of Langerhans in the pancreases of rats b

1. Dohan, F. C., Lukens, F. D. W. *Endocrinology*, 1948, 42,
2. Ingle, D. J., Li, C. H., Evans, H. M. *Ibid*, 1946, 39,
3. McAlphine, H. T., Venning, E. H., Johnson, L., Schenker, Hoffman, M. M., Browne, J. S. L. *Proc. Ass. Study Secretions* (U.S.A.), 1948.
4. Tejning, S. *Acta med. scand* 1947, 128, suppl. 108.

and other instruments should be illumined with light, for night driving, to maintain the driver's adaptation. In the absence of a governor, a ing red light or an auditory signal might be ed to indicate fifty-five miles per hour. A frame body of welded "unit construction" would be , and should include crash struts, he suggests, those in aircraft. Windows and windscreen should made of plastic, not glass, and so should headlight . Both windscreen and rear window should be d nearer the vertical than has been the fashion y, since the driver can see better through a vertical , especially in rain, sleet, or snow. Efficient wind- n-wipers and defrosting equipment should be lied for both the windscreen and the rear window, the range of outlook for the driver should be as wide possible. Dr. Woodward proposes a windscreen g a range of 360°, and this principle is embodied design for a safe car, by Mr. Stewart Rouse,[2] which panies the article: here the windscreen forms bow, and the front supporting column of the roof been moved back to a point just beside the wheel, is as slender as its purpose allows. The rear support-column is placed well behind the driving seat, so the driver has a broad pane at his side and a wide of vision ahead. Doors should conform to a pattern; and windows—which should all be enough for a man to get through—should have high enough to discourage passengers and driver using them as arm-rests. All cars should have latches having a safety lock, to prevent children getting the doors open while the car is ing.

ers offer great scope for improvement. Mr. 's design follows the dodgem principle: rubber rs, coloured to match the paint-work, encircle the car. The front bumper, Dr. Woodward suggests, be mounted, like the landing gear of aircraft, "oleo shock-absorbers"; and tyres should be d to give the maximum degree of traction with best antiskid qualities—points on which judgment be passed by some disinterested agency. Blow-proof tubes should be used at the expense of some g comfort, if need be.

re is probably responsible for more night accidents any other single cause. A glare-proof rear-view or would save the driver much discomfort, and so a polarised windscreen to minimise glare from road surface. If headlight lenses were oppositely ised, the sudden intermittent call on the driver's of light and dark adaptation would be abolished, with it one of the greatest risks of night-driving. in the moment of blindness after the glare that motorist kills the invisible child or rides down the who depends on a muddy reflector. Cars them- should be made more visible by the use of reflectors the corners of the fenders and the top, by dual tail s, and by a large "stop" light. Luminous paint be used on the outside margins of trailers, and ps also of lorries and buses; and luminous paint also be tried for strip-marking on highways.

nside the car there should be no shiny reflecting ces just under the driver's eye: the dashboard ld be a dull black, and chromium trimmings should reserved for other regions. The steering-column be built to move forward under a force of about foot-pounds, a device which would do much to save rs from injuries to the chest; while sponge crash- on the dash and the back of the front seats would many head injuries. Projecting handles, knobs, buttons should be eliminated; and safety belts— h are standard equipment in aircraft—might be among the most effective single factors in preventing damage to motorists.

These are evidently only a selection of devices which have occurred to Dr. Woodward; and any driver will be able to add to the list if he sits and thinks about it. We could, if we would, now build cars capable of withstanding collisions, and even of leaving the road at high speed and overturning without injuring the occupants: moreover, drivers of cars fitted with the safety devices outlined by Dr. Woodward would be less liable to have accidents. These important suggestions deserve to be studied seriously, for there are limits to the results which can be achieved by appealing to the skill and discretion of the public in using the roads. It is hardly justifiable to place all our faith on what he calls "attempts to bludgeon 'old Adam' into safer driving practices"; we must try to make the machines safer too.

SURFACE-ACTIVE COMPOUNDS IN THE CHEMOTHERAPY OF TUBERCULOSIS

IN the U.S.A. Dubos[1] has shown that certain surface-active water-soluble compounds stimulate the growth-rate of the tubercle bacillus. He used a phospholipid, which is a naturally occurring surface-active substance, and also Tween 80, a commercially available wetting agent. The stimulating action is inherent in the hydrophobic end of the Tween-80 molecule, which is an oleate: the remaining portion of the molecule is a water-solubilising complex which consists of a sorbitan nucleus attached to three polyethylene glycol chains. In the presence of the tubercle organism the surface-active Tween-80 molecule concentrates at the water-bacterium interface, with the hydrophobic portion of the molecule directed towards, or possibly entering, the bacterium. Between the surface of the tubercle bacillus and the medium in which it is suspended there forms an interface, one side of which is aqueous and the other lipid; at this interface the surface-active molecules concentrate. Tween 80 probably acts by concentrating a known metabolite (the oleate) where it is most readily available to the bacterium—namely, at the periphery of the cell or possibly within it. It also stimulates bacterial growth by dispersing the clumped bacteria. Eiseman,[2] in search of a method for enhancing the effect of known tuberculostatic drugs, has modified the Dubos principle. Instead of concentrating an essential metabolite at the surface of the bacillus he employs a tuberculostatic drug at the hydrophobic end of the surface-active molecule, thereby increasing the effective concentration of the drug at or beneath the cell boundary. The surface-active molecules, instead of being spread evenly throughout the solution, would be expected to concentrate at the periphery of the organism. Several compounds were prepared by combining tuberculostatic drugs, such as 4,4′-diaminodiphenyl sulphone and its derivatives, with synthetic surface-active compounds such as carbowax and polymers of ethylene and ethylene oxide. Thirteen compounds were tested, and with some of them a thousandfold increase in tuberculostatic effect was obtained by coupling with surface-active substances.

It is not known whether this new approach to the chemotherapy of tuberculosis has any practical value. Only in-vitro tests have been done, and it is not certain whether rendering tuberculostatic drugs surface-active increases their activity in vivo, nor whether their toxicity is altered in any way. If in-vitro testing shows enhanced tuberculostatic activity, it might be worth while to convert the more potent drugs used in the treatment of tuberculosis, such as streptomycin and p-aminobenzoic acid, into surface-active compounds in the hope that their activity will be increased.

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duced from *Popular Science Monthly*, April, 1947, in an article by Devon Francis.

[1] Dubos, R. *Proc. Soc. exp. Biol.*, N.Y. 1945, 58, 361; *J. exp. Med.* 1946, 83, 409.

[2] Eiseman, B. *J. exp. Med.* 1948, 88, 189.

in its practice. Their craft and art was not limited, as commonly supposed, to the skeletomuscular system: they claimed as their field "all diseases of any description," and the Bill proposed to give them the right to sign birth and death certificates, administer anæsthetics, and perform minor operations. But their methods were almost unknown on the Continent of Europe, and in this country the only existing establishments for the training and examination of osteopaths were of negligible importance and "in thoroughly dishonest hands." The select committee accordingly recommended that the establishment of a register of qualified osteopaths by Act of Parliament should be deferred until the sphere of osteopathy had been defined, and until a reputable system of education in its principles and practice had been developed in one or more well-equipped and properly conducted institutions in Great Britain.

This advice did not fall on deaf ears, and in 1946 the first step was taken—the constitution of the "Faculty of Osteopaths" was drawn up, and the "London College of Osteopathy" was established. The object of the college was to teach the theory and practice of osteopathy to "qualified medical men," and it was housed in the same building as the "British Osteopathic Association Clinic," from which it was to draw its clinical material. The new college can be regarded as a creditable attempt to organise and evaluate osteopathic ideas, and to curb the opportunist or the quack, and to this extent the enterprise appears commendable. But there remains a danger that the functions of such a college may come to be extended in such a way as to realise the claims of non-medical osteopaths who seek to practise medicine without the elaborate training required for medical diagnosis. This week we publish a report from two surgeons, Mr. SOL. COHEN and Mr. BATCHELOR, who have visited the college on our behalf. We share their opinion that osteopaths who undertake the full care of patients must first obtain a medical qualification, but we also agree with them that doctors who practise osteopathy should be given every chance of proving, in orthopædic departments, the value of their methods.

Better Late than Never

FROM October onwards the president of the Royal Medical Benevolent Fund has been saying that the time has come for contributions to its Christmas gifts. Unfortunately many of us find it impossible to think of any kind of present until, at earliest, Christmas Eve; by which time it may seem a little late to answer his appeal. The fact remains that the R.M.B.F. needs all the help it can get, both now and later; and outside their own circle our readers will find no better object for generosity than the relief of doctors and their dependants who have met one or other of the many kinds of misfortune that lie in wait for us all. Besides making grants, for support and for education, the fund has lately opened, for some of its older women beneficiaries, a house where they can live without hardship or loneliness. With support there will be others. Meanwhile a small present of money is going out again this Christmas to homes where it will mean a lot, both in comfort and in encouragement. Contributions and subscriptions should be sent to the R.M.B.F., 1, Balliol House, Manor Fields, London, S.W.15.

Annotations

DODGEMS

> "Mr. Williams, meet Miss Jones. You are go
> kill her in exactly twenty minutes' time."

In the Central Office of Information film *Worth Risk?* Miss Jones is the young lady who steps off curb and just keeps on walking—"they always Mr. Williams is the man in a hurry who is go get his brakes fixed tomorrow. This documen which is being shown in 3300 cinemas up and do country—explains with ironic coolness that, t we are all careful drivers and good pedestrians, body in Great Britain gets injured in a road ac every 3½ minutes. In the United States the cas rate is one death every 15½ minutes, and one every 26 seconds. Such hazards to life and safety hardly be tolerated on railways or air-lines: the would rightly demand an inquiry. But our own bear less hardly on us than those of official Our grandfathers thought that trains moved fast; the railings and regulations with which they fen permanent ways must have saved countless lives. vehicles, of course, are not as heavy as trains, but can move as fast, and they swerve. And they are by almost anybody.

Those who have in their time frequented circ recall the dodgem. Small cars are provided in patrons steer themselves, or fail to steer the (for the steering gear is deliberately capricious) a crowded floor. Crashes are inevitable—they are of the fun—but they do no harm because the little are encircled by massive rubber bumpers. Here germ of an idea which Dr. Fletcher D. Wood has lately considered in some detail. Studying the of road accident seen at the University Hospi Virginia, he found that the predominating injuries damage to the face and head received from the board, windscreen, or back of the rear seat; cr injuries to the chest caused by the steering-w injuries to the hip, pelvis, patella, or femur expo impact by protective rotation of the body; da the elbow projecting comfortably from the window; associated injuries to the abdominal viscera, lungs, brain. Many of these, he thinks, could be prev The National Safety Council in America has done work in reducing the mortality-rate; but this is enormous, and he thinks it would be more prof to shift attention, anyhow for the moment, to machine itself. During the war, many aeron safety devices were developed by the engineer and doctor in collaboration, among them such thin safer parachute harness, better placing and desi escape hatches, instruments, and control handles, oxygen and pressure equipment, safer clothing, stan isation of cockpits, and air-sea rescue equipment. same approach to cars should be rewarding.

Speed might well be considered first, for in Ame statistics it is a factor in 2 out of 5 fatal accidents; in 20% of all accidents in which speed was a factor car was travelling at more than fifty miles an hour. proposes the use of governors on all cars limiting top speed to fifty-five miles, but not interfering acceleration at lower speeds. A survey taken by American Automobile Association shows that this be more generally acceptable than might be sup Of 4102 people asked whether they would favour universal fitting of governors, 4 replied Yes for e 3 who said No. The speedometer, he considers, sh be at the top of the instrument panel directly op the driver, and should show, besides miles per hour, stopping distance in feet under average driving condit

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1. *J. Amer. med. Ass.* 1948, 138, 627.

UNIVERSITY AWARDS

STATE scholarships were offered in this country for the first time in 1920. The number was small—200 each year—and there was an overriding limit of £80 for maintenance, while the test of hardship was stringent. The scheme did little or nothing to help parents in the middle and lower-middle income ranges. Even so it was killed two years later on the ground that the country could not afford the money. Since the end of the late war we have done better. The number of State scholarships has been increased from 360 in 1945 to 800 in 1948. In addition, 100 technical State scholarships are now offered annually to students who have completed satisfactorily a course for the Ordinary National Certificate or Diploma. This has increased the opportunities for students who leave school at fifteen and continue their training by full-time or part-time courses. A further 20 State scholarships are offered to students over twenty-five.

A big attempt has also been made to increase the value of these awards, and to reduce the sacrifices which parents make—and we suspect always will make—for their children. In 1946 the limit of £100 on maintenance grants was removed, and it was decided that the "full standard figures of maintenance" should be payable by the Ministry of Education. It was also decided to supplement open scholarships and exhibitions awarded by universities up to the amount paid to State scholars. These reforms have meant that State scholarships are no longer used to supplement open awards, and that local education authorities are no longer called upon to supplement open and State scholarships: their awards can now be devoted to helping other children of good intellectual quality. Most local authorities have responded by increasing both the number and amount of their awards, which have risen from around 1500 in 1945 to 4000 in 1948.

Taken together, these improvements make an impressive total. But, as many parents know, opportunity is still limited and there are still anomalies and injustices. With these in mind, the Minister of Education appointed last April a Working Party to consider changes in the present system. Many of the recommendations in their report[1] are thoroughly sensible. They suggest, for instance, that in future no boy or girl should be compelled to promise, in exchange for a university education, to teach in a grant-aided school. They also do well in recommending that scholars should no longer be stopped from going to the university of their choice merely because that particular university's quota of scholarships has been filled.

The Working Party are also concerned to increase still further the number of awards and to improve their value. They propose that the number of State scholarships should be raised from 800 to 2000 and of local-authority scholarships from 4000 to 7000. This is ambitious; in the view of some who are in a good position to judge, too ambitious:

> "Quality," says Mr. W. W. Grave, PH.D., registrar of Cambridge University, *in a dissenting note to the report*, "must not be sacrificed to quantity. . . . If the university authorities are unable to recommend for awards as many candidates as the report contemplates, it is to be hoped that there will be no *feeling that they are placing unjustifiable* obstacles in the way of deserving pupils. It is notorious that once standards are lowered, they are very difficult indeed to restore."

Whatever figure is fixed, it appears certain that there will be a considerable further expansion. It becomes all the more important then to ensure that the awards, once made, are generous. At present, the income scale for assessing the value of awards to resident students starts at £600 and proceeds to a ceiling of £1500. A parent with an income above this figure must meet the whole of a State scholar's expenses, and a parent's contribution rises steeply in the upper reaches of
scale. True, in calculating the parent's contribu
an allowance of £50 is made for each depender
(other than the student), and extra allowances
made in respect of a child's education—up to
school fees and £100 for expenses of university educ
professional training. But these allowances are to
and a student who has won a State scholarshi
merits, but happens to be one of a large family, m
to forego a university education because the strai
parents would be insupportable. The Working
wisely recommend that the allowances should i
be doubled, and that the student's maintenance
include allowances for books, instruments, c
midday meals, travelling, subscriptions, and
money, as well as a contribution towards hi
during term-time and expenses during vacations.
improvements show an awareness of the difficultie
beset many parents today.[2]

The report also deals with the problem of th
are not eligible for any award because the income
£1500. This *ceiling introduces anomalies, for*
with three or four children and an income of £1
nothing although they are heavy taxpayers
those with one or two children and only £100
less are helped. The Working Party propos
the ceiling should be raised to *at least £2000*; t
increased length of the scale should be used to m
change in parental contribution more gradual, a
all students who qualify for a highly competitive
such as a State scholarship should derive some fi
benefit. Thus it is suggested that £30 a year
be given without regard to the parent's means.
concession would be welcome, though it seems inad
More important would be a recognition that a p
position above or below the income ceiling sho
ascertained *after* allowances have been made
other responsibilities.

MEDICINES UNDER THE ACT

WHAT is a medicine? Perturbed by the liberal
of some practitioners, the Minister of Health is
this question to the standing medical and pharm
advisory committees of the Central Health
Council. Meanwhile executive councils are asked
guided by two lists composed some years ago
expert advisory committee in relation to National
Insurance. One list is of substances which wer
sidered never to be drugs, and the other of su
(including a number of "tonic" preparations)
might sometimes be deemed drugs or medicines.
list has any statutory force. Composed in 1929
are not exhaustive. Of alcoholic liquors only b
champagne, and sherry are named as never being
"whereas in the Minister's view *all alcoholic*
should be similarly classed and should not be o
on E.C.10" (the National Health Service presc
form). Moreover, "while it is the practitioner's d
prescribe for a patient on his list whatever d
medicine is necessary for proper treatment, he i
of course, authorised to prescribe toilet requisi
foods or foodlike substances."

Executive councils are empowered by regulati
recover from the practitioner the cost of subs
prescribed by him under the Act which they de
to be drugs or medicines; and if the doctor w
challenge the decision he may ask for it to be refe
the local medical committee, with the possibility of
to referees. Given good sense on each side, such di
will be rare. The substances likely to cause real di
are those in the broad borderland between drug
food; it is here that the up-to-date ruling promi
the Minister is most urgently needed.

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[1] Report of the Working Party on University Awards. H.M. *Stationery Office.* 1948. Pp. 26. 9d.

[2] See *Manchester Guardian*, Nov. 20 and Dec. 3.

Special Articles

OSTEOPATHY

A VISIT TO THE LONDON COLLEGE

S. BATCHELOR F.R.C.S.
SOL M. COHEN F.R.C.S.

y, 1946, THE LANCET published an advertisement the London College of Osteopathy inviting applica- from registered medical practitioners to attend month course in osteopathy. Tucker (1946) the view that such publication was tantamount pathy and encouragement, and advised the profession to dissociate itself entirely from y. The dean of the college then invited THE to examine its work, and we later visited it as 's representatives.

VISIT TO LONDON COLLEGE OF OSTEOPATHY

ay be said at the outset that we were impressed integrity of our hosts. We came not as armed but as friendly listeners, determined to decide r or not the college was a "threat to public ." Admittedly, we were inclined to agree with that the organisers, while paying lip service to , might be out to gain their own ends. At once, , we were shown the manifesto of the faculty, clearly states that "ordinary medical training" be the sine-qua-non of any specialisation in their branch. The teachers appeared to be reason- rational people, with no extravagant enthusiasm, ey were ready to admit some of the defects of doctrine, particularly as regards the specula- thology of some of the lesions. Though much of ing in manipulative methods had still to be by non-medical osteopaths, anatomy and physio- ctures were being given by lecturers from some of medical schools in London. The non-medical were on the examining board, but the dean objection to the introduction, at a later date, of examiners. The clinical material was limited to 500 cases a year, but he was hopeful of being able nd this.

took the opportunity of independent discussions the "student" doctors—some six of them—and why they had entered this particular field. All a conviction that this was a neglected part of studies. We are all aware of the "unconven- " type—those with a bias and a grudge and a to flaunt recognised medical authority. We are ware of the temptation to reap the monetary said to be associated with this type of practice. ch thoughts may be dismissed as doing less than to men who seemed sincere and earnest.

were given a demonstration on four patients:

first was a middle-aged man suffering from backache and ; he had had several previous attacks, and he had been treatment for six weeks. Apparently he had hobbled e clinic on crutches, and during this time had shown improvement. The demonstrating surgeon attri- the lesion to a displacement of the sacrum on the he determined this mostly from the relative position posterior superior spines of the sacrum. He then a series of manipulations, designed to correct this

second was a lady with headaches, said to be migrainous, stiff, painful neck; she had had previous manipulations. aminer—a non-medical osteopath—included an exami- of the abdomen, and was not impressive in his reference g able to feel a "sandy" bowel, indicating a need for avage. He claimed that he could distinguish that the eads" were tied down, and the first part of his treat- onsisted in traction on the ribs via the scapula, in an "embracing" method. He claimed that there was isplacement of the neck vertebræ, which it was difficult for us to appreciate. The neck was then manipulated, in what seemed most able fashion.

The third was a young man with a painful neck, and a history of injury in an armoured vehicle during the war. Recently there had been a return of the painful stiff neck. The manipulator—an experienced American osteopath—after a brief examination indicated that there was a primary osteopathic lesion, with secondary local effects. His plan of treatment was to reduce the primary joint lesion first, and the secondary lesions later. His manipulations were of some purpose, for he repeated them some six or eight times, until he was satisfied that the "displacement" had been corrected.

The fourth was a middle-aged woman, with classical low backache. Again a subluxation of the sacrum on the ilium was diagnosed, and manipulation undertaken to correct it.

THE OSTEOPATHIC LESION

The osteopathic lesion is defined as "essentially an unbalance of a joint, not amounting to a dislocation": the word lesion encompasses all tissues—the overstretched ligament, the taut connective tissue, and the contracted muscle. It is contended that this lesion may influence all the blood and lymph vessels, and also the nerves, with their cell origins and connexions. The effects may thus be both local and remote.

Such lesions are found chiefly in the joints of the pelvis, spinal column, and ribs, and involvement of intervertebral discs is considered important. Osteopaths emphasise the osteopathic lesion as a constant ætiological factor in functional or organic conditions, but do not deny the existence of other ætiological factors, such as infection and chemical and metabolic disturbances. They argue that while orthopædic surgeons are ready to admit and accept the lesion as an isolated affliction of the joint or tissue, they have failed to appreciate its significance as a cause or predisposing factor in disease. By failing to preach the latter concept, the orthopæd has deprived the community of a valuable additional method of dealing with ill health.

The occasional existence of an "unbalanced joint" as a clinical entity cannot be denied. It is appreciated and accepted by the orthopædic surgeon. As Marlin (1934) put it, "there may not necessarily be any joint displacement, but a state of fixation or torsion of the bones on their long axis," and manipulative reduction may be required, "because no provision is made in the human mechanism for overcoming such defect." Reference to the simple finger hinge joint best illustrates this; the flexor and extensor muscles here act in one plane, and are unable to correct by active effort any lateral flexion or rotation brought about by violence. Nor could such voluntary action reduce any active joint subluxation, for this necessitates first separating the joint surfaces by traction, for which there is no voluntary mechanism.

Where osteopathy seemed to us to fail was in its wholesale claims for the presence of such mechanical disorders. At our visit we felt that the cases were approached with the conviction that such an osteopathic lesion was obviously present (but these were, of course, selected cases). The examiners too readily convinced themselves of the existence of fine variations in the relations of anatomical bony points—variations not always clear to us, and not greater than was to be expected as within normal limits. It might be argued that, not having received "osteopathic" training, we could not readily detect fine variations; but as surgeons of twenty years' standing, we believed that this should have been within our compass. X-ray films, which are used as an aid in excluding disease, do not show the osteopathic lesion: but we accepted the possibility that minor rotations—no displacement but a fixation—could not be demonstrated radiographically.

The osteopath has also magnified the extent of the lesion by allusions to "bones out of joint," which may be but a pandering to the "baby language" suitable for the lay patient, just as we talk of "nerves" to explain the anxiety state. But to tell the patient that a bone has been replaced, when nothing of the sort has been done, is dishonest; particularly if the purpose is to discredit and disrupt the medical attendants' efforts. Our hosts *certainly indulged in no such language.*

The belief that such a lesion can by itself be a cause of disease seemed to us completely without foundation, and the medical profession can hardly be expected to yield to hypotheses based on "I believe, because I believe." It is true, as Kellgren and Lewis have shown (Lewis 1942), that there may be reflex referred visceral manifestations from somatic foci, and the subject is now being intensely studied. But resultant disease has never been demonstrated, and we cannot accept the idea that osteopathic adjustment will influence say pneumonia, tic douloureux, angina pectoris, or gall-bladder disease—to name but a few of the osteopaths' claims.

Some of the medical profession, recognising that the human will is a capricious thing, believe that osteopathy caters mostly for the "psychological" factor, which in turn may influence physiological processes. This view may sometimes be justified; but on the whole we felt that, judging from our hosts, it was prejudiced. And that brings us to the oft-repeated taunt of many a layman that doctors are prejudiced against osteopaths. We may quote the words of the late Lord Passmore in answer: "if you meet what you call an unprejudiced person, that means simply he has the same prejudices as yourself."

MANIPULATIVE METHODS

The osteopath has undoubtedly given much thought and attention to technique, and has a kitbag of technical tricks. The manipulations were beautifully performed, with skill and gentleness, and without pain; there was a light, easy, confident grasp, with ability to reassure the patient and gain his assistance in relaxation.

They have not attempted to shroud their methods in mystery; orthopædists have been welcomed and given full assistance and opportunities. In the '30s there was in fact a great revival of interest in these methods, and books on the subject were published by orthopædic surgeons. In more recent years orthopædic interest seems to have waned, and experience indicates that such general lack of interest is not to be discounted, for it is often due to *unsatisfactory or indifferent results.* One reason may be that the standard of management of the fracture and the soft-tissue injury is now far higher than it was; early ambulation and movements have been adopted, and the rôle of patient and masseuse reversed (a LANCET annotation summed it up well as "active patient, passive masseuse"). In consequence the stiff shoulder *and other joint fixation disabilities* no longer come to need manipulation or wander off to the osteopath for this.

Be that as it may, it has to be admitted that the osteopath has made a definite contribution to this aspect of treatment. His manipulative methods are not readily *acquired from the textbook, and can only be truly* appreciated by visual demonstration. These methods did not seem to us to be beyond the scope of the medical practitioner, and certainly the orthopædic surgeon can, and does, perform such manipulations with skill and proficiency. *That there is a knack is true; as Marlin* put it, "to turn the key in a difficult recalcitrant lock, is not a matter of force." As in golf, a certain measure of timing and velocity of motion are *required for strength* and direction. It was not clear to us why multiple repeated manipulations, as practised by the osteopath, should be more effective; but Marlin has aptly compared the repetition to the gentle tapping of the old lock, so as to get the key to turn. It *may be mentioned here that* the cracking of joints on manipulation, to which the patient attaches so much importance, can be demonstrated on normal joints. The osteopaths at our visit attached no significance to it, and tried indeed to avoid it.

We also found it difficult to understand why rep
manipulations should be more effective in reduci
subluxation, and we felt that much of the success of
osteopathic technique might be due to the breaking d
of adhesions and the softening of fixed joints and
tissues.

In our opinion *craftsmanship in manipulative* the
is not to be regarded as a major achievement:
therapy is only a minor weapon in the medical a
mentarium. What is far more important is for
osteopath, if he can, to explain in scientific language
pathology of the osteopathic lesion—which rem
somewhat vague and obscure.

Moreover, "the correct use of *manipulation in*
first instance depends on diagnosis" (Mennell 1948).
osteopathy can cure early rheumatoid arthritis, the
course it is essential to be certain that this is the condi
from which the patient is suffering; if lumbar manip
tion can cure constipation, so too can several si
physical methods; if nervy people declare them
able to relax and sleep after manipulative treatm
so can a number after a hot bath. Accounts of succ
cases here and there are not always in them
impressive, "for who will shoot all day without
times hitting the mark?" (Cicero).

THE FUTURE

To label osteopathy as refined quackery—which
medical men do not hesitate to do—is an unw
insult; the osteopaths' premises may be false, bu
are sincere men who feel that they have a missi
perform. They may perhaps be described as sent
talists who, as Oscar Wilde remarked, see an a
value in the worth of an idea. We have to rem
that such vanities are not their sole prerogative
medical vanities are by no means unknown if you
about.

Much of the osteopath's reputation with the pub
this country is, we believe, reflected glory from
skilled "bone-setters" or "manipulators" of the
—household names—who *lived in the days when*
management of bone and soft-tissue injuries was of p
quality. It is not that the medical profession
ignorant of the possibilities of manipulation, bu
were by no means insensible to its dangers. These
setters never preached or believed in osteopathy
present wide, full meaning; but the public, ever cra
for the miraculous or the unorthodox in medicine,
been unable to differentiate between their claims,
has thrust the mantle of honour on a similar resoun
name.

In our view—and we do not claim to an exte
study of *the subject—there is a limited field for* this
of work, but it needs to be winnowed in the tes
ground, indeed battle-field, of the large modern hos
Their claims seem to us extravagant; and it is
that doctors should only slowly weigh the scruples
reasons of any idea—that they continue to be ch
unemotional people. Osteopaths, on the other h
must fill themselves with the spirit of medicine, an
prepared to expose every cranny of their mind.

In no circumstances could the profession yield
stop in its opposition to the non-medical osteopath.
we feel that medically qualified osteopaths should
be *given opportunity* to work and prove their cas
orthopædic departments. They *will find it an exhilarat*
if somewhat trying, process, grinding their wits on
whetstones of others. Time will soon tell what
are "fit to be written but on air, or on the stream
swiftly flows."

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THE KING'S FUND

NEW WORK AND OPPORTUNITIES

the course of his address when presiding over the council of King Edward's Hospital Fund for on Dec. 14 the Duke of Gloucester spoke on aspects of the Fund's work:

People.—There are many people in hospitals, mostly years of age, who need not stay there but who some degree of nursing care and medical supervision. but impossible to secure admission for these people other institution, but they are taking up beds which to be filled by the acute sick. The work of some of orders, and of such voluntary bodies as Mrs. Hill's in Highgate, deserves every encouragement, and if bodies will come into the field and run such the distribution committee will be glad to help them tantial grants.

scent Homes.—There are some 4000 beds in con- homes not included in the National Health Service, of which need both advice and monetary help. The committee are going to recommend that we not only give £30,000 for ordinary grants next year, set aside a sum of £50,000 for special purposes.

ing for Ward Sisters.—We have this year undertaken a staff college for ward sisters—i.e., a residential where would-be ward sisters can spend a term of fifteen weeks. . . . The courses are to be directed to the path of young sisters easier by instructing them stration generally, in personnel management, and These courses should greatly increase their and enable them to discharge their many duties easily and smoothly with a saving of time and with strain. We particularly want to stimulate and sisters to take an active part in the practical of their student nurses and to exercise a closer over their work in the wards. We believe that if be done it will also check some of the wastage during because it will help to do away with the disappoint- and frustration so many nurses feel when they are on as best they can without supervision and advice.

ital Catering.—We plan to establish at St. Pancras now part of University College Hospital, a training for hospital catering. Since 1943 the Fund has been interested in hospital catering and has, I think, been ental in effecting improvements. The old régime of ked meal a day is now a thing of the past. But ole movement is held up, and is indeed in danger backwards, for lack of properly trained caterers personnel. We intend to have at St. Pancras a kitchen, and room for various subsidiary and educa- activities. And we intend, too, to continue to offer isory services on catering which have been a real so many hospitals.

Edward Peacock said that the ordinary income year amounted to £257,000, and legacies received d £93,000. With the sum of £425,000 from the ld Trust for the Special Areas, the total receipts ted to £775,000, against £487,000 in the previous The year had been transitional, and disbursements d £166,000; but the Fund was already committed ner expenditure in various directions.

Harold Wernher indicated that the Fund's activities future be conducted to a large extent on divisional Each division will operate under a budget approved the management committee. Thus, a division of ital facilities has been created of which Captain Stone is director: a nursing division will be lished, directed by Miss Muriel Edwards; and further can be constituted as circumstances require.

a result of these changes, the office of honorary tary will disappear, and a warm tribute was paid the Duke of Gloucester to the work done by the rary secretaries since the establishment of the and particularly to the three now retiring, Sir ld Wernher, Sir Ernest Pooley, and Sir Hugh F.R.C.S. Sir Ernest Pooley will succeed the late Donoughmore as chairman of the management ittee, which will be enlarged and will include Wilson Jameson, F.R.C.P., chief medical officer of Ministry of Health. Sir Archibald Gray, F.R.C.P., become chairman of the distribution committee, and Sir Henry Tidy, F.R.C.P., will remain chairman of the convalescent homes committee. The chairmen of the four Metropolitan regional hospital boards—Mr. Fred Messer, Mr. J. W. Bowen, Mr. K. I. Julian, and Mr. F. H. Elliott—have been appointed to the council of the Fund.

CENTRAL HEALTH SERVICES COUNCIL

ON the recommendation of the Central Health Services Council, which held its third meeting last week, the Minister of Health has decided to set up the following nine standing advisory committees:

Medical
Dental
Pharmaceutical
Ophthalmic
Nursing
Maternity and midwifery
Tuberculosis
Mental health
Cancer and radiotherapy

These committees are to "advise the Minister and the Central Council upon such matters relating to the services with which the committees are concerned as they think fit and upon any questions referred to them by the Minister or Central Council relating to those services."

The Minister proposes that the medical, dental, pharmaceutical, and ophthalmic committees shall be professional in character, while the other committees will include lay members and will review the whole scope of the services in their particular field. It is hoped that all the committees will be constituted very shortly and that they will be able to start work in the New Year.

The Central Health Services Council has decided to set up committees of the council itself:

On *health centres*, "to consider and make recommendations on the lines along which health centres should be developed under section 21 of the National Health Service Act, 1946,"

on *hospital administration*, "to consider the administration and organisation of the hospital services under the National Health Service Act, 1946, and to make recommendations."

Both will include coöpted members. Pending the appointment of secretaries to the individual committees, communications should be sent to the secretary of the Central Health Services Council, Ministry of Health, Whitehall, London, S.W.1.

HALF A CENTURY IN TUBERCULOSIS

SOCIETIES whose titles contain the words "for the Prevention of" must look forward, like Azrael, to a millennium when their work will be done and they can acquiesce in their own extinction. The National Association for the Prevention of Tuberculosis has a better chance than most of fulfilling this honourable death wish, for much progress has been made during the first fifty years of its strenuous and successful life. It was founded in 1898, by King Edward VII, then Prince of Wales; and his successors as president have been King George V, King Edward VIII, the Duke of Kent, and the Duchess of Kent. At the time of its founding there were 36 million people in England, and some 70,000 died that year of tuberculosis. Today the population has risen to 48 million and the tuberculosis deaths are expected to be less than 27,000—still far too many, but only 0·6 per 1000 instead of 2·0. This has meant a saving of 1½ million lives in the fifty years, and N.A.P.T. has played its part in the reduction. It was active for ten years before the first tuberculosis clinic opened in England, and its job was to preach the value of open-air treatment and the preventive approach. In 1912 sanatorium treatment was made the legal right of every insured person, and in 1920 treatment and aftercare became the legal responsibility of the local health authorities. Throughout the years that led to these advances, and since, N.A.P.T. has encouraged and stimulated. It has seen the county tuberculosis schemes and the insurance committees come and go: and now the fiftieth anniversary number of the *N.A.P.T. Bulletin* can state the paradox that, under the National Health Act, voluntary work in tuberculosis has become statutory. What will become of this disease in the next fifty years? Even if the hope of effective antibiotics recedes, the association foresees great changes. If tuberculosis in the temperate zone ceases to be a major problem it will be free to give more attention to those regions of Asia and Africa which so greatly need it.

In England Now

A Running Commentary by Peripatetic Correspondents

My chief memory of early childhood is of waking up on Christmas morning and diving for the stocking at the foot of the bed. The first thing was to feel it over quickly, starting at the toe. Yes, there they were, the two round balls denoting an apple and an orange. Thus reassured I would palpate the rest at greater leisure. Of course it was never quite the same after the incautious entry of my father, stocking in hand, one Christmas Eve. But luckily nothing seems to shake my own children's belief in Father Christmas. Indeed it has been greatly strengthened by our new nanny, who encourages a brisk, if one-sided, correspondence with him. (At other seasons she promotes an equally lively correspondence with the fairies in our garden. She has even picked an answer out of the gooseberry bushes.)

Choosing presents is a ticklish job. For the two girls it is easy: we get what we think they should like, and then persuade them that these are what they thought of asking Father Christmas for. With my three-year-old son it is different. This year we got him a large engine, but when we got to work on him all he would say was "bus." No persuasion, and no tactful deferment of the topic, has moved him. In honeyed tones I came back to it when his mouth was full of a pudding he thinks rather well of; but he took time enough off to look up and spit "bus" at me. We even wrote "engine" in his personal letter to Santa Claus; but the boy didn't take the hint as he's more or less illiterate. So he's going to have an engine *and* a bus.

When it comes to presents between my missus and myself it is easier. You just think of the thing you yourself want most, and then give it with some casual word such as "I know you've always denied yourself this, dear." I happen to know that this year I am to receive a pressure cooker.

* * *

Just one more letter illustrating the perils of translation. This one comes from a former syce who sought re-engagement with the Artillery.

> Sir,—Your humble petitioner is a poor man in agricultural behaviour and much depends on season for staff of life. Therefore he throws himself upon his families bended knees and begs of merciful commiseration. Your humble petitioner was too ill last rains and was taking vernacular medicines which made great excavations in coffers of your humble servant. That poor humble servant has large family of seven livers, two male and five females, last of whom is milking his parental mother and another birth coming through grace of God to second wife of bosom. Therefore he prays that if there is place ever so small in the backside of the honourable battery, this humble slave be allowed to creep in, for which benevolence your humble servant will as in duty bound ever pray for your long life and prosperity.

* * *

Walking back to my home one night I was attracted to a small crowd gathered round the railings surrounding a church. The cause of the trouble was a small boy who, playing within, had pushed his head out through the bars and was now unable to withdraw same. A well-meaning bespectacled gentleman was unsuccessfully applying pressure, but this was not at all appreciated by the subject, and a disreputable old woman was making unintelligible although obviously protesting noises. The man next tried manual rotation to disentangle the ears but this also proved ineffectual and only caused the old woman to cry "Ugh! Ugh! Arrh! Um! Arr! Hoch!" still more. Thereupon the man, emulating Samson at Gaza, wrenched laterally at the unyielding railings while pushing against the head with his stomach. At this point, as I turned my gaze once more on the weird female who had become more vocal and incoherent than ever, and the doctor in me was insisting that I must step in and do something, I was relieved to observe the approach of a policeman, for in the presence of the law my conscience allows me to maintain my anon in the face of street incidents and such.

Even the old lady and the small boy himself silenced as the policeman broke through the circle. advanced to the railings and, securing a foothold, j himself over, when he immediately lifted the ch the legs, rotated the shoulders into the vertical posi and simply thrust the body through the gap after head. As the tear-begrimed urchin picked up his cap scuttled off home the old lady's face was a pic it expressed not relief or pleasure but uncon triumph. Though she could not make it clear in w her face plainly indicated that she was saying "I you so," and what fools we all were in ignoring advice. I returned to my flat feeling I had receiv valuable tutorial in obstetrics.

* * *

I keep these directions, taken from a New Z women's magazine, by me to browse on from time to t

> Here is your breathing exercise. It isn't necessary to before an open window to do it, but stand against a opposite an open window. Throw the shoulders back. cough breathily and press either hand on to the bott your lungs—you'll feel them coming to a point—make c that they are emptied and the entire lung what is techni called collapsed, when it will seem to hang inside your n
>
> Then start to breathe in. Keep the shoulders bac down, but do not let them rise. Stiffen the muscle b the lower end of your lungs—the diaphragm. This wi the lungs out like bags. Fill lungs from the bottor and when the top is full, empty them from the botto still keeping the diaphragm stiff, so that they stay h like bags. It is not easy to do. It is even very exha *But you will hear the blood sing in your ears,* showin circulation has buzzed up.
>
> Breathe like this at least ten times.

"*Ten times?*" If I kept my lungs held ou bags even once I am afraid it would be a hymn that the blood would sing in my ears, and a fu hymn at that.

* * *

"Spiv!" he cried, as my friend and I stopped a crossroads on this lovely winter Saturday aften I looked to see to whom the young man referred alas! it was myself. My handsome friend prob had something to do with it, for our eleven years of working companionship, during which we have journ 15,000 miles together every year, have hardly ma my faithful Bentley. But I doubt whether this y "sportsman," off on his weekend pleasures, would thought himself a spiv if he had done my week's wo

On Monday I spent part of the day at a minis committee in London, but managed to get back n 200 miles in time for what should have been an dinner medical staff committee meeting. Two later, after coffee and sandwiches, I started work my dictaphone, and I tumbled into bed well after night. On Tuesday from 9 o'clock I had ward ro then after 20 minutes for lunch there were outpat until 5, followed by a hospital subcommittee for an and a half and the tail end of a staff conferenc another hour. Three-quarters of an hour for d brought me to another medical staff committee foll by more writing and bed at 1 o'clock. On Wedne I operated from 9 until 1.30, was fortunate in ge three-quarters of an hour for lunch, saw patients 6, wrote letters until 7.30, and after dinner did o hor till midnight. On Thursday morning I operated 12.45 and then had a fruitless interview with an inc tax inspector who has decided to charge me tax or expenses paid out of my own pocket for a purely fessional journey abroad. I had 15 minutes for l and the rest of the day was like Wednesday. On Fr I operated from 9 until 11.30 and did administra chores until 12, when I started for the regional h quarters 80 miles away. After a four-hour committ returned home for dinner at 8.30, and then mot 40 miles to the hospital in which I worked today.

when accosted, I was on my way to treat a 's ailing wife, and now at 6 o'clock I am back home desk to which I must bind myself until midnight to satisfy my publishers who are clamouring for ." Tomorrow I shall be lazy and start work at before lunch I must see problem cases in the and must visit another centre 16 miles away. ernoon may be my own but the evening won't be. "—one who exists on other people's efforts? perhaps I am. At two N.H.S. committees that this week the minutes and relative documents 155 sheets, mostly foolscap, of which no less 44 were mimeographed on one side of the paper It's enough to give you a pain in the neck. Neck? that's it. My neck *is* stiff and I suppose the exotic I was wearing seemed as revealing to that young a notice saying SPIV on the windscreen.

* * *

Every woman by whom or on whose behalf a claim maternity benefit is made shall furnish evidence that has been, or that it is to be expected that she will be, by means of a certificate given in accordance the rules set out in Part II of the said Schedule . . ."

Instruments, 1948, no. 1175, para. 2.

new method of midwifery is included in *The Gynæcology*, to be issued by the Stationery Office, be wise to order your copy now. It sounds jolly easy way of earning your £4 14*s*. 6*d*.

* * *

my house in order, to receive a locum the other I fell to musing on my own locum days. There was ly early one, when I could scarcely drive a car. ed late at night, and the kindly doctor promised lesson before he went off to his camp in the morning. 5 A.M. a confinement call came from a distant He drove me there, muttering instructions; we arrived it proved to be a primip., half full, too slowly for him to stay and too fast for me

promised to have the car left ready for me and with a rather apprehensive blessing. After a period of inertia, the patient delivered herself M. Triumphant and exhausted, I emerged into car and pushed the starter button. Nothing for ten minutes, except that all the village ered round; then I remembered to switch the on. After a perilous journey I got back for a and a meal, and then thought I'd better practise in a nearby lane. I was doing fine when there bump and the car ceased to move. I'd reversed a ditch, in which the back wheels were revolving; it took a crane to haul me out. After that my improved; the doctor's wife used to come out , and I could never understand why she clutched every time we went round a corner.

er memorable locum was in a heavenly village, queer bloke. Before departing he warned me fraternising with his wealthier patients. He been gone two hours when the local squire's dislocated her shoulder. I was lucky to get it easily, and as her parents were disproportionately I had a royal time with them. They were dears; had been married before, and as they sat at each of the table he would begin "My first wife used to . .", to which she would counter "Now *my* first . . ." most amicable fashion. In this practice, not 80 from London, I met an old coachman who still his long hair in a plait, neatly coiled round the top head.

there was that leisurely locum in the Middle , where I cooked for myself and lived largely on eggs and Bel Paese Cheese, and learned to love old buildings, the plane trees, and the pigeons. that suburb, where, on a first view of its drab streets ugly houses, I *swore* I'd *never* live for gold untold. I've been here 16 years now; either it wasn't as as I thought or my exquisite sensibility has been . Perhaps a little of each.

This is the tale of DOCTOR GRIST,
Who trained as a Psychiatrist.
A meek and harmless man, he had
No urge to Cure the Almost Mad,
No flair for Certifying Earls
Or Tête-à-têtes with Nervous Girls:
Being quiet, cleanly and observant
He yearned to be a Civil Servant.
One day he spotted in the Press
A notice: "Motor Licenses
Require at Once, Psychiatrist,
(Grade A) With D.P.M.—Assist
Urgent Research—No Private Ties.
All Canvassing Disqualifies."
So ran the notice in the L****T
And DOCTOR GRIST resolved to chance it.

You've doubtless noted with a grin
A Bentley labelled B.I.N.
Or FUN inscribed upon a hearse,
And looked in vain for Something Worse.
Our subject, when he took the plunge,
Found that his Task was to Expunge
From Lists of Motor Registrations
The More Indecent Combinations.
He had a room in Birdcage Walk,
A table and a large blue chalk,
And day by day he scanned the list
For Dirty Words which had been Missed.
"We must be careful" said his Chief—
"The Unconscious Mind is Past Belief.
A motorist might well repine
To be inscribed BUM 99—
To stop such things from getting through,
We need a well-trained man like you."

He had not been at work a week
Before the colour left his cheek.
A fortnight saw him growing thinner—
He had no Appetite for Dinner.
Being a Conscientious Man
In every list he had to scan
He toiled and laboured to divine
Where Censorship should Draw the Line.
And Day by Day the Menace grew—
"Oh, what if I should Let One Through?
The simplest labourer would agree
We must dispense with * * *,
Now HOG and CAD are not obscene,
And yet—you gather what I mean?
The Thing's Impossible to Define:
Have Other People minds like mine?"
As week by week his weight declined
He wrestled with the Unconscious Mind:
He shunned companions, got no sleep—
The letters, like unruly sheep
Ran through his head in groups of three.
He said "What will Become of Me?"
He found he could no longer meet
The eyes of urchins in the street
And even Trivial Phrases bore
Meanings they Never Had Before.
He formed the idea that Men in Black
Were Chalking Things upon his Back,
Was ambushed out of Garden Gates
By Jesuit Priests on Roller Skates:
And when his Chief informed him: "You
Will note that as from '52
The letters will increase to FOUR,"
He bit a large piece from the door.

They fetched a new psychiatrist
Who soon obtained for DOCTOR GRIST
A plain van, marked appropriately
Before and after, M.A.D.

Moral

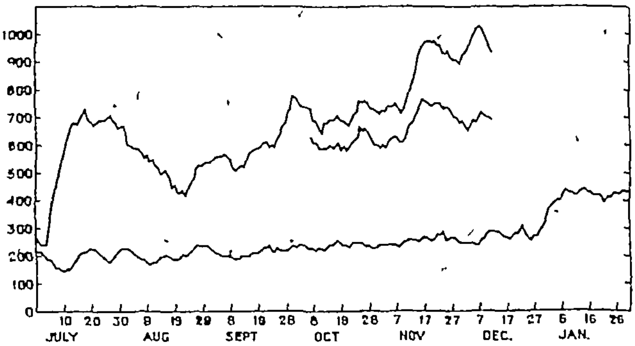
Learn from our hero's fate to shun
The Censorship of Harmless Fun.
Avoid the Habits of the Prude,
Don't live to hunt for What is Lewd
By Mrs. Grundy or by Freud,
Or you will End Up Paranoid.
But, if you're a psychiatrist,
Enjoy the Cracks the Censor Missed.

Letters to the Editor

NO ROOM AT THE HOSPITAL

SIR,—Having read last week's leading article, I think you may be interested in the accompanying chart of the work of the Emergency Bed Service.

The graph is made by plotting daily the total number of cases for the preceding seven days. (This is done in order to smooth out the great variations which occur from day to day.) The top line shows the number of applications received for all cases other than infectious diseases. The middle line shows the actual admissions of such cases. The bottom line shows all applications (again excluding infectious diseases) in 1947. It will be observed that not only is the top line rising more steeply than in 1947, but that the applications are about three times as numerous. While the applications are still rising, the admissions remain at about 700. By the time just over 100 cases have been admitted on any day the hospitals can take no more. If, therefore, the applications rise steeply after Christmas, as is to be expected from the trend of the graph last January, a very serious situation will arise.



The use of the Emergency Bed Service by doctors is purely optional; there is nothing to prevent a direct approach to the hospitals. In this respect the service was unaffected by the appointed day. Why then did the number of applications increase so greatly on July 5? There can be no definite and simple answer to this question, but it seems probable that many hospitals decided that after the appointed day they would treat their nurses fairly and stop overcrowding. It is difficult to quarrel with this attitude, but the net result is a reduction in the number of patients who can be admitted to hospital and in consequence a reduction in our power to assist doctors. The cases now refused admission are mainly those which are, or might become, chronic, and which need urgent admission owing to an exacerbation of their condition; but already difficulties have arisen in other directions, notably babies requiring medical treatment. It must be borne in mind that not all the patients whom the service failed to admit should have been admitted. About 10% of all applications are unsuitable for admission, either because they can be sent to outpatient departments or nursed at home, or because they belong to categories which the service does not deal with—e.g., mental.

The task of the Emergency Bed Service is to admit patients to such beds as are available: it cannot create vacant beds. In consequence, however hard we try, our power to assist doctors is limited by circumstances over which we have no control. The service does its utmost to find beds for urgent cases, and will continue to do so; but doctors will greatly help if they will, whenever possible, make use of all the domiciliary services provided by the local health authorities or voluntary bodies, so that the patient may stay at home instead of going into hospital.

Emergency Bed Service, 10, Old Jewry,
London, E.C.2.

R. E. PEERS
Secretary.

SIR,—Your thoughtful leader on this urgent subject made me wonder whether there was any remedy for the immediate danger other than those you mention: I doubt if there is. Jeremiads on the shortage of beds and of nurses are of little avail—it will not be po to build large hospital extensions for many years, as was shown in a recent debate in the House of I never has the number of nurses available been so l

There is, however, a long-term policy which coul energetically carried out, go a long way towards venting a recurrence of the present difficulty, espec for elderly patients. Pioneer work carried out at a number of large hospitals has shown that 15% or of the so-called chronically sick, the majority of w are elderly, can be so remedied as to be able eith *return to their own home or to be admitted into* a munal home: by energetic treatment one large h has been able during the past twelve years to the number of beds required for its chronic sick 700 to something over 200. If this enlightened were to spread over the whole country a large propo of the present shortage of beds would disappear.

The provision of communal homes for elderly pe who are unable to return to their own homes, but no longer need costly hospital treatment, is an u necessity: until they exist, in large numbers, in tion with the general hospitals, the general freein hospital beds cannot occur. But this provision is now duty of the local authority under the National Assis Act, and the presence of a dangerous administrative between the regional hospital boards and the l authorities is already making itself felt: as you l pointed out, Sir, the margin between health and ill he in the elderly is narrow. The establishment of statu committees comprising members of the boards, l authorities, and voluntary bodies would enable ho to be set up in close association with the hospitals, this would lead to a great number of beds being f for the sick, both young and old.

London, S.W.3.

AMULRE

THE UNIVERSITIES AND THE HEALTH SERV

SIR,—The payment of consultants for hospital w and the disappearance of much of the competitive gan of private consultant practice, combine to enda the future usefulness of academic clinical posts.

It is well to remember that whole-time chairs lectureships in the clinical field were rarities twe five years ago. Such posts were created in the hop encouraging those who wished to escape from the he scramble of consultant work to devote time, thou and experiment to clinical problems. Whatever ho for the future progress of medicine the creation of su posts may have raised or indeed fulfilled, the prospe now are gloomy. Recruitment to junior posts is at moment easy for the universities, which have a v pool of "medical under-employed" to draw upon. price they have to pay is low. This position will se change. Hitherto the tendency has been to app from a plethora of candidates those with the m distinguished record of original research. This pol has caused a gulf to open between the academic and vocational sides of medicine which I venture to sugg will grow wider and will not, as long as academic cl ni departments are responsible for undergraduate teachi be good for the growth of medicine in this count The first two dangers are, therefore, both a quantitat and a qualitative failure of recruitment to clini university posts.

The third danger, mentioned by Prof. Dible, in article of Nov. 27, was some months ago thrown i dramatic relief by a B.B.C. broadcast in the "I fessional Portrait" series. This danger is that profess will be swamped by administrative work.

The fourth danger is imminent. Because of the l salaries junior academic appointments will come to looked upon as stepping-stones to consultant pos which today have many financial attractions, and t possibility of just as much leisure for thought a research as is now given to the clinician or patholog employed by a university. If this fear is justified events, professors will have to cope with a stream ever-changing juniors. This cannot be good for morale of any department.

There seem to be two alternatives for the futu The first is to abandon the present system of who time university clinical appointments, and to rove purposes of undergraduate teaching, to the old university chair, with, in parallel, an independent of clinical research, which would be fed from hospital but lie outside its main structure. in the sphere of postgraduate education. The alternative is to set our present house in order following measures:

the regional interests of the universities be cared a medical administrator instructed by the faculty. academic workers be discouraged from committee concerned with regional responsibilities.

the clinical work of university staffs to be con- at one or other end of the week, so that whole days be set aside for research. This is very important since engaged in clinical work never know the freedom of in which to pursue their own studies.

Raise the salaries of academic hospital workers by them to enter into contracts with their hospital for such clinical sessions as they normally hold. Such would tend to attract and keep the best, thus continuity in clinical departments.

g the many controversial issues already raised letter I expect that those under (3) above are to most criticism. Why should the clinicians be more than other university workers? The argu- in favour of such a course should be appraised from des. First, would they be paid more? Workers faculties often have sources of income beyond salaries, for in practice no objection is raised ersity employees offering advice or services to and Government departments and to their being such services. Broadcasting and writing bring to the more senior members of other faculties. widespread coaching system helps the junior rs. Time for such extramural activity is provided long vacations, free from the burden of teaching such routine work as is the daily responsibility icians. Secondly, the clinician employed by a who does, if anything, more teaching in a year workers in other faculties, is surely entitled to for work done on behalf of the National Health . Since he must do clinical work to maintain proficiency as teacher and research-worker, such cannot be considered as contrary to the interests university which employs him. The principle of nt for work done has been completely accepted National Health Service Act: so there should be ffiulty from that quarter.

am well aware that many of these controversial ons must now be under consideration by those nsible for policy: but I hope, Sir, that you will that the expression of every point of view is ble.

rtment of Medicine, Bristol University. J. NAISH.

A NEW TYPE OF READING-LENS

—It is well known that many people of advanced experience difficulty in reading small print, even equipped with reading-glasses otherwise suited to refraction of their eyes, as has happened to me on old.

On consulting eye specialists to fill this want I was that reading-glasses which could remedy this were obtainable. About 1½ years ago I tried to get this difficulty for myself by fixing a lens (6½ es), connected with a head-band, about 30 cm. the eye. Since then Messrs. Simonsen and Weel, Copenhagen, have constructed for me a satisfactory -lens, which they describe as follows:

"Reading-lens *mounted on a* specially constructed pport (fine *wire stand*, *which is fixed* to a head-band. It differs in part*icular from other reading* lenses or magnifying glasses in that *this model can be fixed* on the forehead suitable *distance from the eyes, leaving* both hands free during reading."

additional *advantage is that it* is unnecessary to ove the band *from the head if one is* moving around looking for *something else in the room*. Further, lens is fixed *so far from mouth and* nose that it not become *dimmed by breathing*. With this lens it possible *to read for many hours at a stretch* without ting tired. I *also believe it may save* old people from having frequently to change their reading-glasse for others of increased strength, but one should consul an eye specialist when adopting this model.

I want to improve the device by having the len shaped wider and oval. The one I have is circula 6 cm. in diameter. To obtain a wider field of vision i would have been better to make the lens 8 cm. wide and, in view of the weight, to reduce its height. I also recommend the use of a more powerful lens. I believe one of 8–10 dioptres would be best. The firm over here has ordered such a lens *from a factory* in England but has been told that for the present delivery is *impossible, owing to* power. It is hoped that this will be ren

This type of lens will be useful not on who have difficulty in reading but also to peop handle small delicate objects (botanists, zoologists, watchmakers, &c.), since it will leave their hands free for working.

Kongens Lyngby, Denmark. JOHAN LEMCHE.

PATHOGENESIS OF THE ACUTE EXANTHEMS

SIR,—Dr. Fenner's article of Dec. 11 records an admirable piece of work and an important addition to our factual knowledge. His conclusions with regard to the allergic nature of exanthematous skin eruptions, however, betray a confusion too dangerous to go uncontradicted.

Whether we adhere to von Pirquet's original and cautious definition of allergy as a state of altered reactivity (*veränderte Reaktionsfähigkeit*) or accept Rich's more circumscribed concept of an intracellular antigen-antibody reaction, the evidence brought forward by Fenner serves in no way to weaken the case for the allergic nature of the exanthematous rash.

On the 7th day after inoculation Fenner noticed the first clinical change at the primary site, which he describes as œdema. On the other hand, in the skin remote from the point of inoculation, a maculopapular rash appeared 3 days after the first appearance in it of the virus. This different behaviour both in time-relation and in the nature of the lesion means that either the skin or the virus must have changed in their reactivity. Since the latter possibility is easily excluded (by transmission) the explanation is apparently an altered reactivity of the skin.

He found virus in the blood-stream on the 4th day, but in the skin not until the 6th day after inoculation. This also argues an alteration in the reactivity of the skin, enabling it to fix circulating virus.

Fenner obtained evidence of skin sensitisation to the virus on and after the 7th day. He has demonstrated the presence of large amounts of virus in the skin. And yet he concludes that the eruption on the 9th day—i.e., in a sensitised organ and in the presence of the sensitising agent—is *not* an allergic phenomenon. Perhaps the presence of virus in the skin-lesions accounts for this confusion, Dr. Fenner having apparently transferred the concepts of bacterial allergy into the field of virus diseases without making the adjustments necessitated by the differences which separate most viruses from most bacteria.

It may be taken as axiomatic that antigen must be present for the initiation of acquired antibody formation. Many bacteria liberate diffusible substances which act as antigens; so both circulating and fixed antibodies can be formed in tissues remote from the invading bacterium. Viruses do not liberate diffusible antigens but are themselves antigens, and their actual presence in the tissue is therefore a conditio sine qua non of antibody formation. To see in their presence in any lesion an argument against the allergic nature of that lesion is to ignore this fundamental fact. Even in bacterial diseases the presence of the causal organism in a lesion is in itself no criterion for or against the allergic nature of that lesion (e.g., leprosy). We can however postulate that in virus infection an allergic state cannot arise without the actual presence of the virus in the tissue concerned. The factual findings of Fenner are in accordance with this view.

It is significant that in Fenner's chart the curve for antibody titre shows, in its ascending limb a close correspondence in time with the curve for the virus content of the skin. The interpretation of this would seem to be that *in exanthemata the skin is a most important organ of immunity.* The presence of virus in it induces the formation of antibody both free and fixed, so a state of rising immunity and allergy coexist. The latter enables the skin to filter off circulating virus and *to fix it. The allergic reaction destroys the skin,* [illegible] is shed and replaced by fresh epidermis. This [illegible]xample of an allergic reaction which, although [illegible]tal to the affected organ, is of value to the in order [illegible]as a whole. Coexistence of allergy and occur from [illegible] of course a well-known phenomenon, of applications [illegible]berculosis. diseases. The [illegible] of the skin as the most active organ of of such cas[illegible]anthemata and of the eruption as the allergic [illegible] *this defence action is in agreement with the* experience of physicians of all ages who have seen in a florid rash a good prognosticon, and have looked with anxiety upon cases in which the typical eruption was tardy to appear. Conversely we may see in the purpuric forms of the exanthemata conditions in which the skin fails to get beyond the allergic state, with a correspondingly grave prognosis.

Dr. Fenner says that "the symptoms and signs develop only when multiplication of the virus has almost reached a maximum." Possibly it would be more correct to say that the multiplication of the virus is halted soon after signs and symptoms appear because these signs and symptoms are the allergic expression of developing immunity. *The idea that the lesions of* infective diseases are simply due to the multiplication of the infecting organism is as moribund as the unfortunates to whom *it applies. It is our reaction to the* presence of the organism, not their presence itself, which *is responsible for the signs and symptoms.* Fenner has demonstrated that the skin lesions of mousepox contain virus; he has not demonstrated the nature of the reactions responsible for these lesions.

Usher Institute,
University of Edinburgh.

ERICH GEIRINGER.

INDEPENDENCE IN RESEARCH

SIR,—In his letter of Dec. 11 Dr. Waddington disagrees with my criticism of the Russian scientist, Lysenko. My objection was chiefly to the political control exercised by the Kremlin on scientific research in Soviet Russia. It is curious how closely Russia has copied the Nazi model. Early in the Hitler régime very similar activities to those of Moscow became apparent. I append some authentic statements bearing this out:

The leader of the Reich doctors, at a congress in [illegible]35, declared: "If we intend to establish [illegible] today *the basis of this science can* [illegible] science but only our National Socialist [illegible] living." In 1934: "It is the task of our National [illegible] welfare doctors to help enlighten the whole nation [illegible] to think racially, sociologically and politically." And [illegible]: "There is no room among the panel doctors for politically unreliable elements."

"The new medical curriculum comes into force on April 1, 1939. It introduces a curtailment of the medical course by nearly two years."

In an address at Heidelberg University in 1938, a professor said: "There is no such thing as international science: there is only German science, and German science

It so happens that a report has been published (*Li* Dec. 9) of four broadcasts in a recent symposiu Lysenko's activities. Three of the four scientist fellows of the Royal Society) taking part exp the most devastating condemnation of Lysenko scientist. The fourth speaker, Prof. J. B. S. Hal is a professed Communist. His defence of Ly is clearly an embarrassment to him, and his contrib might well be characterised as damning with praise.

House of Commons.

E. GRAHAM-LIT

CONTRACEPTION IN GERMANY

SIR,—Legally the present position in Germa as Dr. Sandler outlined it on Dec. 4, but in practice is little doubt that efforts by the German public-h authorities to establish birth-control and mar guidance clinics would receive sympathetic consider from the authorities.

This organisation, set up as the result of the I national Congress on Population and World Res in Relation to the Family—which was attended German delegation—is maintaining contact with Ge doctors who are anxious to resume family planning *and it is hoped that clinics will be opened before* long as part of the fight against illegal abortion an sale of inferior contraceptives, so prevalent in Ger today.

Family Planning Association,
69, Eccleston Square, London, S.W.1

HELEN DON
International Soc

Parliament

QUESTION TIME

Cost of N.H.S.

Colonel M. STODDART-SCOTT asked the Minister what su have been paid out of public funds since July 5, 1948, in re of hospital services, general medical services, pharmac services, general dental services, and ophthalmic ser and approximately what proportions these sums rep of the total liability incurred.—Mr. BEVAN replied: total amounts paid out of public funds since July 5, and up to Nov. 30, 1948, are as follow:

	£
Hospital services	58,000,000
General medical services	7,982,994
Pharmaceutical services	5,438,1
General dental services	5,541,
Ophthalmic services	4,017,

The total liability incurred in that period cannot be stat

Sir HUGH LUCAS-TOOTH asked the Minister what sum been paid out of public funds in respect of hospital se under the National Health scheme.—Mr. BEVAN re Up to Nov. 30 a total of £58,000,000 had been paid department in respect of hospital services in Engla *Wales since July 5 last. Sir H. LUCAS-TOOTH:* Wi Minister say how that compares with the estimate whether it represents the total liability, or whether fu sums have to be paid in respect of liability already inc —Mr. BEVAN: No, Sir, because it is not possible a moment to carve up the estimates. Very many of demands are still being examined.

Doctors' Pay

Sir ERNEST GRAHAM-LITTLE asked the Minister if h aware that under the present statutory limitations a practitioner's income could not exceed £3600 per gross, whereas that of a dental practitioner could reach per annum gross; and if, in view of the fact that the of professional training for the qualifying diploma in me was 57 months, while the period of training for the d qualifying diploma was 48 months, he would review position, which was causing dissatisfaction amongst me practitioners.—Mr. BEVAN replied: I cannot accept of the implications in this question, but *I am about to* the present scale of dental fees in consultation wi